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COMMENTARY

Roberts v. Sears: A new test of patentability?

From time to time, sufficient confusion exists among or within the Federal Circuits, as to the interpretation of the patent laws, to warrant Supreme Court judicial review. Such is the case presently in the Seventh Circuit, as evidenced by a January 14, 1983 decision in that circuit, *Roberts v. Sears,* 697 F.2d 796 (7th Cir. 1983).

Briefly, the invention in *Roberts v. Sears* concerns a novel way to remove interchangable sockets from a quick release socket wrench. A push-button release system was developed and patented by the plaintiff-appellee, Peter Roberts, and sold extensively by the defendant-appellant, Sears, Roebuck and Company. The district court found the patent valid and infringed and awarded Roberts $5 million in damages (later raised to more than $8 million); however, the Court of Appeals for the Seventh Circuit reversed the district court decision and found the patent invalid, in the words of Judge Posner, " . . . because we think it would have been made anyway, and soon."

The basic premise promulgated by the *Roberts v. Sears* decision is that patents, due to their monopolistic nature, are contrary to public policy and therefore should not be upheld except for the rarest of inventions. Attempting to re-interpret the intention of the patent laws, *in toto,* and thus rationalize the finding of patent invalidity, Judge Posner contends that:

> A patent confers a monopoly over the products in which the patented idea is embodied, and monopoly, among its other effects, results in a lower output of the monopolized product, and so reduces consumer welfare. The framers of the Constitution and the Patent Code would not have wanted patents to be granted where the invention would have been made anyway, and about as soon, without any hope of patent protection.

Thus, the Seventh Circuit proposes a new test of patentability: undesirability. Where sufficient need exists in a society to promote one or more inventors to develop a new and useful discovery, the Seventh Circuit suggests that the mere allegation that a non-existent person might not avail himself of patent protection warrants the removal of such protection from all seekers. Such unfounded and circular reasoning is not commonly found in the interpretations of the patent laws.

Judge Giles S. Rich of the new Court of Appeals for the Federal Circuit, a noted authority on patent law and one of the authors of the

Patent Act of 1952, warns about the well-intentioned but not too well-informed people who argue against the concept of monopolies, *per se,* due to the possible dangers inherent in an abuse of a monopoly. (See "The Vague Concept of 'Invention' as Replaced by Sec. 103 of the 1952 Patent Act" by Giles S. Rich, 46 J.P.O.S. 855 (1964), reprinted with corrections from "IDEA" Conference Number 1964, page 136.) Judge Rich goes on to explain in his often cited article that other property rights convey a limited monopoly without invoking judicial wrath and misunderstanding but the spectre of the ill-used monopoly is commonly, though often inappropriately, raised in regards to the protection of intellectual or industrial property.

The Patent Act of 1952 removed the evanescent requirement of "invention" as a prerequisite for the grant of patent protection, and in its place included the standard of non-obviousness as the counterpart to the well accepted novelty requirement. The test for obviousness to preclude patentability, as set out in 35 U.S.C. §103, states only that " . . . the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art . . . ."

In discussing obviousness, Judge Posner attempts to cast doubt upon the Roberts patent in that the essential elements that would make up an effective quick release socket wrench were known. The reason that no protection should be given, according to Posner, is that "[i]t was just a question of coming up with a workable embodiment of these ideas." Yet, such is the scope and content of a large portion of the patents existent: the effective and novel embodiment of well known elements to create a useful result. Had Alexander Graham Bell been before the Posner court, one can only surmise from the rationale of *Roberts v. Sears* that he too would have been found not worthy of patent protection for his invention of the telephone. The elements of electricity, conductive and insulating materials, magnets, et cetera, were all well known, and since Bell's "invention" was a mere embodiment of these elements to provide a novel way for sound to be passed along electric wires (a well known concept since the telegraph) the Posner court would most likely have found that granting patent protection to the invention of the telephone also " . . . would overcompensate the inventor . . . [for] . . . the making of minor improvements and impose unnecessary costs of monopoly on the community." As to the need for such a device or its timely discovery, one must again turn to the new Posner threshold standards. Since other inventors *may* have invented the telephone at about the same time as did Alexander Graham Bell (and at least one did!) and may not have been rewarded with, nor de-

sired, patent protection (a judicially construed and unsupported hypothesis), no protection should have been granted to *any* inventor.

What effect will be created by this reversal of the long accepted belief that patent protection as a reward for invention *promotes* further inventive diligence? Judge Posner suggests that no lack of incentive will result, only a wider scope of publicly owned inventions. The *Roberts v. Sears* court admits to the existence of an invention in the quick release socket wrench, yet removes the inventor's protective rights because " . . . it was entitled to patent protection only if it was the kind of contribution unlikely to be induced except by the promise of a monopoly, and we do not think it was that kind of invention because we think it would have been made anyway, and soon." Woe to all inventors if such an unfounded and subjective definition remains as a threshold test for patentability.

Without extensive discussion, doubt can immediately be cast upon the notion that inventors will create and disclose discoveries without the incentive provided by a possible reward of granted property rights to the invention. The concept of providing patent protection, as incentive, is defined in Article I of the United States Constitution: "To promote the progress of science and useful arts . . . ." As far back as 1594, protection was given to Galileo for his inventions by the government of Venice, in that it was unreasonable to require that after creation, an invention would become public property. Yet if granted the privilege of temporary, exclusive rights to his inventions Galileo promised he would be more inclined to " . . . attentively apply [himself] to new inventions for universal benefit." (See "The Vague Concept of 'Invention' as replaced by Sec. 103 of the 1952 Patent Act", *id* at page 857.)

The Seventh Circuit has attempted to remove the last vestiges of the objective standards for patentability promulgated by the patent laws and specifically the Patent Act of 1952, by attempting to return again to the subjective notions of "invention" and extending even to determining the desired *intent* of the inventor. Open publication of discoveries and delayed transferral to the public of useful ideas may become a rarity should the Supreme Court not review the *Roberts v. Sears* decision. Should the Posner standard of patentability remain law, one can only imagine new inventors jealously guarding their inventions behind the cloak of trade secrets while the unbridled spectre of industrial espionage attempts to pry loose these valuable yet unprotected discoveries from their creators.

Michael David Rostoker
Juris Doctor Candidate
Franklin Pierce Law Center, 1984

Recent Developments

I. Criteria for Patentability — Ivory Tower versus Reality
II. Inventorship Problems Don't Go Away
III. "Small Entity" Status
IV. MOSITA and More
V. File Wrapper Continuing (FWC) Procedure

I.

As many other chemical specialties, practice regarding dyestuffs has developed its own set of peculiarities over a considerable period of time. Some inroads were made in the past with decisions like *In re Riat,* 140 USPQ 471 (C.C.P.A. 1964), and *In re Harnisch,* 206 USPQ 300 (C.C.P.A. 1980), while the effect of opinions like *In re de Montmollin,* 145 USPQ 416 (C.C.P.A. 1965) has been subject to some serious challenge. An interesting case in this field [*In re Zeidler,* 215 USPQ 490 (C.C.P.A. 1982)], was reported in the *Weekly Advance Sheets* of November 8.

The patentability of two claims, 8 and 9 (each directed to a specific dye) was involved. The two dyes were trisazo dyes in which phenyl rings of a tetraazo component were bridged by a sulfonamino group. The PTO relied upon three references:

A. disclosed trisazo dyes in which phenyl rings of the tetraazo component were either directly linked or were joined by any one of twelve bridging members, including a sulfur bridge, a sulfonamino bridge and a carbonamino bridge;

B. disclosed green trisazo dyes, including one which was identical to that of Appellant's claim 9 except for the fact that the sulfonamino bridge of claim 9 was replaced by a sulfur bridge; and

C. disclosed dyes generic to both of those claimed except for having a carbonamino bridge in place of the sulfonamino bridge of the claimed dyes.

The Board of Appeals recognized the noted differences between the reference dyes and those claimed. Since reference A taught the interchangeability of the sulfonamino and carbonamino bridges, the Board concluded that the dye of claim 8 was prima facie obvious. Comparative test data had been provided to establish patentable distinction over applied art. The closest counterparts of reference C were compared with dyes of claims 8 and 9, respectively. Each dye was tested for

water solubility, dyeing of chrome side leather and retanned chrome side leather, and wash fastness. The claimed dyes had significantly greater water solubility than their reference counterparts. A Declarant pointed out that the claimed dyes have surprising advantages in the dyeing of retanned chrome leather and in wash fastness. The significance of the improved properties was also explained in a Declaration.

With regard to claim 8, the Board stated:

> While the minor differences in results demonstrated in the Declarations are not expressly spelled out in the references, it would be somewhat unexpected not to experience some differences in degree at least when a structural change is made to a basic molecular configuration. We therefore think it appropriate to insist upon a more dramatic difference in results where, as here, the showings are limited as to the number of properties tested.

The Declarant had stated that "the differences in the wash fastness between the new and the known dyes are extreme; in fact, the differences are as big as that between usefulness and uselessness." The Declarations also stated that the claimed dyes have a much higher water solubility than the prior art dyes and that such a characteristic is desirable as such dyes will better color chrome side leather. Because dyes with lower water solubility are generally more suitable for dyeing retanned chrome side leather, the Declarant stated that he was surprised that the claimed compounds also dyed retanned chrome side leather better than the prior art dyes; the result was not what, as an expert, he would have expected. Although perception of color may, in essence, be a "subjective" determination, the Court believed that an expert's evaluation in this field is entitled to more weight than that of a layman. In view of the fact that the Declarant's qualifications and test procedures were unchallenged, the Board's holding that "a more dramatic difference in results" is required was held to constitute reversible error. The Board erroneously substituted its judgment for that of an established expert in the art.

This holding with regard to claim 8, however, was somewhat tarnished by that concerning the rejection of claim 9. The Declaration compared the dyestuff of claim 9 with that of its closest counterpart in reference C. The Board regarded the Declaration of little probative value since it did not compare the claimed compound with its closest counterpart in reference B, a reference (combined with reference A) on which claim 9 had been rejected. The Declarant stated that reference C was considered to represent the closest prior art and proceeded to compare properties of the dyestuff of claim 9 with those of its closest counterpart in reference C. Appellants argued that a sulfonamino group is closer in characteristics and properties to the carbonamino

group of reference C than to the thio group disclosed in reference B. This argument, however, notwithstanding its support by the expert Declarant, was discounted by the Court, apparently because the rejection of claim 9 was based in part on reference B.

The Court stated that the prima facie case with regard to claim 9 was unrebutted because appellant did not provide a comparison with the closest prior art. The Court expressly rejected the Declarant's statement that reference C represented the closest prior art because the rejection of claim 9 was made on reference B, and reference A taught that the several bridging groups disclosed in the latter were interchangeable.

There appears to be a body of law which establishes that a comparison against more-closely related prior art should be adequate to overcome PTO reliance upon more remote prior art. Neither such body of law nor an expert Declarant's unequivocal statement that reference C represented the closest prior art dissuaded the Court from a holding which may well be regarded as ivory-towerish.

Even though an Examiner may be able to piece prior-art disclosures together in anagram fashion to reconstruct a claimed structure, why should an applicant be forced to synthesize compounds for the purpose of a showing when he can establish unexpected results with regard to structures recognized by the art as more closely related to those which are claimed than are the reference compounds relied upon? The Court recognized the importance of relying upon expert knowledge in connection with the rejection of one claim, but refused to rely on the knowledge of the same expert in connection with the rejection of the other claim in the same appeal. The fact that an Examiner had made a rejection based on reference B does not mean that reference B is actually closer prior art in this case than is reference C.

II.

The seriousness of applicant designation in applications for United States Letters Patent will apparently not disappear until the importance of naming the actual inventors is relegated to a secondary position. One might say that there are inroads in this direction, as evidenced by the apparently increasing ease with which changes in named applicants can be made.

The generic claim considered in an appeal [*Ex parte Martin,* 215 USPQ 543 (PTO Bd. App. 1981)] had been rejected on the ground that a named inventor was not a joint inventor of the subject matter defined by that claim; the claim was the invention of only one of the two named applicants. The Board confirmed the requirement of every claim of an

application to be a product of the same inventive entity.

Since claim 1 was the invention of one of the two applicants, it was regarded as prior art against other appealed claims which reflected the joint invention of both applicants.

Another opinion [*Ex parte Smernoff,* 215 USPQ 545 (PTO Bd. App. 1982)] regarding inventorship appears in the same issue of the *Weekly Advance Sheets.* The involved application had actually been previously allowed by the Examiner. As a result of a protest, the application was withdrawn from issue. The protester's position was that the applicant was not the sole inventor of the claimed subject matter and that the protester should be joined as a co-inventor.

The Examiner sided with the protester and rejected the claims. This led to the subject appeal.

The Board took the position that appellant, as the first to file a patent application covering the claimed subject matter, enjoys the presumption that he is the sole inventor thereof. The burden of proof was held to fall on the protester, the later-comer (or upon the Examiner), to demonstrate by "clear and convincing evidence" that the claimed invention was derived through the collaboration of both appellant and the protester.

Appellant apparently felt that the protester was entitled to some consideration for introducing appellant to the market potential of a multi-channel tonometer. However the protester was not linked to any particular structural contribution of the claimed product, and appellant was not regarded to be qualified to render a legal opinion on the issue of inventorship.

The Board confirmed that one who suggests an idea of a result to be accomplished, rather than the means of accomplishing it, is not a co-inventor. The Board found insufficient collaborating evidence to support a conclusion that the protester's disclosure and/or suggestions to appellant would have been sufficient to enable an ordinary mechanic to construct the claimed device. The protester's disclosure to appellant of a portion of the prior art, its disadvantages and the marketing potential of a multi-channel tonometer was not regarded as sufficient to make the protester a co-inventor of the claimed product. The position taken by the Board in this case reflects the weight placed on the inventive entity selected for a particular application at the time of filing.

From the number of currently-reported cases involving inventorship issues, it appears that matters of this type are becoming more significant or that counsel are failing to apprise their clients of the importance of making an appropriate determination at the time of executing

applications for United States Letters Patent. In an interference [*Fisher v. Gardner,* 215 USPQ 620 (PTO Bd. Pat. Int. 1981)] both parties decided that their respective named inventive entities were incorrect.

Prior to filing its preliminary statement, G & A determined that A was the sole inventor of the subject matter claimed in its patent and filed a request for a Certificate of Correction under 35 U.S.C. 256 and 37 C.F.R. 1.324 requesting that G be deleted as a joint inventor. The associate solicitor held that the presented showing prima facie conformed with the law, but withheld issuance of the Certificate pending the outcome of the interference for the reason that evidence introduced during the interference might relate to the question of inventorship. As A died before the time set for filing preliminary statements, his preliminary statement was made by an officer of his assignee.

At a later time in the proceedings, F & S determined that S was incorrectly included and that H was incorrectly omitted as a joint inventor from both the interfering application and a parent application (now an issued patent) upon which reliance was being placed. F & S filed a motion under 37 C.F.R. 1.231(a)(5) to amend their involved application to reflect what was then determined to be the correct inventive entity. Concurrently therewith a request for a Certificate of Correction under 37 U.S.C. 256 and 37 C.F.R. 1.324 was filed in the benefit (parent) case, now an issued patent. The associate solicitor found the presented showing to conform prima facie with the law, but, as in the case of the senior party, A, withheld issuance of the Certificate pending termination of the interference.

F & S also filed a motion to amend the preliminary statement together with an amended statement made by F & H; the dates alleged in the amended statement were virtually identical with those alleged in the original statement.

A contended that F & S were not diligent in correcting the error in inventorship in their involved and benefit applications. He asserted that F & S knew or should have known at least by the time they filed their original preliminary statement that there was a question about the correctness of the inventive entity named in their patent and the involved application. Supporting evidence was also provided.

Even though counsel for F & S was in-house counsel who was aware of the evidence relied upon by G & A and made no investigation into the possibility of a misjoinder of inventors, the Board of Patent Interferences decided that that did not warrant the finding of a lack of diligence on the part of F & S in correcting the misjoinder. The Board pointed out that the primary reason that a party is required to act

diligently to correct the misjoinder of inventors in an interference context is so that his opponent will know the correct name of the party's inventive entity and thereby know whom the party can or cannot rely upon as a collaborating witness for conception, reduction to practice, etc. As F & S moved to correct the misjoinder at the time they served their documents and lists pursuant to 37 C.F.R. 1.287(a), A was aware that F & S were relying on the inventive entity of F & H before F & S took any testimony. In addition, the collaboration problem did not arise in this case since S was not relied upon to collaborate conception, and his testimony relating to an actual reduction to practice was regarded to be at most cumulative. Both requested conversions were permitted.

III.

A number of questions are still to be answered regarding qualifications for "Small Entity" status; the forms provided by the PTO and explanations thus far given apparently do not yet provide enough information to make reliable determinations in a number of instances. We should like to share PTO's answers to a number of questions.

1. If an applicant is a sole inventor whose only obligation is to provide the United States Government with a royalty-free license, can he qualify for "Small Entity" status?

   Answer — This question does not have a simple "yes" or "no" answer according to a notice dated January 14, 1983 (1027 O.G. 71), which reads in part:

   ... an independent inventor, small business concern or nonprofit organization, which is otherwise qualified as a small entity for purposes of paying reduced patent fees under 37 CFR 1.9 and 1.27, is not disqualified therefrom because of a license to a Federal agency pursuant to 35 U.S.C. 202(c)(4). A license to a Federal agency resulting from a funding agreement with that agency pursuant to 35 U.S.C. 202(c)(4) does not constitute a license for purposes of 37 CFR 1.9 or a transfer of rights for purposes of 37 CFR 1.27. Any other license or rights to a Federal agency will, of course, preclude qualification as a small entity for purposes of paying reduced fees.

2. If rights to the invention in foreign countries and/or corresponding applications in foreign countries are assigned and/or licensed to parties who do not qualify for "Small Entity" status, does this preclude the application in the United States of America from qualifying for "Small Entity" status when the applicant is a sole inventor who has not assigned and is not obliged to anyone to as-

sign any rights whatsoever in the United States of America?

Answer — No.

3. In determining "Small Entity" status, do rights relating to the invention have to be rights in the U.S.A. concerning the claimed invention and/or rights in the application for U.S.A. Letters Patent?

   Answer — Yes, the locus of the rights must be in the U.S.A.

4. If an applicant has a number of non-exclusive licensees, none of which have more than 200 employees, is he entitled to "Small Entity" status if the aggregate of his licensees employ more than 500 people?

   Answer — Yes, unless affiliated licensees have more than 500 employees.

5. If the aggregate number of employees of non-exclusive licensees in the U.S.A. is less than 500, but applicant has licensees under corresponding foreign applications which bring the aggregate number of employees of all licensees above 500, does this preclude "Small Entity" status?

   Answer — No.

6. Does "obligation" to assign or license include an outstanding offer which has not yet been accepted?

   Answer — No.

7. Does an "obligation" to assign or license include a newspaper advertisement offering to license the invention?

   Answer — No.

8. Does "non-profit organization" encompass State run or authorized non-profit and tax exempt scientific and testing organizations which have more than 500 employees?

   Answer — Yes, if stated test is met.

9. If the non-profit and tax exempt scientific and testing organization referred to in question 8 has a subsidiary corporation which exists by legislative enactment, has a staff of approximately 20 employees and obtains protection for inventions in which the parent non-profit organization has an interest, would the subsidiary corporation qualify for "Small Entity" status if it held any obtained intellectual property rights in its own name?

   Answer — (same as for 8).

10. Would the answer to question 9 be different if the subsidiary were obligated to pay a portion of royalties it receives to inventive entities, some of which may not be able to qualify for "Small Entity" status?

    Answer — Yes.

11. If an applicant has contracted to give a large entity an option to match an offer for a license under his claimed invention, would that destroy "Small Entity" status?

    Answer — Yes.

IV.

The actual skill attributed to the hypothetical man of ordinary skill in the art (MOSITA) seems to vary with the desires of the parties applying a particular test. When an Examiner rejects claims of an application for Letters Patent over prior art, the level of skill can be almost boundless; when the same Examiner rejects claims under the first paragraph 35 U.S.C. 112, the applied level of skill might more nearly approach that of a moron.

An interesting situation appears from the facts presented by the opinion for the Court in *Bailey v. Chattem, Inc.*, 215 USPQ 671 (6th Cir. 1982). It seems that B had been exposed in the 1960's to the idea of premixing aluminum alkoxide with paint thinner and adding the resulting premix to alkyd resin to form a "thixotropic" paint, one that maintained a low viscosity during application but had a high viscosity after application. The obtained paint was thus easy to apply and still resisted dripping and sagging once it was on a vertical surface. A similar problem was encountered when using unsaturated polyester resins to form fiberglass products. In 1970, B conceived of adding aluminum alkoxides to polyester resins to render then thixotropic without undesired side effects of corresponding prior-art compositions. In April 1970, B actually made an invention disclosure record, which he had witnessed by his son and by his wife. He did not, however, reduce his idea to practice at that time.

In 1974 B met C. C produced aluminum alkoxides and was looking for new uses for his products. According to a consulting agreement entered into on October 1, 1974, B agreed that any discovery or invention made by him and involving C's operations (during or as a direct result of such consultation agreement) would be the exclusive property of C.

Soon thereafter B premixed aluminum alkoxide in styrene (solvent for unsaturated polyester resin) and then added the resulting premix

to polyester resin. With some further refinements a viable thixotropic product was obtained. B filed an application for Letters Patent which matured into USP 4,049,748 after B assigned his rights in his invention to C.

To prevail at trial B had to persuade the jury that adding aluminum alkoxide in a styrene premix to polyester resins to give the resin thixotropic properties was "invented" (as the term was used in the original consulting agreement) by him prior to the start of his consulting for C. If the "invention" did not take place until after the start of consultation, then (by the terms of the consulting agreement) it belonged to C. To prove that the invention preceded the date of the agreement, B introduced his invention disclosure record. The record described the addition of aluminum alkoxide to polyester resins to achieve a thixotropic fluid. However, the invention disclosure record did not describe the use of a styrene premix to introduce the aluminum alkoxide into the resins. For most aluminum alkoxide compounds such a premix is apparently necessary to produce a thixotropic fluid and to avoid a mixture with the undesirable consistency of applesauce.

C argued at trial that B's invention was not complete until he actually reduced the idea to practice by adding aluminum alkoxide to the resin in a styrene premix. B did not do this until after he began consulting for C.

In connection with his patent application, B distinguished the addition of aluminum alkoxide to alkyd and polyester resins, but he may not have disclosed the use of a premix with alkyd resins. He also disclosed prior art wherein aluminum alkoxide was added to polyester resins. He distinguished this latter prior art on the ground that it did not show the use of a premix and produced a polyester resin without thixotropic properties. B contended to the PTO that his invention was adding aluminum alkoxide to the polyester resin in a premix instead of directly. B apparently relied on the inventiveness of using a premix to obtain his patent, but it does not seem that he ever disclosed to the PTO that (as he successfully argued to the jury to establish his rights in the invention) he considered a premix step obvious from his work with alkyd resins.

C contended that B could not have it both ways. If the essence of B's invention was the premix and B's use of a premix with polyester resin was not obvious, the jury could not have found that the use of a premix was obvious prior to the time of the consultation agreement; B's invention would thus have to be regarded as incomplete until B first used the premix with unsaturated polyester resin, i.e. after he began work for C. If, on the other hand, the need for a premix step was so obvious

from B's work with alkyd resins that he did not need to write it down, the use of a premix could not impart patentable distinctness to B's invention over prior art B was obliged to disclose to the PTO.

The Court refused to decide this issue on the ground that C had not preserved the question for review, the precise issue had not been presented to the Court below.

This was only one of many issues presented to the Court. Another issue of interest involved commercialization of the patented invention. The jury's verdict below was that C breached an implied contractual duty to utilize its best efforts to commercialize B's invention. In holding that it was not error for the jury to imply a duty of good faith performance on the part of C, the Court relied upon:

a) a leading treatise of contract law which pointed out that there will nearly always be found an implied promise of diligence and careful performance in good faith in any commercial agreement in which the compensation promised by one to the other is a percentage of profits or receipts, or is a royalty on goods sold, manufactured or mined;

b) evidence that the lack of commercial success was due to a "cobalt problem", which C had no success in solving even though it was readily solved by B; and

c) evidence of a potential yearly market of four million dollars for B's invention.

The issues considered also included one of conflict of laws and one of promissory fraud. For further details reference is made to the Court's opinion.

V.

According to a notice which appeared in the *Official Gazette* of 23 November, 1982, a new procedure will be instituted on 27 February, 1983. The Patent and Trademark Office (PTO) is amending the rules for patent cases to permit an applicant to file a continuation or division of a pending patent application by simply filing a request therefor and paying the necessary application filing fee. To file a continuation-in-part (cip) application, an amendment adding the additional subject matter and an oath or declaration relating thereto is also required. It may not be necessary to have an executed declaration or to pay the filing fee at the time of filing an amendment for a cip application in order to secure a filing date; in any event, the required fee and executed declaration will have to be filed in due course.

Under the simplified (FWC) procedure, any continuing application, such as a continuation, cip, or divisional application may be filed by using the papers in the copending prior application, which application will automatically become expressly abandoned. Under the FWC procedure, a new serial number will be assigned and the specification, drawings and other papers in the parent application file wrapper will be used as the papers in the continuing application.

The FWC procedure will be available for any continuation, cip or divisional application provided the applicant wishes the copending prior application to become abandoned. If a divisional application is desired without abandonment of the parent application, the procedure under 37 C.F.R. §1.60 should be used. Applicant also has the option of filing new application papers with a re-executed oath or declaration.

Irwin M. Aisenberg

Washington, D.C.

Overcoming Negotiation Barriers In Technology Transfer

This commentary covers the major barriers to concluding a successful technology transfer negotiation. It is based on the past seven years of taking surveys, evaluating and teaching negotiation to several thousand company presidents, sales managers, licensing executives, technical directors and others.

The business examples that follow will deal with the difficulty of licensing a non-infringer. This is the toughest situation in licensing because the prospect is not presently practicing your technology, may not even know of its existence, and has no interest in paying one cent for something that has to compete with the prospect's in-house venture plans.

There are ten primary barriers in licensing negotiation. They divide equally into five business barriers and five personal or emotional barriers.

First the business barriers.

You pick a candidate you think is most likely to be interested in your technology. The first barrier to closing the deal is that you may have improperly researched that candidate's current business or future plans. In other words, the technology you have may not be compatible with their business plans; the product/market mix they currently have and are forecasting for the future.

The second business barrier is that even if your technology is compatible with the prospect's business plans, the way you set up your license offer may not be compatible with their internal policies. For instance, they may always require an exclusive license. They may never agree to giving a grant-back for improvements. They may never agree to giving more than a 3% royalty. All these things may conflict with the way you tailor your offer or what you require as your bottom line.

Assuming you get past the business plan and internal policy barriers of the candidate, the third barrier confronting you is persuading them that there is an existing or latent need on the part of the marketplace for this technology. Market acceptance. Will people buy whatever you're offering to license or are you ahead of your time?

Sometimes this third barrier can be handled by timing the negotiation so that they are in a weak position and you are bargaining from strength. If you have a cost saving innovation, you may have to wait until the Japanese start underpricing the industry and create a need for your technology. This is the same timing tactic practiced by the unions. For instance, sanitation workers wait until the summer to strike. Garbage stinks and their service is needed the most then.

Assuming there is market acceptance, you have the fourth barrier of persuading the licensing candidate that the technology is technically feasible; that they will be able to build what your patent or know-how says can be built; and that it will work and work satisfactorily for its intended purpose.

The fifth barrier is persuading the prospect that the cost analysis is correct and that whatever the end result of your licensed technology comes out to be, whatever that product is, it will not be too costly for the market to bear.

In essence, all five personal barriers relate to suspicion, skepticism, mistrust and uncooperative behavior on the part of the licensing candidate.

The first personal barrier you have to overcome, and research indicates this is the most difficult, is satisfying the other party's emotional needs. The needs of survival (survival in business), security, esteem, and friendship. How you fill these needs is dependent on the type of person you are dealing with. Whether that person is in the dominant or parent mode, whether in the detached or adult mode, or whether in the dependent or child mode. Whether that person communicates as a thinker, intuitor, feeler or sensor. Whether that person is OK or Not OK regarding self concept and how others are viewed. These are things that salespersons learn in sales training courses and this is what licensing negotiation is all about to a large extent. You have to sell your credibility; the fact that you really care about the other side and you are concerned about their problems as well as yours. How (within the first few minutes that you meet a total stranger) you can tell what kind of personality he has, what mode he is in, and when he switches modes is important to master. All of this is based on the scientific research. Once you know what the conclusions of the investigators are, you know how to act with any of these types of people.

About 75% of us give others the impression of being strong negotiators with varying degrees of competitive and aggressive behavior. Such behavior creates suspicion and hypercriticism in the other party's mind. This is explained by research the U.S. Navy conducted and called the reflection theory. If somebody comes up to you and starts shouting at you, it's almost a natural human reaction to shout back. If somebody comes up to you and warmly shakes your hand, has a warm smile, greets you in a friendly manner and really shows that he thinks highly of you and is going to be fair with you, you'll reflect back that same cooperative friendly behavior.

The research shows that the concession giving person in negotiations actually tears away the competitiveness, hostility and defense

mechanisms that parties they deal with initially have.

Now, if you're dealing with a Soviet or Eastern bloc negotiator who has to account to his boss and his particular trade organization, you'll find that he tends to be dominant and highly competitive. It isn't as acute to show friendliness. As a matter of fact, it may be a mistake to convey the impression you are a concession giver or he may walk all over you.

On the other hand when dealing with the Japanese culture, it is very important that they have a long trusting warm relationship with you. It is critical that you convey the impression you're friendly, you are cooperative, and you are a concession giver, even though you may be the toughest hard-nosed negotiator.

The second personal barrier is so simple, so obvious that most of us never even think about it. The prospective license will not close the deal with you until he feels that he has extracted the last possible concession from you. Assume he said he doesn't want to pay more than a 2% royalty, for instance, and you started up at 5%. He keeps on giving you reasons why you should come down, and you get down to 4%, you are down to 3½% already, and you've never made it clear where you are drawing the line. Many times this is a difficult thing to do. The research show the majority of businessmen just dread having to tell the other party that's it. "I'm not giving you any further concession, I'm not coming down any more, take it or leave it." Not in those terms, but in more subtle language. It is hard to do because you're afraid it may kill the deal. But you're not going to close the deal until you make the other party know for sure that you're not making any further concessions; you're not going to compromise any further.

Too many top level executives in our Fortune 500 companies practically ask what they must have immediately or slightly more. They do not give themselves enough leeway to make concessions, to compromise. It is human nature that most negotiators are not happy — not satisfied until they have several concessions from the other side. If they haven't, they feel they are not getting a good deal.

The third personal barrier is reluctance or fear on the part of the prospect to make the last commitment or take that last action to sign on the dotted line or shake your hand that you have an agreement in principle which will be honored until the contract is drafted and signed. Why is there this reluctance or fear? It could be any one of a number of things and it all goes back to satisfying emotional needs. If the negotiator for the licensing candidate has been offended in some way, if you haven't built up his esteem needs, if you've insulted him in some manner, or if you've said things that hurt your credibility and led

him to mistrust you, then he has to worry about his own survival and security needs. He has to go back to his boss and his company and put his own job on the firing line. If he has to recommend paying half a million dollars front money to get the secret know-how in addition to the patent rights and if he has misjudged you, if he fears that you may be conning him or just exaggerating regarding your firms technical capabilities, you have problems.

The above comments on deviousness and deceit may seem unnecessary to many of you because of the high ethical values that are characteristic of the licensing profession. However, Time magazine reported the study of one psychologist which concluded the average American literally lies 200 times a day. Another study by Cambridge Survey Research concluded that 69% of the public believes that the country's leaders consistently lie and that lying is an accepted part of the medical and legal professions.

A fourth barrier is misunderstanding on the part of the other person; poor communication. There are definite techniques of communication in negotiation that too many of us completely overlook. Too many times the other party out of embarrassment or courtesy to you, even if he doesn't understand what you were mumbling or the sophisticated terminology you were using, will not interrupt to ask that you stop and explain or repeat yourself. Once that happens, the party is inclined to say no when you finally get through with your presentation. He is saying no because he isn't completely sure what commitments you're asking of him.

The fifth personal barrier is when the other party has an embarrassing or hidden reason for not wanting to close the deal and you have no hint what it is. Maybe he doesn't have authority, maybe he heard rumors about you through other people you've negotiated with, or maybe his boss is simply against it.

One approach to breaking this deadlock is the tactic of abdication. You tell the other side that you are at a loss as to what to do now. You feel that your proposed position is reasonable, but that if the other side can come up with an even more equitable solution to the problem, you will go along with it. In other words, you dump the whole ball of wax onto the other negotiator's lap to resolve with the hint that you will accept an equitable proposal. When a negotiator is faced with the task of coming up with something that is fair to both sides, he will quite often seek a creative solution that will indeed be fair, and he will sometimes bend over backwards to be fair to the other party. At the same time you have the opportunity to smoke out the hidden reasons for not previously closing the deal.

Sometimes a stalemate is caused because the other negotiator would be personally embarrassed to make the necessary admission or concession that would lead to agreement. In this situation, a face-saving excuse should be invented in order to fulfill the other negotiator's esteem needs. If necessary, a third party consultant or mediator should be brought in to make the decision for the other side. Another approach would be to bow out of the negotiation and bring in a fresh face from your company in order to remove the intangible issue that may be hindering the close.

If aware of the above negotiation considerations, you can use this knowledge to your advantage to dramatically improve your effectiveness. You can identify and satisfy emotional and busness needs by predetermined tactics, strategically implemented and modified as the negotiation proceeds, so that you can negotiate the best deal every time in any changing bargaining situation.

*President, REFAC International, Ltd. and author of *Negotiation in Day-to-Day Business, Intellectual Property Management, The Science of Business Negotiation* and *Fail-Safe Business Negotiating: Strategies and Tactics for Success* and recipient of 1983 Writers Conference Award.

PATENTS ON ALGORITHMS, DISCOVERIES, AND SCIENTIFIC PRINCIPLES

BY RONALD F. CHAPURAN*

"The acts of today become the precedent of tomorrow," Farrer Herschell, May 1878

The acts of today should also be based on precedent. In *Diamond v. Diehr,*[1] Justice Rehnquist speaking for the majority, it was decided that a process for curing synthetic rubber is patentable subject matter even though the process included the use of a mathematical formula in a programmed digital computer. It was decided that novelty is not an appropriate consideration for patentable subject matter under 35 U.S.C. §101.

Justice Stevens, in dissent, asserted that if the programmed formula was treated as though it were a familiar part of the prior art, the application contained no claim of patentable invention and was properly rejected under §101.

In *Parker v. Flook,*[2] Justice Stevens speaking for the majority, it was held that a claim to a method of updating alarm limits in a catalytic chemical conversion process was only an improved method of calculation even though tied to a specific end use and therefore unpatentable subject matter under §101.

Justice Stewart, in dissent, asserted that a claimed process does not lose its status of subject matter patentability because one step of the process (programmed calculation) would not be patentable subject matter if considered in isolation.

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*Member, Virginia and Indiana Bars. Counsel, Rochester Patent Operations, Xerox Corporation. The opinions submitted are solely those of the author.

[1] 450 U.S. 175, 209 U.S.P.Q. 1 (1981).

[2] 437 U.S. 584, 198 U.S.P.Q. 193 (1978).

In both cases, processes having a programmed computer as a key element were claimed. Other similarities in the processes included an initial calculation, continued remeasurement and recalculation, and use of the value obtained from the calculation in controlling the process. In truth, the facts of *Diehr* and *Flook* are difficult to distinguish.[3] Both sides cited many of the same basic court decisions as precedent. Perhaps Aldous Huxley was right,

> Facts are ventriloquists' dummies. Sitting on a wise man's knee they may be made to utter words of wisdom; elsewhere, they say nothing, or talk nonsense . . . .

Parker v. Flook

In *Flook,* the invention was a method for updating the alarm limits of process variables in the catalytic chemical conversion of hydrocarbons. During the catalytic conversion process, operating conditions such as temperature, pressure and flow rates are constantly monitored. If any of these conditions exceeds a predetermined limit, an alarm will signal the presence of an abnormal condition. It is often necessary to update the alarm limits periodically.

In particular, in *Flook,* there was claimed a method for updating the value of the alarm limit on one process variable in the chemical conversion process. The essence of the invention was the discovery of a mathematical relationship for recalculating and updating the value of the alarm limit. The *only* acknowledged *novel* feature of the method was the *mathematical formula.* The formula was applied to the process using a programmed computer to calculate and update the alarm limit.

The *question* according to the majority, was whether useful, although conventional, post-solution applications of a novel mathematical formula made the invention "Method For Updating Alarm Limits" eligible for patent protection.[4] *Not* included in the question was the fact that the method for updating alarm limits was part of a claimed process for the catalytic chemical conversion of hydrocarbons. If the chemical conversion process had been considered, the question should have been whether the discovery of a novel mathematical relationship applied to a conventional industrial method put the method into the category of unpatentable subject matter.

It would seem, following *Mackay Radio,*[5] that if the conventional method or apparatus was patentable subject matter, an improvement

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[3] 67 L.Ed. 2d at 179, n.31, 209 U.S.P.Q. at 18, n.31.

[4] 437 U.S. at 584, 198 U.S.P.Q. at 193.

[5] Mackay Radio and Telegraph Co. v. Radio Corporation of America, 306 U.S. 86, 40 U.S.P.Q. 199 (1939).

to the method or apparatus (even if only applying a mathematical formula) is still patentable subject matter. In fact, in *Mackay Radio,* a *well-known* mathematical formula was applied to produce an improvement in well-known V-type radio antennas. The *novelty,* if any, was in the *use* of the well-known formula to design an improved antenna. Yet patentable subject matter was not an issue. The fabrication of the improved antenna was straightforward once the relationships expressed in the formula were understood.[6]

The underlying shortcoming of the *Flook* decision is that the Court in applying §101, focuses on the "type of discovery" sought to be patented.[7] If "type of discovery" meant the claimed subject matter, then it would be the proper focus in determining patentable subject matter under §101.

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[6] In *Mackay Radio,* the well-known Abraham mathematical formula was used to determine the desired relationship of components in a directional V-type radio antenna. V-type antennas were also well-known and consisted of at least two copper wires arranged at an angle in the form of a V. The formula expressed the scientific truth that when radio activity is projected from a charged wire of finite length, the angle between the direction of the principal radio activity and the wire is dependent on wavelength and wire length, the wire length being a multiple of half wavelengths.

In accordance with the invention, the Abraham formula was used to calculate values of angles for wires of specified lengths. The results of the calculations were plotted and an *empirical formula derived.* The empirical formula was used to determine the best angle for directional radio propagation in V-type antennas.

The geometry of the antenna construction was determined by this angular relationship and the empirical formula was the essence of the claimed subject matter. For example, Claim 15 recited:

> 15. An antenna comprising a pair of relatively long conductors disposed with respect to each other at an angle substantially equal to twice
>
> $$50.9\left(\frac{\ell}{\lambda}\right)-0.513$$
>
> degrees, ℓ being the length of the wire and λ the operating wave length in like units, and means in circuit with said antenna for exciting the conductors in phase opposition whereby standing waves of opposite instantaneous polarity are formed on the conductors through their length.

In effect, the claim defined the antenna structure in terms of the empirical formula derived from Abraham's formula. The issue in the case was the validity and infringement of two claims. The Court found non-infringement and did not decide the validity issue. Although patentable subject matter was not an issue, the Court stated "While a scientific truth, or the mathematical expression of it, is not patentable invention, a novel and useful structure created with the aid of knowledge of scientific truth may be."

[7] 437 U.S. at 593, 198 U.S.P.Q. at 198-99.

But Justice Stevens did not mean the claimed subject matter. By type of discovery, he meant precisely what the inventor discovered or considered to be his "inventive concept," a term he later used in the *Diehr* case.[8] The proper focus for §101 should be on the discovery as embodied in the claims (the claimed subject matter), not on the discovery in isolation.

Obviously, mere discoveries in the abstract are not patentable subject matter. In *Earle v. Sawyer,* Justice Story stated the law, "The thing to be patented is not a mere elementary principle or intellectual discovery but a principle put in practice, and applied to some art, machine, manufacture or composition of matter."[9]

This is a pure statement of *patentable subject matter* distinct from the definition of *patentable invention* that includes novelty and patentable subject matter. For a patentable invention, there must be a new and unobvious application of the discovery. For patentable subject matter there need only be a useful application of the discovery. On patentable subject matter, in Curtis, *The Law of Patents,* §146, 4th Ed., 1873, it is stated that

> if the patentee was the first person to discover and *apply* the principle . . . and if he described a means of doing it, then his patent did not claim an abstract principle, unless by his claim he had severed the principle from all mechanical means. By an abstract principle, in the sense of the patent law, I understand a . . . physical truth, disconnected from practical application.

More recently, the law was stated in *Mackay Radio,* "While a scientific truth, or the mathematical expression of it, is not a patentable invention, a novel and useful structure created with the aid of knowledge of scientific truth may be."[10] This is a definition of a patentable invention. Stripping novelty from this statement, patentable subject matter is a useful structure created by the application of a scientific truth.

In short, for the discovery or principle to become patentable subject matter, there must be an application of the discovery or principle to a useful end. We look to the claims to show this application. If the claims merely recite the discovery divorced from the application, the claimed invention is not patentable subject matter. However, if the claims ex-

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[8] 67 L. Ed. 2d at 181, 209 U.S.P.Q. at 19.

[9] 8 Fed. Cas. 254, 256 (Circuit Court, D. Mass. 1825).

[10] 306 U.S. at 94, 40 U.S.P.Q. at 202.

press the application, the claimed invention is patentable subject matter.[11]

In effect, the Court in *Flook* in focusing on the type of discovery, was dissecting the claims into old and new elements in applying §101. This is applying novelty considerations to the issue of patentable subject matter rather than to the issue of patentable invention. The Court in *Diehr* demonstrated from the legislative history of the 1952 Patent Act that novelty considerations under 35 U.S.C. §102 are distinct from patentable subject matter considerations under 35 U.S.C. §101.[12] As stated by Judge Rich in *In re Bergy,* 596 F.2d 952, 960-61 (CCPA 1979), the question of novelty is "wholly apart from whether the invention falls into a category of statutory subject matter."

Once the Court in *Flook* centered on the discovery or novel formula rather than on the claimed subject matter, it applied its own notions of novelty to the discovery. In fact, it decided that the discovery could not be considered novel after all. The *Flook* Court would then conclude that the "application" considered as a whole contained no patentable invention. If no patentable invention, the Court reasoned, there must be no patentable subject matter, 437 U.S. at 594, 198 U.S.P.Q. at 199. The Court was reversing the usual order of finding patentable subject matter first and then determining if the patentable subject matter was a patentable invention under 35 U.S.C. §102 and 35 U.S.C. §103.

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[11] In *Flook,* 437 U.S. at 591, 198 U.S.P.Q. at 197, there is concern that patentable subject matter easily depends on the draftsman's art. It should be noted, however, that a great many inventions, particularly in processes, are really abstract concepts. As stated in Tilghman v. Proctor, 102 U.S. 707, 728 (1880), "A machine is a thing. A process is an act or mode of acting. The one is visible to the eye — an object of perpetual observation, the other is conception of the mind, seen only by its effects when being executed or performed."

The *role* of the patent attorney is to recite in the claims the effects or the application of these concepts in order to cover patentable subject matter. The attorney must also recite in the claims the novel and unobvious aspects of the invention to cover a patentable invention. If the invention is claimed too narrowly, the patent is easily avoided, and the inventor loses his rightful protection. If the invention is claimed too broadly, the claim will be easily rejected by the Examiner in view of the prior art, or even rejected as merely a claim to an idea devoid of application. The skill of the patent draftsman is to draw the line between too narrow and too broad.

This is not exalting form over substance. Claim drafting is a demanding, precise art. It is at the top of legal drafting challenges. In a commercial environment, most often a competitive edge is at stake. The concern of the draftsman is the rightful protection of a product or process in that environment. Competent draftsmen generally are not merely in search of post-solution activities to attach to mathematical formulas.

[12] 67 L. Ed. 2d at 167-68, 209 U.S.P.Q. at 9, 10.

Two assumptions were needed by the *Flook* Court to reach its conclusion of non-statutory subject matter.

(1) The novel mathematical formula added nothing of a patentable nature to the claimed process. That is, the case had to be considered as if the mathematical formula was well-known.[13]

(2) A new discovery cannot support a patent unless there is inventive concept in its application.[14]

First Assumption

Must a principle or mathematical formula, even though newly discovered, be considered as well-known? Authority for this proposition is taken by the Court in *Flook* from *O'Reilly v. Morse,*[15] the Court in *Morse* quoting the following statement from Baron Parke in *Neilson v. Harford,* Webster's Patent Cases, 273 (1844).

> It is very difficult to distinguish it from the specification of a patent for a principle and this at first created in the minds of some of the court much difficulty; but after full consideration we think that the plaintiff does not merely claim a principle, but a machine embodying a principle, and a very valuable one. We think the case must be considered as if the principle being well known, the plaintiff had first invented a mode of applying it by a mechanical apparatus to furnaces; and his invention consists in this, . . . interposing a receptacle for heated air between the blowing apparatus and the furnace.[16]

Nothing in Baron Parke's passage implies that new principles or discoveries must always be considered as well-known. In fact, the Court in *Tilghman v. Proctor* interpreted this passage as simply drawing the true distinction between a mere principle as the subject matter of a patent and a process by which a principle is applied to effect a

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[13] 437 U.S. at 591-92, 198 U.S.P.Q. at 198.

[14] 437 U.S. at 594, 198 U.S.P.Q. at 199.

[15] 15 How. 62, 115 (1853).

[16] Neilson's invention in England around 1820 was an improvement in the manufacture of iron. Up until then it was common to blow cold air into the blast furnaces during the manufacture of the iron. Cold air was being used because it had been observed that the furnace fires burned better in winter than summer. This, of course, was an erroneous assumption, since the furnace fires burned better in the winter only because the air was dryer not because the air was cooler.

Neilson discovered that, in truth, a hot blast of air in the furnace was much more effective than a cold blast. The means Neilson used to create the hot air blast was an air receptacle sufficiently strong to endure a blast of air into it. The receptacle was externally heated and the air in the receptacle was forced through a tube to the blast furnace. This discovery was patented and a series of four court cases upheld the patent, although there was some confusion whether the invention was for a method or for an apparatus to create the hot blast of air.

useful result.[17] The Court in *Morse* interpreted the passage in a similar manner, that a patent on a mere discovery was void, but a discovery that was *applied* (in the case of Neilson, to furnaces) was patentable subject matter.[18] No significance was given to the statement, that the case must be considered as if the principle was well-known, except as part of a statement of the rule that abstract discoveries are not patentable without application.

This passage of Baron Parke should also be put in context. The term "invention" in those days, was not used in any "non-obvious" or "patentability" sense, but as a general definition. "Invention" was used in the dictionary sense to mean the contrivance or production of something that did not already exist or the fabrication of something useful. Thus, when Baron Parke speaks of inventing a mode of applying the principle, he merely means fabricating a means to apply the principle.

In addition, in England during the time this case was decided, there was still considerable doubt whether or not a process was patentable subject matter. Paragraph V of the Statute of Monopolies, in declaring exceptions to monopolies, listed only patents for working or making any manner of "new manufacture."[19]

In the first case on the issue of processes, *Boulton & Watt v. Bull,* 2H. Blackst 463 (1795), Justice Eyer in the minority held Watt's invention of "lessening the consumption of steam and fuel in fire engines" to be a patent for a method. The majority and also the King's Bench on appeal, however, held the patent to be for a "manufacture consisting of an engine." This interpretation was consistent with the Act of Parliament describing Watt's patent as a patent for making and vending certain "engines."[20]

Judges such as Baron Parke were concerned with extending the definition of "new manufacture" in English patent law to discoveries such as Neilson's. In fact, Baron Parke characterized Neilson's invention not as a method but as a machine embodying a principle, as interposing a receptacle for heated air between the blowing apparatus and the furnace. The concern was not whether a principle was well-known, but how it was applied.

Confusion was created by the Neilson case about whether the patentable invention was for a process or for an apparatus. For example, the Court in *Morse,* on one hand, characterized the invention as the interposing of a heated receptacle between the blower and the furnace.

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[17] 102 U.S. 707, 724 (1880).

[18] Note 15, supra, at 116.

[19] *Walker on Patents,* Deller's Edition, Vol. 1, §5 (1937).

[20] Curtis, *Law of Patents,* 4th Ed., §130 (1873).

On the other hand, the *Morse* Court also termed the invention a process. It stated that whoever used the Neilson method of throwing hot air into the furnace used the process Neilson had invented.[21]

Finally, whether the principle was new or well-known was not an issue before Baron Parke. This distinction was considered, however, by Lord Justice Hope in *Household v. Neilson,* Webster's Patent Cases, 673, (the litigation of Neilson's patent in Scotland). Justice Hope stated the general rule that a well known principle was patentable if applied for the first time to produce a practical result for a special purpose. He went on to say,

> It would be very strange and unjust to refuse the same legal effect when the inventor has the additional merit of discovering the principle as well as its application to a practical object.[22]

Justice Hope found additional merit in the discovery of the principle and its application over the mere application of a known discovery. This was the distinction he drew between known and unknown discoveries.

In *LeRoy v. Tatham,*[23] the invention was the manufacture of lead pipe by forcing soft lead under heat and pressure through apertures, between dies and around a core. In essence, the process produced wrought pipe rather than pipe cast in a mold. The new process was made possible by the *discovery* of the property of lead to be able to reunite perfectly around a core after separation. Pipes formed in this manner had great solidity, unusual strength and a fine uniformity not found in existing pipes.

The majority characterized the invention as a combination of apparatus and found the combination unpatentable in view of the prior art. The majority avoided the issue of the patentability of the practical application of the *newly discovered* property of iron.

Justice Nelson, speaking for the minority, faced the issue of the patentability of the newly discovered property. After thoroughly reviewing prior English case law, he concluded that the settled doctrine was — that having discovered the application for the first time of a *well-known* principle to achieve a new result, a person was entitled to a patent.

Justice Nelson then considered the application of a *novel* principle stating,

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[21] 15 How. 62, 116.

[22] Curtis, *Law of Patents,* 4th Ed., §138, n.2.

[23] 14 How. 156 (1852).

> And a fortiori, if he has discovered the law of nature or property of matter, and applied it he was entitled to the patent . . . .

He went on to state,

> The novel idea in the one case [well-known principle], is the new application of the principle or property of matter . . . in the other, [novel principle] in the discovery of the principle or property and application.[24]

A distinction is made between a *novel application* of a *well-known principle* and *mere application* of a *novel discovery*. The distinction is that if the principle is known, there must be a novel application. On the other hand, if the principle is newly discovered, there need only be an application, not a novel application.

As a practical matter, the distinction between known and unknown principles became important in succeeding case law on the issue of adequacy of disclosure. In particular, whether or not the principle was new or old often influenced the degree of description or disclosure required in the patent specification. That is, if the discovery or principle was well-known, the application of the principle usually was unique. It was necessary, therefore, for the specification to describe the application in detail. On the other hand, if there was novelty in the discovery and the application of the discovery was routine, sufficient disclosure was necessary only to generally teach the application. As Justice Bradley stated in *Tilghman,*

> A mixing of certain substances together or the heating of a substance to a certain temperature is a process. If the mode of doing it or the apparatus in or by which it may be done is sufficiently obvious to suggest itself to a person skilled in the particular art, it is enough in the patent to point out the process to be performed without giving supererogatory directions as to the apparatus or method to be employed. If the mode of applying the process is not obvious, then a description of a particular mode by which it may be applied is sufficient.[25]

There is no basis for the assumption that a new discovery or mathematical formula is to be considered as well-known. In addition, even if the mathematical formula were well-known, a rejection of the claimed subject matter as non-statutory, for only that reason, is not appropriate. Nor is a rejection of the claimed subject matter under §101 appropriate just because the mathematical formula is itself non-statutory subject matter.

For, as Justice Stewart said in dissent in *Flook,*

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[24] *Id.* at 187.

[25] 102 U.S. at 728.

> Indeed I suppose that thousands of processes and combinations have been patented that contained one or more steps or elements that themselves would have been unpatentable subject matter. *Eibel Process Co.* . . . is a case in point. There the Court upheld the validity of an improvement patent that made use of the law of gravity which by itself was clearly unpatentable.[26]

Second Assumption

The Court in *Flook* stated that although an "inventive application" of a well-known mathematical formula may be patented, the discovery of a mathematical relationship cannot support a patent unless there is "inventive concept" in its application.

The Court placed undue emphasis on *Funk Bros. Seed Co. v. Kalo Co.*[27] No one ever doubted an abstract discovery alone was not patentable. It was necessary for the discovery to be embodied in a machine or applied in a process. In *Funk Bros.*, however, the Court required more than a novel discovery and application. The manner of applying the novel discovery must also be unique. In effect, the Court in *Funk Bros.* was asking for an invention on top of an invention before conferring a patent.

In discussing the discovery that certain bacteria species could be mixed without harmful effect, the Court said,

> The aggregation of select strains of the several species into one product is an application of that *newly-discovered* principle. But however *ingenious* the discovery of that natural principle may have been, the *application* of it is hardly more than an advance in the packaging of the inoculants . . . . .
>
> The application of this newly discovered natural principle to the problem of packaging of inoculants may well have been an important commercial advance. There is no way in which we could call it such [an invention] unless we *borrowed invention* from the *discovery* of the natural principle itself.[28] Emphasis added.

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[26] 437 U.S. at 599-600, 198 U.S.P.Q. at 201.

[27] 333 U.S. 127, 76 U.S.P.Q. 280 (1948).

[28] 333 U.S. at 131-32, 76 U.S.P.Q. at 281-82. The technology in *Funk Bros.* was straightforward. There are a family of plants known as leguminous plants including clover, alfalfa and soy beans. These plants have an unusual property. They are able to take nitrogen from the air and fix it into the plant for conversion to organic nitrogenous compounds. The ability of these plants to fix nitrogen from the air to organic compounds depends on the presence of bacteria called rhizobium. The rhizobium bacteria infect the roots of the plants and form nodules on them. These rhizobium bacteria fall into six species.

No one species of the bacteria will infect the roots of all leguminous plants. But each species of bacteria is made up of distinct strains and will infect defined groups of the leguminous plants. Methods of selecting strong strains and of producing a bacterial culture from them had long been known. The bacteria produced by the laboratory methods of culture were placed in a powder or liquid base and packaged for sale to agriculturalists as an inoculant for the seeds of leguminous plants.

Justice Burton and Jackson dissented. Justice Frankfurter also disagreed with the majority but found the patent invalid for lack of adequate disclosure. This case became the basis for some of the reasoning in *Flook,* although the issue in *Funk Bros.* was the novelty of the invention and not the issue of patentable subject matter.

In spite of *Funk Bros.,* there is noteworthy precedent that discoveries or mathematical formulas can support a patent without "inventive application." Fox example, as quoted in *Tilghman, supra,* if the manner of practicing a process is obvious, it is not necessary to give supererogatory directions on the apparatus or method to be employed.[29]

In *Eibel Process Co. v. Minnesota and Ontario Paper Co.,*[30] it was *discovered* that distortions in the paper in paper making machines

It was the general practice to manufacture and sell inoculants containing only one species of the bacteria. The inoculant could therefore be used successfully only in plants of a particular inoculation group. Thus, if a farmer had crops of clover, alfalfa and soy beans, he would have to use three separate inoculants. There had been a few mixed cultures, but they had *proved* generally *unsatisfactory.* Unfortunately, the different species of the bacteria produced an inhibitory affect on each other when mixed in a common base. It was thus assumed that different species were mutually inhibitive.

However, *contrary* to the *teaching* of the time, an individual named Bond discovered that there were strains of each species of root nodule bacteria that did not exert a mutually inhibitive affect on each other. He also discovered that those mutually non-inhibitive strains could be isolated and used in mixed cultures using certain methods of selection and testing. Thus, he provided a mixed culture of rhizobium capable of inoculating the seeds of plants belonging to several groups. His inoculation products were a prompt and substantial commercial success, filling a long sought and important agricultural need.

[29] Note 25, *supra.,* The Tilghman invention in 1853 affected several industries. At that time, stearic and margaric acids were used in the manufacture of candles, oleic acid was used for manufacturing soap, and glycerine was used as a solvent. These chemicals were usually found together in fat, tallow and oil as chemical compounds consisting of a base (glycerine) and the acids (stearic, margaric, and oleic) known as fat acids. For the chemicals to be useful, however, it was necessary to separate the acids from the glycerine.

The methods of separation up until 1853 included the use of sulpheric acid. The methods were inefficient or caused damage to the glycerine. Tilghman discovered that the fat acids could be separated from glycerine without injury to the glycerine by a single and simple process of subjecting the compounds to a high degree of heat in a mixture of water under sufficient pressure. The use of sulpheric acid was not necessary.

The Court affirmed that patent law covered his process, "the manufacturing of fat acids and glycerine from fatty bodies by the action of water at a high temperature and pressure," and concluded that since he had invented a process, the actual apparatus used was not material.

[30] 261 U.S. 45 (1923). Paper making machinery in 1910 was simply an endless wire cloth sieve driven over a series of rolls at a constant speed. At one end of the

were caused by the fiber stock moving at a different speed than the wire cloth sieve onto which the fiber stock was deposited. There was no "inventive concept" in the application of this discovery since the application was merely to apply the law of gravity by raising the pitch of the sieve from 3 to 12 inches. As Chief Justice Taft stated,

> The invention was not the mere use of a high or substantial pitch to remedy a known source of trouble. It was the discovery of the source not before known and the application of the remedy for which Eibel was entitled to be rewarded in his patent.[31]

Before Alexander Graham Bell's invention, it had long been believed that if the vibration of air caused by the voice in speaking could be reproduced at a distance by means of electricity, the speech itself could be reproduced and understood. How to do it was the question.

Bell *discovered* that it could be done by gradually changing the intensity of an electric current to correspond exactly to the changes in the density of the air caused by the sound of the voice. According to the Court in the *Telephone Cases,*[32] this discovery was his "art." Bell then devised the means in which his discovery or art could be accomplished and speech actually transmitted. "Inventive concept" in the accomplishment of Bell's discovery was not relevant. Chief Justice Waite stated:

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machine, a stream of fibers of wood pulp mixed with water were discharged upon the cloth sieve. As the stream of fiber stock moved along with the cloth sieve, the water drained through the meshes of the sieve. The fibers then became deposited on the cloth sieve. The constant shaking and stimulating of the sieve insured the proper interlocking and belting of the fiber as it progressed along with the sieve. There was a gradual slope of three inches of the cloth sieve from the point where the fiber was deposited on the sieve to the point where the fiber stock left the sieve. The fibers then were driven off the cloth sieve to be pressed and dried as finished paper. It was well-known at that time that increasing the speed of the cloth sieve beyond 500 feet a minute resulted in defective paper.

William Eibel was a superintendent at a paper mill in Rhinelander, Wisconsin. He determined that the defective paper was due to disturbance in the fiber stock as it traveled along with the cloth sieve. He observed that the disturbance was caused by the fact that at certain points, the cloth sieve was traveling much faster than the stock. He concluded that if the speed of the flowing fiber stock could be increased approximately to the speed of the cloth sieve, the disturbance would cease and the defects would disappear from the paper product.

Eibel's idea was *merely* to *raise* the slope of the cloth sieve from *three inches* to *twelve inches.* This allowed the force of gravity to increase the speed of the fiber stock to maintain a relatively constant speed with the movement of the cloth sieve. His invention was an immediate commercial success.

[31] *Id.* at 68.

[32] 126 U.S. 1.

> The patent for the art does not necessarily involve a patent for the particular means employed for using it. Indeed, the mention of any means, in the specification or descriptive portion of the patent, is only necessary to show that the art can be used; for it is only useful arts — arts which may be used to advantage — that can be made the subject of a patent.[33]

In the *Neilson* case, the discovery was that a hot blast of air worked better in a blast furnace than a cold blast of air. Neilson's specification only generally directed that the air be heated by passing it through an artificially heated receptacle before the air was introduced into the furnace. No particular directions as to temperature were given and it was left to workmen to adapt the size of the air vessel to the temperature desired. The construction of a heating receptacle was merely incidental to the discovery.

In *Household Co. v. Neilson,* Webster's Patent Cases 673, the law was stated,

> The main merit, the most important part of the invention, may consist in the conception of the original idea — in the discovery of the principle in science, or of the law of nature, stated in the patent, and little or no pains may have been taken in working out the best manner and mode of the application of the principle to the purpose set forth in the patent. But still, if the principle is stated to be applicable to any special purpose, so as to produce any result previously unknown, in the way and for the objects described, the patent is good.[34]

The majority in *LeRoy v. Tatham* quoted *Household* with approval. In particular, the Court stated that the subject matter of a patent could be the discovery of a general and comprehensive principle "if that principle is by the specification applied to any special purpose, so as thereby to effectuate a result and benefit not previously attained."[35] Justice Nelson speaking for the minority in *LeRoy v. Tatham* elaborated on *Household* by stating that the mode or means of practicing the invention may be only incidental and flowing naturally from the original conception. He went on to say:

> To hold, in the case of inventions of this character, that the novelty must consist of the mode or means of the new application producing the new result, would be . . . mistaking the skill of the mechanic for the genius of the inventor.[36]

In *Mackay Radio,* the Court did not decide the validity issue. However, concerning the application of Abraham's formula to improve a known antenna, Justice Stone stated,

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[33] *Id.* at 532-33.

[34] Curtis, *Law of Patents,* 4th Ed., §138, n.2.

[35] 14 How. 156, 175.

[36] *Id.* at 187.

> We assume, without deciding the point, that this advance was [patentable] invention even though it was achieved by the logical application of a known scientific law to a familiar type of antenna.[37]

As Curtis stated, "the patentee must have invented and described some mode of carrying the principle into effect. He may or may not have invented new devices, contrivances or means in order to give effect to the application of the principle. He has invented what he is required to invent when he has by any means, new or old, but by the use of means, for the first time given practical application to the principle; and he has described what he is required to describe, when he has shown a practical means of effecting the application."[38]

That the *main merit* of the invention may consist in the discovery or conception of the original idea is not accepted by the majority in *Flook*. In addition to reading too much into Baron Parke's statement in *Neilson* and over-emphasizing *Funk Bros.*, the Court in *Flook* stretched *Gottschalk v. Benson*[39] out of proportion.

Gottschalk v. Benson

In *Benson,* the invention was a computer program to convert binary coded decimal numerals to pure binary numerals — not an invention that really captured anyone's imagination. Justice Douglas, in invalidating the patent, stated that the method or mathematical formula for converting had no substantial practical application except in connection with a digital computer.[40] He said, "The claims were not limited to any particular art or technology, to any particular apparatus or machinery or to any particular end use."[41]

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[37] 306 U.S. at 94, 40 U.S.P.Q. at 202.

[38] Curtis, *Law of Patents,* 4th Ed., §141. See also *Blandy v. Griffith,* 3 Fisher 609, 616 (1869) the Court stating "invention is the work of the brain, and not the hands . . . the artisan who gives it reflex and embodiment in a machine is no more the inventor than the tools with which he wrought. Mere mechanical skill can never rise to the sphere of invention . . . . The mechanic may greatly aid the inventor, but he cannot usurp his place." In his *Treatise on the Law of Patents,* 1890, Robinson in Section 130 states that "it is the idea, and not the practical embodiment, which constitutes the essence of the invention and to which the protection of the patent is awarded." In *Corning v. Burden,* 15 How. 252, 267-68 (1853), it was stated, "A new process is usually the result of discovery . . . . One may discover a new and useful improvement in the process . . . irrespective of any particular mechanical device." In *Cochrane v. Deener,* 94 U.S. 780, 787-88 (1876), it was stated, "The machinery pointed out as suitable to perform the process may or may not be new or patentable . . . The process requires that certain things should be done with certain substances and in a certain order; but the tools to be used in doing this may be of secondary consequence."

[39] 409 U.S. 63, 175 U.S.P.Q. 673.

[40] 409 U.S. at 71, 175 U.S.P.Q. at 676.

[41] 409 U.S. at 64, 175 U.S.P.Q. at 674.

Note that Justice Douglas focused on the *claimed* subject matter and not solely on the mathematical formula. He did not dissect the claims. Presumably, if the claims had been limited to a particular art or technology or a particular end use, Douglas would have found patentable subject matter in the application of the formula. Lacking substantial practical application in his opinion, however, Douglas concluded that the patent would wholly pre-empt the mathematical formula, and in effect, would be a patent on the formula itself.

Douglas appeared to be saying that digital computer technology is not a particular art or technology in itself, that programming a computer is not a particular process or end use. This would be difficult to reconcile with the common understanding of computer technology. As Alvin Toffler said,

> Virtually every intellectual discipline . . . has been hit . . . by the invention and diffusion of the computer — and its full impact has not yet struck. And so the innovative cycle, feeding on itself, speeds up.

By the innovative cycle feeding on itself, Toffler meant that for computers to be combined in new ways they had

> . . . to be altered, adapted and refined or otherwise changed. So that the very effort to integrate machines into super machines compels us to make still further technological innovations.[42]

It is hard to deny that the art of computers and computer programming is a technology in itself. The *real* concern of Douglas was the use of a general purpose computer merely as a tool or means to calculate. In this manner, a computer is only a powerful calculator.

Rule of Benson. If the programmed computer is not directed to any particular end use (is merely a computing tool), the computer should not be the means to embellish an abstract idea or mathematical formula and serve it as patentable subject matter.

For example, assume a mathematical model of a business organization is developed, a mathematical model that improves the use of salesmen in the various territories of that organization. The business organization is an abstract entity and the mathematical model of the business organization is an abstract formula. These are non-patentable concepts. The mathematical model should not become patentable subject matter merely by using the computer to perform the calculation or analysis according to the mathematical relationship. The computer is only a tool.[43]

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[42] Alvin Toffler, *Future Shock,* 1970 pp. 29, 30.

[43] Some would assert that by programming the general purpose computer, one has

Take the example of a mathematical formula that has been developed to determine the best design for an amplifier circuit. The formula is an unpatentable abstract relationship. This abstract relationship should not become patentable subject matter merely by using the computer to perform the calculations. This is true even if the computer is the only way the complex calculations can be formed.

However, if the *claimed* invention is a *new circuit* having elements exhibiting the relationship as set forth in the mathematical formula, then the formula has been applied to a useful purpose. Following *Mackay Radio,* the circuit embodying the mathematical design is at least statutory subject matter.[44]

In a similar manner, a programmed computer is not merely a computing tool if the programmed computer is part of a useful process. The computations of the computer are steps in the process. As long as the process is in a useful art or technology, not limited to an abstract principle, it is patentable subject matter. We can speculate that in *Benson* the claim would have been patentable subject matter if the conversion technique was expressly linked in the claims to, for example, a telephone communication system.

In *Benson,* Justice Douglas relied on the teaching of *O'Reilly v. Morse,* 15 How. 62. The teaching in *Morse* was simply that a claim to a principle, without regard to the particular process with which it was connected, is not patentable subject matter. This was the interpretation given *O'Reilly v. Morse* by the Supreme Court in the *Telephone Cases*[45] and in *Tilghman.*[46] In short, the principle in the abstract is not patentable. This is basically the law of *Benson.* In *Benson,* however,

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invented a new machine. This is hard to accept since the general purpose machine is operated only as it was designed, built and intended to operate. It is difficult to believe that one who has only basic programming skills and absolutely no knowledge of computer hardware, by merely programming a general purpose computer, can be called the inventor of a new machine. The existing machine is operating only as intended.

[44] In *Scovill Mfg. Co. v. Satler,* 21 F.2d 630, 633 (District Court, Conn. 1927), the Court upheld a patent for an improved condensor. One claim expressed the relationship of the moveable plates of the condensor to the capacitance between the plates in terms of a mathematical equation. In response to the argument that the subject matter was merely a mathematical formula, the Court stated,

> The point is not well taken, because there can be no more objection to formulating a claim for a mechanical or electrical device in mathematical terms than there would be to write a claim for a chemical compound by means of chemical formulae. This is done every day in connection with highly important chemical inventions.

[45] 126 U.S. at 534.

[46] 102 U.S. at 725.

the law was extended to include, as non-statutory subject matter, the programming of a general purpose digital computer with no particular end use.

Diamond v. Diehr

The *Diehr*[47] case involved a rubber curing process. Over a century ago, Charles Goodyear discovered that the action of heat and sulphur converted crude rubber into a temperature resistant, mechanically strong commercial product. Although the process of curing rubber products in a mold has been undergoing continued refinement ever since, getting accurate cures on a uniform basis has still been a problem in the industry.

Achieving a perfect cure depends upon several factors, including the thickness of the article to be molded, the temperature of the molding press, and the amount of time that the article remains in the press. It is possible to calculate, by means of the Arrhenius equation,[48] when to open the press and remove the cured product.

There was a problem in the industry, however, in using the equation because the temperature of the molding press could not be precisely measured. This made it difficult to do the necessary computations to determine cure time. Because the temperature of the molding press had been considered an uncontrollable variable, the conventional industry practice had been to calculate the cure time as the shortest time in which all parts of the product were definitely cured. There was a deficiency in this practice. Inevitably, operating with an uncontrollable variable led to overcuring or undercuring the rubber.

Diehr et al *discovered* a method of obtaining accurate cures. The method was to constantly measure the temperature inside the mold. These temperatures were then automatically fed to a computer. The computer repeatedly re-calculated the cure time using the Arrhenius equation. When the re-calculated time equalled the actual time that had elapsed since the press was closed, the computer signaled a device to open the press.

The issue in the case, as in the *Flook* case, was only whether or not

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[47] Note 1, *supra*.

[48] The equation is named after its discoverer, Svante Arrhenius and is expressed:

$$\ln V = CZ + X$$

where $\ln V$ is the natural logarithm of V, the total required cure time, C is a unique activation constant for each batch of each compound being molded, determined in accordance with rheometer measurements of each batch (a rheometer is an instrument to measure flow of viscous substances), Z is the temperature of the mold, and X is a constant dependent on the geometry of the particular mold.

the invention was patentable subject matter. The *claimed* invention was a method of operating a rubber molding press that included computer calculating steps, but also included the steps of constantly determining the temperature of the mold and automatically opening the mold at the correct time.

Justice Rehnquist *focused* on the claimed invention. By stating that Diehr et al did not seek to patent a mathematical formula, he struck at the heart of the matter. Instead, according to Rehnquist, they sought patent protection for a process of curing synthetic rubber. Their process admittedly employed a well-known mathematical equation, but they did not seek to pre-empt the use of that equation. Rather, they sought only to foreclose from others the use of that equation in connection with all of the other steps in their claimed process. Obviously, according to Justice Rehnquist, one does not need a computer to cure natural or synthetic rubber. On the other hand, if the use of the computer in the process significantly lessened the possibility of overcuring or undercuring, the process as a whole did not therefore become unpatentable subject matter.

Recognizing that mathematical formulas are not patentable in the abstract but must be applied to a useful end, he summarized the law,

> Our earlier opinions lend support to our present conclusion that a claim drawn to subject matter otherwise statutory does not become non-statutory simply because it uses a mathematical formula, computer program or digital computer.[49]

The key issue is whether a process for curing synthetic rubber is patentable subject matter. The dissent, citing the Charles Goodyear patent on the vulcanization process, acknowledged that the Goodyear process for curing synthetic rubber is patentable subject matter.

It is hard to dispute that if Diehr et al had claimed the identical Goodyear process, the claimed invention would still be patentable subject matter. Of course, the process would be rejected as lacking novelty. Lacking novelty, nevertheless, would not authorize the rejection of the identical Goodyear process at the threshold under 35 USC 101 rather than 35 USC 102.

An improved rubber curing process, however, was claimed. The improved process is no less proper subject matter for a patent because a computer and computation are part of the process. Even if the essence of the process is calculating the time that the mold should remain closed by continually sampling the mold temperature, the process is still an improved process for curing rubber.

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[49] 67 L. Ed. 2d 155, 166, 209 U.S.P.Q. 1, 8.

It is no different to *directly* control heat to a process as done in *Neilson's* hot air blast or *Tilghman's* application of heat to dissolve fat, then *indirectly* by use of a computation to determine that the proper amount of heat has been applied. In fact, the dissent in *Diehr* read the claims as "an improved method of calculating the time that the mold should remain closed during the curing process."[50] Isn't controlling the time, in effect, controlling the heat applied. Isn't this an improvement in the control of a vital element of the process?

Maybe in *Diehr,* nothing was taught about the chemistry of the synthetic rubber curing process, nor anything taught about the raw materials to be used, nor about the particular compositions of material or mold configurations.

What the application did not teach, however, is not important. The important issue is what the application teaches and claims. By constantly measuring mold temperatures and automatically re-calculating required cure time in the computer, much better control over temperature and cure time is obtained. The result is a much more accurate process for curing synthetic rubber.

This is a valuable teaching in the art of curing synthetic rubber regardless of what the specification did not teach. It is this improvement to the process of curing synthetic rubber that is claimed and is proper subject matter for patenting under 35 USC 101.

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[50] 67 L. Ed. 2d 155, 177, 209 U.S.P.Q. 1, 17.

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COMMENTARY

A Note on Scandinavian Trademark Practice

I was shocked and pained to see my country, together with Denmark, Finland and Norway, mentioned as "pirate countries" in your article "Trademark Registration — What's The Use?" (IDEA, Vol. 23, No. 2, p. 52). As a matter of fact the legal system in these countries, which in this particular respect is identical, carries very efficient remedies to the kind of piracy you have in mind. May I refer you to section 14 para. 6 and 7 of our Trade Marks Act of 1960 (Industrial Property, Geneva 1962, p. 44.). Under these provisions I can assure you that any piracy or attempt at piracy, if properly countered by the rightful proprietor, would prove very costly indeed to the pirate. After the introduction of this legislation only very few case, if any at all, of piracy have occurred.

It would be appreciated if you could see your way somehow to remove our countries from footnote 24 of your article.

Claës Uggla, President
Swedish Court of Patent Appeals

PTC Research Report A SURVEY OF CORPORATE LICENSING*

BY MICHAEL D. ROSTOKER**

INTRODUCTION

The PTC Research Foundation conducted this study to determine and examine current patterns in the licensing agreements of United States corporations with respect to patents, know-how and trade secrets. A similar study, conducted by the PTC in 1968 (14 IDEA 1), focused specifically on foreign licensing by United States corporations, whereas the present study examines primarily domestic activity. The present survey provides both a convenient basis for comparison between the earlier survey results as well as an independent data base. To this end, the present format was adopted to aid in comparing the two existing licensing surveys as well as to permit meaningful comparison with future PTC sponsored surveys of licensing agreements, including a proposed study of current licensing methods practiced by private law firms.

The methodology of the survey required that a standard questionnaire be sent to 150 randomly selected United States corporations. The questionnaire categorized corporations by industry and total sales in 1980. Although the percentage of returned responses was not over-

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**Juris Doctor Candidate, Franklin Pierce Law Center, 1984. The author acknowledges earlier work on the survey data by David W. Highet, Franklin Pierce Law Center, Juris Doctor, 1982, and expresses appreciation to Teresa L. Weil, Franklin Pierce Law Center Juris Doctor, 1983 and to students in the 6.901 class of Patents and Innovation at the Massachusetts Institute of Technology for assistance in preliminary statistical review. Special thanks are extended to Robert Shaw, Director, The PTC Research Foundation; Nancy Metz, Entrepreneurial Workshop, Franklin Pierce Law Center; and Robert Rines, Academy of Applied Science for continuous support and advice.

whelming, reasonably valuable conclusions in terms of the sample can be drawn. Additionally, although no declaration as to statistical significance is given or implied, the foregoing data and conclusions do provide a sample of current licensing techniques in use today. Any use of the term "statistical" within this article relates only to trends and averages within the sample of responses to the questionnaire.

Returning to the survey, the questionnaire was designed to elicit some basic information relating to licensing agreements entered into within the past five years. Upon return of the questionnaires, the information was collated and analyzed. Any material which may have identified a particular respondent was removed to preserve anonymity.

With respect to the responses, the six industries that provided the greatest response were: chemical, electrical, mechanical, pharmaceutical, petroleum and transportation. Accordingly, the presentation and discussion of the material responses was separated into these categories. Companies which did not fit within these categories were reported in the "Other" category. Additionally, two companies did not respond to the question relating to the type of industry they were involved in, and they are reported in the "No Answer" category.

Many of the reporting companies were categorized as being involved in more than one field, and therefore their responses were reported more than once in the aforementioned categories. To provide a single entry format, an "All Reported" subdivision was prepared which lists individual responses to each question.

DATA CHARTS

In each of the data charts #1-17, appended at pages 76 to 92, the raw data responses were reported in specific order. For example, the first number reported in the section for the chemical industry in each of the charts #1-17 represents information from a single reporting company. The second number in each chart corresponds with the next reported chemical response, et cetera. For example Chart #1, the first row "Chemical", the numbers 10, 5, 3, and 3 for "As U.S. Licensor", "As Foreign Licensor", "As. U.S. Licensee" and "As Foreign Licensee" are the responses on the questionnaire of a single "Chemical" company.

In addition, the first response in each chart is from a single respondent; that is, in Charts #1, 2, 3, 4, and 8 the first response in each section is from the same participant in the survey. This applies also to the appropriate Chart #9-17.

As an example of the format of the charts, consider the responses from companies that designated themselves as being primarily involved in *transportation*. There were only four such reported companies and therefore they provide a useful size for an example.

Referring to Chart #1, which deals with the yearly average number of licenses signed, it can be noted that the (arbitrarily chosen) first reported transportation company claimed 20 domestic licenses as a licensor, 3 foreign licenses as a licensor, 3 domestic licenses as a licensee and no foreign licenses as a licensee. The second reported transportation company claimed 4 domestic licenses as a licensor, 11 foreign licenses as a licensor, 7 domestic licenses as a licensee and no foreign licenses as a licensee. Similar results follow for the other two reported companies. These numbers all represent an average over the last five year period.

Chart #2 deals with the approximate number of active United States patents owned in different areas of technology. The first reported transportation company, which corresponds to the first reported company in each chart, claimed 1300 mechanical, 300 electrical and 150 chemical patents, with no biological or other patents. The second reported company claimed 1817 mechanical and 1715 electrical patents, with no chemical, biological or other patents. The same procedure can be followed to determine values for the other reported companies.

Charts #3 and 4 relate to the total number of major licenses in force. The first reported transportation company, when referring to licenses with patent components, claimed 200 mechanical, 50 electrical, 10 chemical and no biological or other licenses. In reference to licenses with a know-how or trade secret component (Chart #4), the first company claimed no licenses at all. It must also be noted that the way the survey question was worded, exact correlations between Charts #3 and 4 are not feasible. As an example, the second reported transportation company reported having 147 mechanical and 147 electrical licenses with patent components and 147 mechanical and 147 electrical licenses with know-how/trade secret components. Although it might appear that only 147 licenses exist, each of which encompasses mechanical and electrical technology with both patent and trade secret components, the same reported values would exist if there were 588 total licenses: 147 mechanical patents, 147 electrical patents, 147 mechanical trade secrets and 147 electrical trade secrets or any ratio between the two noted extremes.

Chart #5 represents a divergence from the patterned responses by arbitrary numerical ordering, and instead provides a summarized table of results. Of the four reported transportation companies, one reported under $0.25 million, one between $0.25 to $1 million, and two transportation companies reported above $5 million as annual income from mechanical licenses. For electrical licenses, only two companies reported any annual license revenues, one between $0.25 to $1 million and one above $5 million. For chemical licenses, two companies re-

ported annual license revenues under $0.25 million. For biological and other licenses, no companies reported any annual income.

Charts #6 and 7 are also designed as summarized tables of results as to what methods of license payment are used. Of the four reported transportation companies, in response to the question about patent licenses in mechanical technology, three companies reported using paid-up licenses, three companies reported using a straight royalties method, all four companies reported using a down payment and royalties method and no companies reported the use of any other methods of license payment. Similar analysis is achieved for each of the categories in Chart #6 and Chart #7 by similar review.

Chart #8 returns to the format used in the first four charts, that of reporting actual raw data in a designated format. Relating to the average percentage of licenses paid in a particular manner, the first reported transportation company (which corresponds to the first reported transportation company in Charts #1-4) claimed the use of 5% paid-up licenses, 5% straight royalties, 90% down payment and royalties and 0% other types of license payment (total = 100%). The second reported transportation company (which corresponds to the second reported transportation company in Charts #1-4) claimed the use of 1% paid-up licenses, 94% straight royalties, 5% down payment and royalties and 0% other types of license payment (total = 100%). Similar results can be obtained by similar review of the other reported scores.

Finally, Charts #9 to 17 are raw data tabulated charts relating to specific industries. For review of the reported transportation companies only Chart #14 is necessary. When using a continuing royalty basis for payment, the first reported transportation company stated that, as based on percentage of sales, they would grant a 5% rate to mechanical patent licenses and a 3% rate to mechanical trade secret licenses, on the average. The second reported transportation company claimed that they would grant a 5-7% rate to mechanical trade secret licenses. Again, as with the other charts, similar review of the data presented in this chart would provide similar valuable information.

Following this section, a review of the responses to the survey with reference to the charts is provided with brief summaries highlighting significant patterns within each of the six industrial groups.

For the industrious researcher the appended charts can provide a data base in the form of an ordered structure which can be used to provide additional statistical results. For this purpose a copy of the survey is appended to this article; see pages 74-75, infra.

As a final note, the number "0" in the charts, as shown above, represents both a response of zero to a specific question, and a lack of

response to a question, as the author equates the two; for example, in Chart #1 "0" indicates no license in a particular category, but in Charts #9-16 a "0" means no response in a particular category.

OVERALL ANALYSIS

Of the 150 questionnaires mailed to corporations, 37 usable responses were received. Thirty-two of the thirty-seven companies reported sales of over $500 million, four companies reported sales between $10 million and $500 million, and only one company had sales less than $10 million for 1980. (See Question 1B of Survey.)

The primary purpose of the survey was to learn royalty rates for various industries. To this end, it can be seen in Charts #9-17 that the royalty rate ranges extended from a low of 0.2% of sales to a high of 35%, including a range for one company extending from 0.25% to 35% of sales.

The first question concerning licensing patterns asked the corporation to indicate in what role they had entered licensing agreements within the past five years. There were four possibilities: domestic licensor or licensee, and foreign licensor or licensee. As with each of the sets of data collated from the responses, this data provided a number of comparisons of which only the more outstanding are summarized. As might be expected, the overall data showed a strong tendency for United States corporations to enter licensing agreements more frequently with domestic firms than with foreign companies. The surveyed corporations licensed United States companies about twice as often as foreign concerns. They also took licenses from other United States corporations about three times as often as from foreign companies.

Because patents are one of the primary bases of many licensing agreements, and of considerable interest to the PTC Research Foundation, the next set of questions dealt with the number and type of active United States patents held by each corporation: chemical patents composed an overwhelming majority (47%), with electrical (24%), mechanical (23%) and biological (2%) patents involved in 96% of the licenses reported.

A further question concerning the subject matter of licensing agreements revealed that the majority (58%) contained both patent and know-how components. Another 32% of the licenses were strictly for patent rights, while only 10% were concerned solely with know-how.

The approximate annual income derived from licensing showed a much higher compensation for chemical licensing agreements with decreasing compensation for those in the mechanical, electrical and

biological fields, respectively. This fact, however, does not indicate that chemical licenses were more profitable generally, as data from the previous question disclosed substantially more chemical licensing agreements than all other types.

Another question concerned the methods of license compensation used by the surveyed corporations. A down payment with running royalties method was used 46% of the time, while straight royalties and paid-up licenses accounted for 39% and 13%, respectively. Other forms of compensation such as periodic lump sum payments, cross licensing, stock equities and royalty free licenses, although mentioned, were used an insignificant portion of the time (2%).

When the continuing royalties method of compensation was used, a lower percentage value basis for know-how licenses was charged than for patent licenses. This was true for the chemical, mechanical and pharmaceutical industries. In the electrical, petroleum and transportation industries, the average royalty percentage was almost identical for know-how licenses as for patent licenses.

INDUSTRY SUMMARIES

Chemical

Eleven of the 37 responses were from corporations in the chemical industry.

In domestic licensing agreements, chemical corporations were licensors about twice as often as they were licensees. In foreign licensing this average was almost four times as great. These corporations also entered domestic licensing agreements slightly over twice as often as they entered foreign licensing agreements.

As would be expected, these corporations held an overwhelming majority of their active United States patents in the chemical field (77%) with a reasonably even distribution over the remaining fields: mechanical (9%), electrical (8%), biological (4%) and other (2%). Additionally, since the chemical responses contained quite a number of joint chemical and pharmaceutical or petroleum responses, statistics were prepared in order to mask out the joint responses. Without considering the joint chemical — pharmaceutical responses the distribution of patents became: chemical (62%), mechanical (15%), electrical (13%), biological (6%), and other (3%). Masking out the joint chemical-petroleum responses yielded a patent distribution of chemical (78%), mechanical (9%), electrical (7%), biological (4%) and other (2%). Finally masking out both of the joint responses yielded a patent distribution of chemical (60%), mechanical (16%), electrical (13%), biological (7%) and other (4%). The general trend for patent distribution appeared to remain the same over each of the four sample groups

drawn from the pool of chemical responses. The fluctuation of numbers appeared to be more a result of individual vagaries present in the responding industries, rather than a new trend in patent distribution. As will be seen later, the above statistics compared well with the petroleum industry in general, although they were rather skewed in comparison with the almost totally chemical patent oriented pharmaceutical industry.

The chemical industry also was involved in a substantial number of licensing agreements spread across the range of patent and know-how components. The content or field of these licenses was in direct proportion to the reported ownership of such patents (with the exception of "other" licensing which appears to be all but non-existent.) Although the chemical industry was involved in more patent licensing agreements than know-how agreements, a substantial number of the patent agreements also contained á know-how component. Statistics in this area are not given since they would be rendered meaningless by the existence of a few widely variant responses.

The methods of compensation employed in chemical licensing agreements were primarily the three most prevalent methods of payment used (i.e. straight royalties, paid-up licenses, and down payment and royalties) while other methods of license payments were used almost not at all. The chemical companies chose to use the straight royalties method 39% of the time with decreasing importance given to the down payment and royalties (32%), paid-up licenses (23%), and other (6%) methods. The chemical companies, including the joint pharmaceutical and petroleum companies, appeared to make use of paid-up licenses about a quarter of the time, which was far above the percentage that this method was used in other industries. As to the other methods of licensing, the chemical industry was within the same overall industry ranges considering the deviation caused by the high proportion of paid-up licenses used.

As was true for most industries, the royalty rates for the chemical industry covered a wide range. Although review of the tabulated data in Charts #9-17 will reveal further information, certain generalities have been extracted. The largest range, as well as the highest values, generally, were for the chemical patent licenses. A few numerical values indicated reasonably high royalty rates for both electrical and biological patent licenses as well, but these did not form a general trend. Of substantial importance is the fact that the trade secret licenses generally commanded a far lower average royalty in comparison to patent licenses. Additionally, although there were few responses admitting the use of "other" license methods these few responses indicated reasonable recompense. Although the joint

chemical-pharmaceutical responses were within the normal chemical industry ranges for royalties, the joint chemical-petroleum responses provided some of the highest reported royalty rates. These high scores were not sufficient, considering their infrequency, to skew the overall results by any measurable amount.

Electrical

Nine of the 37 responses were from corporations in the electrical industry.

On the average, the electrical corporations were in the role of licensor about twice as often as they were a licensee, in both foreign and domestic markets. These electrical corporations were involved in United States licenses about twice as often as they were involved in foreign licenses as both licensors and licensees, respectively.

The majority of patents held by electrical corporations were in the electrical field (58%), with the remainder distributed through the chemical (22%), mechanical (19%), and biological (1%) fields. The licensing of patents and know-how followed a statistical trend directly proportional to the percentage of patents owned in each field. Additionally, most of the major licenses in force included both patent and know-how components with one industry response reporting more licenses for know-how in the electrical field than for electrical patents owned.

Again, as with the chemical industry, the three main methods of license payments chosen (straight royalties, paid-up and down payment with royalties) were well accepted, with almost no use of "other" methods. The favored license type was the straight royalties method (55%) with decreasing dependence given to downpayment and royalties (30%), paid-up licenses (14%) and other methods (1%).

The reported royalty rate ranges for the electrical industry revealed that the highest royalties were paid for electrical patent licenses with a close response for electrical know-how or trade secret licenses. The result is reasonable in light of the tendency of an industry to grant higher royalties in its primary field. Of note is the tremendous range (from 0.5% to 10% of sales) of royalties granted for mechanical patents and to a lesser extent, trade secret licenses. Again, as was true for most of the reported industries, trade secret licenses were generally awarded smaller percentages of royalties in comparison to patent licenses, although a few exceptions existed. Additionally, many electrical licenses were granted higher royalty rates by the electrical industry than were granted to chemical licenses by the chemical industry. However, this does not foster directly the conclusion that electrical licenses were more lucrative than chemical licenses.

Mechanical

Six of the 37 responses were from corporations in the mechanical industry.

As to licensing agreements, mechanical corporations were United States licensees about 1.5 times more often than they were licensors. This was the only instance in which a field of corporations were licensees more often than licensors. This pattern existed in one-half of the responses with such a magnitude that the normally distributed licensor-licensee responses were severely skewed. In the foreign market, mechanical corporations returned to the normal trend of being licensors approximately twice as often as they were licenses. Additionally, as licensors the mechanical corporations reported twice as many United States licenses as foreign licenses, with the proportion increasing to seven times the number of United States licenses as foreign licenses when the corporation acted as licensee.

The majority of patents held by mechanical corporations were in the mechanical field (65%) as expected, with an unexpected 25% of the patents being reported in "other" fields, followed by electrical (7%) and chemical (3%) patents, respectively. The high percentage of "other" patents overall was due primarily to a single very high response by one company that reported extreme diversity among the products it manufactured. Masking out the responses by that company reveals a more standard trend of mechanical (87%), electrical (7%), chemical (4%) and other (2%) patents owned.

The mechanical industry reported a very narrow scope of licensing. The overwhelming majority of reported major licenses were in the mechanical field with only a few licenses distributed throughout the remaining four fields. Approximately a third of the reported licenses contained a know-how component, well below the averages of the other industries.

As with the other industry types discussed, and in a positive correlative relationship to most of the reported scores, the mechanical industry indicated that it used the three main types of royalty methods with similar proportional frequency as with other industries and with less reliance on other methods of license payments. However, it should be noted that the mechanical industry reported a greater reliance on "other" methods of license payment in comparison with the other reported industries. The proportion of mechanical companies that used "other" methods was still substantially lower than those that reported the use of the three more common methods, but this significant variation from the norm warranted attention.

Although a higher proportion of mechanical responses reported the use of "other" methods of license payments, the percentages relating to

the actual use of each method followed produced a new deviation in the trend preferred by the previously reported industries. While both the chemical and electrical industries preferred a straight royalties method of payment with decreasing interest falling to the down payment and royalties and paid-up license methods, respectively, such was not the case in the mechanical industry. Based on the reported values, over half of the mechanical industries' licenses were compensated by the down payment and royalties method (55%), with straight royalties (33%), paid-up licenses (10%) and other methods (2%) providing the remainder.

Mechanical companies also followed the trend of rewarding mechanical patent licenses substantially more than trade secret licenses with, however, a few notable exceptions. Overall, the percentage royalties given to mechanical licenses were far higher than those awarded by the chemical and electrical industries for licenses in their major field.

Fewer chemical and electrical licenses were reported than from the chemical and electrical industries, respectively; however effectively equal royalty rates were given for these licenses as those given by the directly related industries. Overall, the mechanical industry appeared to provide the most lucrative of royalty ranges reported by any of the industries.

Pharmaceutical

Six of the 37 responses were from corporations in the pharmaceutical industry, of which half were also reported as members of the chemical industry.

In domestic and foreign licensing agreements pharmaceutical corporations were licensors about twice as often as they were licensees. Pharmaceutical corporations entered domestic licensing agreements about twice as often as they entered foreign licensing agreements. A masking out of the corporations reported as chemical and pharmaceutical revealed a substantially different result. The exclusively pharmaceutical corporations reported that in domestic licensing they were licensors about 1.5 times as often as they were licensees. In foreign licensing a radical deviation occurred in that the exclusively pharmaceutical industries reported they were licensees about 1.5 times as often as they were licensors. Such a pattern (i.e., being a licensee more often than licensor) occurred only one other time — in the reporting of domestic mechanical licensing. The deviation in reported method was due primarily to the majority of licenses having been reported by the joint chemical-pharmaceutical corporations. Since the joint chemical-pharmaceutical industry provided the majority of the re-

ported licenses, the results were skewed to a situation much closer to the standard chemical responses.

The overwhelming majority of patents owned by the pharmaceutical industry were chemical (96%) with but an insignificant number in the mechanical (2%), biological (1%) and other (1%) fields. The licensing practices were equally narrow in scope with substantially all of the reported licenses being in the chemical field, with most of the non-chemical licenses being reported by joint chemical-pharmaceutical corporations. Excluding a single extremely divergent response, most of the chemical licenses included a know-how as well as a patent component, while the few non-chemical licenses reported indicated less than one quarter contained know-how components.

As to the chosen methods of license payments the responses showed that preference was given to the use of the down payment and royalties method (used by all of the reporting companies) and the straight royalties method with about half of the reporting companies indicating the use of paid-up licenses. The down payment and royalties method was used most often (42%), with slightly less use of the straight royalties (33%) and the paid-up license (23%) methods and almost no use (only one corporation reported use) of other (2%) methods. The masking out of the joint chemical-pharmaceutical corporation responses resulted in substantially similar results.

The pharmaceutical industry, as with the associated chemical industry, provided the highest royalty rates to patent licenses followed by trade secret licenses in the chemical field. Of note however is the high range of reported license royalties for biological patents and trade secrets. Although the chemical industry also reported a few competitive royalty rate ranges for biological licenses, since the plethora of chemical responses did not report any use of such licenses, the results were not conclusive. Additionally, the average rates awarded to chemical licenses by the pharmaceutical industry were within effectively the same range as those awarded by the chemical industry. Such was not the case for the other chemically associated industry, petroleum, discussed below.

Petroleum

Four of the 37 responses were from corporations in the petroleum industry, of which half were also reported as members of the chemical industry.

In domestic licensing, petroleum corporations reported being licensors about twice as often as licensees. This ratio increased to more than four times as often that they were foreign licensors over licensees. Additionally, petroleum corporations were involved in domestic licenses

more than three times as often as they were involved in foreign licenses. Since the joint chemical-petroleum corporations provided the lower values in the reported scores, little deviation occurred due to idiosyncrasies in the chemical industry. Since masking the joint responses would leave only two companies with reported information, mathematical analysis under those circumstances would be meaningless.

Not much of a trend can be noted as to the responses involving the number of active United States patents owned, as each of the four responses were substantially different. On the average, however, petroleum corporations held a majority of their patents in the chemical field (65%) with the remainder distributed in decreasing proportion through the mechanical (18%), electrical (12%), other (4%) and biological (1%) fields. The lack of a definite trend between the reported companies also extended to responses relating to the number of major licenses in force. Even a direct relationship between each reporting industry's number of patents and licenses seemed to be lacking since half of the reporting corporations reported no patents in a particular field but claimed quite a number of licenses in that field. Such non-correlative responses were not present in any other industry's group response. As to the proportion of licenses with patent and know-how components, the responses ran the gamut from reports of a hundred mechanical licenses with exclusively patent components coupled with no know-how license at all, to another report of 20-25 exclusively know-how licenses with no patent or joint licenses reported. However, quite a number of responses showed a more common average of joint patent and know-how licenses. Overall, the information obtained from responses by the petroleum industry were not very conclusive.

The first effective correlation between the reported petroleum industry's responses occurred in the fairly common acceptance of the three "normal" methods of license payments with no reports of other payment methods used. On the average, the straight royalties method (34%) was the most popularly used method of license payment followed by the down payment and royalties method (29%), paid-up license method (19%) and other methods (18%), respectively.

The petroleum industry provided both the widest range of royalty rates and the highest ceilings on the average in comparison to all of the reported ranges by industries in the primary license field of each industry. The higher base rates awarded were by the joint chemical-petroleum industries while the high values were accepted evenly throughout. Again, as with the other reported industries in general, much higher royalties were normally paid for patent licenses in comparison to trade secret licenses in the same field. Only a few

non-chemical licenses were reported; any general analysis would be suspect in nature and is, therefore, omitted.

Transportation

Four of the 37 responses were from corporations in the transportation industry, of which half were also reported as members of the mechanical industry.

In domestic licensing, transportation corporations reported slightly more than twice as many licenses as a licensor rather than as a licensee. In foreign licensing only one response noted any action as a foreign licensee, and that for only a single license. Such a situation makes a trend analysis meaningless. Basically, it appears that domestic transportation corporations rarely if ever act as a foreign licensee. Additionally, they report overall involvement with domestic licenses slightly more than twice as often as they are involved in foreign licenses. As with the petroleum industry, masking would reduce the number of reported scores to a level too low for effective mathematical analysis, however there was little change when the joint mechanical-transportation responses were masked out to avoid possible skewed results.

The majority of patents owned by the transportation industry were mechanical (61%), followed by electrical (35%), and chemical (4%) patents. Masking out the joint mechanical-transportation responses revealed effectively identical results. As to the composition of major licenses in force, little correlation existed between the four responses. The range extended from all patent licenses to a majority of know-how licenses including those without patent components. No conclusive results are therefore indicated.

The questions relating to methods of license payment showed an acceptance of the three "normal" methods with a preference for the down payment and royalties method, with all four responses noting its use for mechanical licenses. As with the pharmaceutical industry, none of the transportation industry's responses noted the use of any method other than the common three. As to the use of these licenses, the preference clearly was for the down payment and royalties method (58%), followed by straight royalties (35%) and paid-up licenses (7%) respectively.

The transportation industry came very close to indicating substantially equal royalty rates for both mechanical and electrical licenses. Additionally, much less deviation existed between payments for patent versus trade secret or joint licenses. It must be noted that this trend was created by responses from the joint mechanical-transportation industries, although by masking out these responses the remaining

sample size would be too small for meaningful comparison. The overall response to the royalty rate questions compared well with the previously discussed mechanical industry, although none of the very high ranges were reported by the transportation industry.

CONCLUSIONS

An attempt was made in the overall analysis section and specific industry summaries to provide information as to trends and patterns within each reported industry and between related industries. Most of the data, however, is best reviewed in its raw tabulated form in the appended charts. Great care has been taken to keep each of the sets of responses in respective order so that readers of this article can perform any desired additional numeric analysis of the data base.

The only data withheld from this article is the list that correlates specific responses (which are single-entry listed in a predesignated order in the "All Reported" section of each chart) with what industry or industries they have identified themselves. The omission is intentional and is done to provide a measure of additional anonymity for the companies that responded to the survey.

Comments from corporate representatives also provided some useful information beyond the scope of the survey questions. Some of these responses provide general trends and notes of interest and therefore warrant some discussion. A common note from the chemical and petroleum industries indicated that they rarely differentiate between patent and know-how licenses as most of their licensing agreements contained both elements. In contrast to that custom was the pharmaceutical industry, which placed far less emphasis on know-how components in their licenses. In spite of the contrast, all three of these industries are interrelated in general nature with a majority of their active United States patents and licenses in the chemical field.

A comment from one corporate representative indicated that the great variation in royalty rates could be the result of a variety of factors including: whether the product was in its final form or was an intermediate product; whether the invention was a naked invention or fully developed; or whether the license was exclusive or non-exclusive.

Finally, one response noted that a substantial proportion of inter-corporate cross licensing is done in its industry. Far less use is made of the previously defined "standard" methods of licensing when dealing with other corporations.

In conclusion, although the survey provides an overview of licensing patterns in the corporate setting, and highlights some significant patterns, one of its more useful purposes is as a comparison and will be better realized with the publication of further research surveys of The

PTC Research Foundation. At this time, a similar survey is being prepared to be conducted among domestic law firms which organize licensing agreements for their clients. The results of that survey will be published in a forthcoming IDEA article.

THE PTC RESEARCH FOUNDATION

FRANKLIN PIERCE LAW CENTER

INDUSTRY SURVEY ON CURRENT COMPENSATION PATTERNS

FOR LICENSING OF PATENT AND KNOW-HOW (TECHNOLOGY) RIGHTS

1A. Please indicate the industry in which your firm is generally categorized (primary metals, transportation, electronic and electrical machinery, drugs, chemicals, biologicals, etc.)

_____

1B. Approximate total value of your company's sales in 1980:

_____ Under $10 million.
_____ From $100 to $500 million.
_____ Above $500 million.

1C. Approximate yearly average number of licenses signed within the past five years:

_____ As U.S. Licensor
_____ As Foreign Licensor
_____ As U.S. Licensee
_____ As Foreign Licensee

1D. Approximate total number of active U.S. patents owned by your company, including affiliates:

_____ Mechanical
_____ Chemical
_____ Other
_____ Electrical
_____ Biological

1E. Approximate total number of major licenses in force:

	PATENTS	KNOW-HOW/TRADE SECRETS
Mechanical	_____	_____
Electrical	_____	_____
Chemical	_____	_____
Biological	_____	_____
Other	_____	_____

1F. Approximate annual income derived from licensing:

	$0.25 Million and Under	$0.25 - 1 Million	$1 - 5 Million	Above $5 Million
Mechanical	_____	_____	_____	_____
Electrical	_____	_____	_____	_____
Chemical	_____	_____	_____	_____
Biological	_____	_____	_____	_____
Other	_____	_____	_____	_____

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2. What methods of payment are used by your licensees in your licensing agreements now in force? (Please check below.)

	Paid-Up License A	Royalties (continuing payments based on sales/use) B	Down Payment and Royalties C	Other (Specify) D
Patent Use:				
Mechanical	_____	_____	_____	_____
Electrical	_____	_____	_____	_____
Chemical	_____	_____	_____	_____
Biological	_____	_____	_____	_____
Other	_____	_____	_____	_____
Use of Know-How & Trade-Secrets:				
Mechanical	_____	_____	_____	_____
Electrical	_____	_____	_____	_____
Chemical	_____	_____	_____	_____
Biological	_____	_____	_____	_____
Other	_____	_____	_____	_____

3. What approximate percent of the licenses use methods A, B, C and D of Question #2?

A _____% B _____% C _____% D _____%

4. If you use a continuing royalty basis for payment, please indicate below the approximate royalty as based on percentage of sales or use (or range of percentages), or other value basis per unit, that is generally employed.

	Royalty (Percentage of Sales or Use or Value Basis Per Unit)
Patents:	
Mechanical	_____
Electrical	_____
Chemical	_____
Biological	_____
Other	_____
Trade Secrets:	
Mechanical	_____
Electrical	_____
Chemical	_____
Biological	_____
Other	_____
Other Types (Specify):	
Mechanical	_____
Electrical	_____
Chemical	_____
Biological	_____
Other	_____

CHART #1

YEARLY AVERAGE NUMBER OF LICENSES SIGNED

[Responses to Survey Question 1C]

INDUSTRY	As U.S. Licensor	As Foreign Licensor	As U.S. Licensee	As Foreign Licensee
Chemical	10/200/2/25/10/3/30/9/18/6-8/5	5/100/5/15/5/5/0/15/0/8-10/0	3/100/2/10/10/42/0/6/8/2-5/10/15	3/10/5/10/5/0/0/5/0/1-2/0
Electrical	3/7/10/1/2/100/5/3/10	2/1/25/1/0/40/0/2/5	7/2/5/0/0/40/3/6/3	2/0/3/0/0/22/0/3/3
Mechanical	3/5/10/2/2/1	2/5/1/1/2/0	6/2/20/0.5/2/3	3/0/0/0/1/1
Pharmaceutical	200/2/1/5/30/2	100/5/10/10/0/2	100/2/12-15/5/0/3	10/5/14-18/20/0/3
Petroleum	6-8/5/80/100	8-10/0/40/25	2-5/10-15/40/20	1-2/0/10/5
Transportation	20/4/2/2	3/11/1/2	3/7/0.5/2	0/0/0/1
Other	18/2/5/41/2/1	7/1/5/35/2/1	100/1/2/0/2/1	20/0/0/0/1/0
No Answer	2/10	5/5	5/20	2/5
All Reported	3/7/10/1/2/100/5/3/10/200/2/25/10/3/1/5/30/2/18/9/18/6-8/5/80/100/20/2/5/4/10/2/2/41/2/10/1/1	2/1/25/1/0/40/0/2/5/100/5/15/5/5/10/10/0/2/7/15/0/8-10/0/40/25/3/1/5/11/1/5/1/35/2/5/0/1	7/2/5/0/0/40/3/6/3/2/10/10/15/12-15/5/0/3/100/6/8/2-5/10-15/40/20/3/1/2/7/20/5/5/0/2/20/3/1	2/0/3/0/0/22/0/3/3/10/5/10/5/0/14-18/20/0/3/20/5/0/1-2/0/10/5/0/0/0/0/0/2/0/0/1/5/1/0

CHART #2

ACTIVE UNITED STATES PATENTS OWNED

[Responses to Survey Question 1D]

INDUSTRY	Mechanical	Electrical	Chemical	Biological	Other
Chemical	900/0/100/0/30/100/0/854/0/500/0	1200/0/0/0/0/10/0/367/0/500/0	2000/6800/100/0/70/300/4000/3635/1198/2000/500	50/0/100/0/0/0/0/780/0/25/0	0/0/100/0/0/50/0/383/0/0/0
Electrical	0/0/1000/30/0/1000/300/350/900	0/500/1500/175/500/6770/400/50/1200	0/0/100/0/0/2000/0/100/2000	0/0/0/1/0/100/0/0/50	0/0/0/0/0/0/0/80
Mechanical	350/100/3400/500/302/200	50/100/0/50/185/100	100/0/0/0/98/30	0/25/0/0/0/0	80/1750/0/0/0/0
Pharmaceutical	0/100/0/100/0/5	0/0/0/0/0/10	6800/100/100/1000/4000/1200	0/100/0/50/0/10	0/100/0/0/0/0
Petroleum	500/0/0/400	500/0/0/100	2000/500/0/700	25/0/0/0	0/0/0/200
Transportation	1300/1817/500/302	300/1715/50/185	150/0/0/98	0/0/0/0	0/0/0/0
Other	355/60/100/120/302/0	0/0/100/120/185/0	570/25/0/120/98/250	20/0/25/120/0/0/	5/0/1750/120/0/50
No Answer	100/1000	0/500	1000/3000	0/100	0/0
All Reported	0/0/1000/30/0/100/300/350/900/0/100/0/30/100/0/100/0/5/355/854/0/500/0/0/400/1300/60/100/1817/3400/100/600/120/302/1000/200/0	0/500/1500/175/500/6770/400/50/1200/0/0/0/0/10/0/0/0/10/0/367/0/500/0/0/100/300/0/100/1715/0/0/50/120/185/500/100/0	0/0/100/0/0/200/0/100/2000/6800/100/0/70/300/100/1000/4000/1200/570/3635/1198/2000/500/0/700/150/25/0/0/0/1000/0/120/98/3000/30/250	0/0/0/1/0/100/0/0/50/0/100/0/0/0/0/50/0/10/20/780/0/25/0/0/0/0/0/0/25/0/0/0/0/120/0/100/1/0	0/0/0/0/0/0/0/80/0/0/100/0/0/50/0/0/0/0/5/383/0/0/0/0/200/0/0/1750/0/0/0/0/120/0/0/0/50

CHART #3

TOTAL NUMBER OF MAJOR LICENSES IN FORCE
(Including Patent Components)

[Responses to Survey Question 1E]

INDUSTRY	Mechanical	Electrical	Chemical	Biological	Other
Chemical	5/0/0/10/10/3/0/6/ 10-25/0	15/0/0/0/0/0/0/1/ 0/10-25/0	28/700/50/30/30/5/ 70/33/70/100-125/0	3/0/20/0/0/0/40/6/ 0/0/0	1/0/0/0/0/0/0/ 10/0/0/0
Electrical	0/0/0/0/0/*/5/36/5	25/9/50/0/10/*/10/ 3/15	3/0/0/0/0/*/0/9/28	0/0/0/0/0/0/0/0/3	0/0/0/0/0/0/0/ 0/1
Mechanical	36/0/5/0/1/3	3/0/0/0/0/1	9/0/0/0/5/0	0/1/0/0/0/0	0/10/0/0/0/0
Pharmaceutical	0/0/0/15/0/0	0/0/0/0/0/0/	700/50/10/50/70/8	0/20/0/0/40/2	0/0/0/0/0/0
Petroleum	10-25/0/30/100	10-25/0/0/0	100-125/0/10/25	0/0/0/0	0/0/75**/0
Transportation	200/147/0/1	50/147/0/0	10/0/0/5	0/0/0/0	0/0/0/0
Other	27/30/0/28/1/0	0/0/0/28/0/0	115/8/0/28/5/25	2/0/1/28/0/0	3/0/10/28/0/0
No Answer	0/100	0/50	50/400	0/20	0/0
All Reported	0/0/0/0/0/*/5/36/5/ 0/0/10/10/3/0/15/ 0/0/27/6/0/10-25/ 0/30/100/200/30/ 0/147/5/0/28/1/ 100/3/0	25/9/50/0/10/*/10/ 3/15/0/0/0/0/0/0/ 0/0/0/0/1/0/10-25/ 0/0/0/50/0/0/147/ 0/0/28/0/50/1/0	3/0/0/0/0/*/9/0/ 28/700/50/30/30/ 5/10/50/7/8/115/ 33/70/100-125/0/ 0/25/10/0/0/0/0/ 50/28/5/400/0/25	0/0/0/0/0/0/0/0/3/ 0/20/0/0/0/0/0/40/ 2/2/6/0/0/0/0/0/0/ 0/1/0/0/0/28/0/20/ 0/0	0/0/0/0/0/0/0/ 0/1/0/0/0/0/0/ 0/0/0/0/3/10/0/ 0/0/75/0/0/0/ 10/0/0/0/28/0/ 0/0/0

* = Unusable response
** = Process

CHART #4

TOTAL NUMBER OF MAJOR LICENSES IN FORCE
(Including Know How/Trade Secret Components)

[Responses to Survey Question 1E]

INDUSTRY	Mechanical	Electrical	Chemical	Biological	Other
Chemical	5/0/0/10/0/10/0/7/ 0/10-25/0	15/0/0/0/0/0/0/27/ 0/10-25/0	25/50/30/15/0/20/ 10/29/55/100-125/0	3/0/10/0/0/0/5/21/ 0/0/0	1/0/0/0/0/0/0/ 1/0/0/0
Electrical	0/0/0/7/0/*/5/10/5	24/1/75/0/10/*/5/ 1/15	3/0/0/0/0/*/0/3/25	0/0/0/0/0/0/0/0/3	0/0/0/0/0/0/0/ 0/1
Mechanical	10/0/5/0/3/0	1/0/0/0/0/0	3/0/0/0/2/0	0/0/0/0/0/0	0/0/0/0/0/0
Pharmaceutical	0/0/0/0/0/0	0/0/0/0/0/0	50/30/10/50/10/8	0/10/0/0/5/2	0/0/0/0/0/0
Petroleum	10-25/0/30/0	10/25/0/0	100-125/20-25/10/0	0/0/0/0	0/0/0/0
Transportation	0/147/0/3	0/147/0/0	0/0/0/2	0/0/0/0	0/0/0/0
Other	0/3/0/28/3/0	0/0/0/28/0/0	12/0/0/28/2/15	0/0/0/28/0/0	0/0/0/28/0/0
No Answer	0/0	0/0	50/0	0/0	0/0
All Reported	0/0/0/7/0/*/5/10/5/ 0/0/10/0/10/0/0/0/ 0/0/7/0/10-25/0/ 30/0/0/3/0/147/5/ 0/28/3/0/0/0	24/1/75/0/10/*/5/1/ 15/0/0/0/0/0/0/0/ 0/0/0/27/0/10-25/ 0/0/0/0/0/0/147/0/ 0/28/0/0/0/0	0/0/0/0/0/*/0/3/25/ 50/30/15/0/20/10/ 50/10/8/12/29/55/ 100-125/20-25/0/ 0/0/0/0/0/0/50/28/ 2/0/0/15	0/0/0/0/0/0/0/0/0/3/ 0/10/0/0/0/0/0/5/ 2/0/2/0/0/0/0/0/0/ 0/0/0/0/0/28/0/0/ 0/0	0/0/0/0/0/0/0/ 0/1/0/0/0/0/0/ 0/0/0/0/0/1/0/ 0/0/75/0/0/0/ 0/0/0/0/28/0/ 0/0/0

* = Unusable Response

CHART #5

ANNUAL INCOME FROM LICENSING (Shown in Millions of Dollars)

	Mechanical				Electrical				Chemical				Biological				Other			
	Under 0.25	0.25 - 1.0	1.0 - 5.0	Above 5.0	Under 0.25	0.25 - 1.0	1.0 - 5.0	Above 5.0	Under 0.25	0.25 - 1.0	1.0 - 5.0	Above 5.0	Under 0.25	0.25 - 1.0	1.0 - 5.0	Above 5.0	Under 0.25	0.25 - 1.0	1.0 - 5.0	Above 5.0
Chemical	1	1	2	0	2	0	1	0	1	3	5	4	1	2	1	0	1	2	0	0
Electrical*	3	0	1	0	4	1	2	1	1	0	2	1	0	0	0	0	0	0	0	0
Mechanical	3	0	1	1	2	0	0	0	2	0	0	0	0	0	0	0	0	0	1	0
Pharmaceutical	0	0	0	0	0	0	0	0	0	1	2	3	0	1	0	0	0	1	0	0
Petroleum	0	2	0	1	2	0	0	0	0	1	0	3	1	0	0	0	0	0	0	1
Transportation	1	1	0	2	0	1	0	1	2	0	0	0	0	0	0	0	0	0	0	0
Other	3	0	0	0	0	0	0	0	2	0	2	0	1	0	0	0	0	0	0	0
No Answer	0	1	0	0	0	1	0	0	0	0	1	1	1	0	0	0	0	0	0	0
All Reported	8	4	3	3	7	3	2	3	6	4	10	8	4	2	1	0	2	2	1	1

[Responses to Survey Question 1F]

CHART #6

METHOD OF LICENSE PAYMENT
(Patent Licenses)

[Responses to Survey Question 2]

INDUSTRY	Mechanical				Electrical				Chemical				Biological				Other			
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
Chemical	5	4	3	0	3	3	3	1*	9	6	8	1	3	4	4	1	1	1	2	1
Electrical	4	4	3	1	6	8	5	1	3	3	3	1	0	0	0	0	0	0	1	0
Mechanical	5	4	5	2	1	2	1	1	0	1	2	1	0	0	1	0	0	0	1	0
Pharmaceutical	1	1	2	0	1	1	1	0	3	5	6	0	2	3	3	0	1	1	1	0
Petroleum	3	3	3	0	1	1	1	0	3	3	3	0	1	1	2	0	1	1	1	0
Transportation	3	3	4	0	1	2	2	0	0	0	2	0	0	0	0	0	0	0	0	0
Other	4	3	4	1	1	1	1	1	3	4	5	1	1	2	2	1	1	1	2	1
No Answer	1	1	1	0	1	1	1	0	2	2	2	0	0	0	1	0	0	0	0	0
All Reported	18	16	18	4	11	15	9	3	18	19	24	4	4	6	7	3	3	4	6	3

A = Paid Up License
B = Royalties
C = Downpayment and Royalties
D = Other

* = Stock equity

CHART #7

METHOD OF LICENSE PAYMENT
(Know How and Trade Secret)

[Responses to Survey Question 2]

INDUSTRY	Mechanical				Electrical				Chemical				Biological				Other			
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
Chemical	6	4	4	1	4	2	4	1*	11	10	10	1	2	3	3	0	2	1	2	0
Electrical	4	4	3	1	6	5	5	1	4	2	2	1	0	0	0	0	0	0	1	0
Mechanical	2	3	3	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
Pharmaceutical	1	1	1	0	1	1	1	0	3	5	6	0	1	2	3	0	1	1	1	0
Petroleum	2	2	2	0	0	0	0	0	3	3	3	0	0	0	0	0	1	1	1	0
Transportation	3	3	4	0	1	1	2	0	1	0	1	0	0	0	0	0	0	0	0	0
Other	3	2	3	1	1	1	1	1	3	2	3	1	1	1	1	1	1	1	1	1
No Answer	0	0	1	0	0	0	1	0	1	1	2	0	0	0	1	0	0	0	0	0
All Reported	16	15	14	4	12	9	10	5	20	17	19	4	2	4	5	3	4	3	3	2

A = Paid Up License
B = Royalties
C = Downpayment and Royalties
D = Other

* = Stock equity

CHART #8

AVERAGE PERCENTAGE OF LICENSES
(by Method)

[Responses to Survey Question 3]

INDUSTRY	Paid Up License	Royalties	Down Payment and Royalties	Other
Chemical	60/5/20/70/20/10/5/24/5/25/10	0/5/60/30/60/40/70/40/10/50/80	40/90/10/0/10/50/25/20/85/25/10	0/0/10/0/10/0/0/16/0/25/0
Electrical	10/0/0/0/0/2/25/10/60	20/100/0/100/50/98/50/20/0	70/0/0/0/50/0/25/60/40	0/0/0/0/0/0/0/10/0
Mechanical	10-12/10/10/25	30/0/86/40/0/50	6/100/10/50/90/25	10/0/2/0/0/0
Pharmaceutical	5/20/100/5/5/0	5/60/0/45/70/25	90/10/0/55/25/75	0/10/0/0/0/0
Petroleum	25/10/33/10	50/80/17/0	25/10/50/40	25/0/0/50
Transportation	5/1/10/10	5/94/40/0	90/5/50/90	0/0/0/0
Other	10/10/0/10/10/0	5/20/0/30/0/25	85/60/100/30/90/75	0/10/0/30/0/0
No Answer	10/15	25/15	65/70	0/0
All Reported	10/0/0/0/0/2/25/10 60/5/20/70/20/10/ 100/5/5/0/10/24/5/ 25/10/33/10/5/10/0/ 1/2/10/10/10/10/25/ 0	20/100/0/100/0/98/ 50/20/0/5/60/30/ 60/40/0/45/70/25/ 5/40/10/50/80/17/ 0/5/20/0/94/86/ 25/40/30/0/50/25	70/0/0/0/0/0/25/60 40/90/10/0/10/50/ 0/55/25/75/85/20/85/ 10/50/40/90/60/100/ 5/10/65/60/30/90/ 25/75	0/0/0/0/0/0/0/10/0/0/10/0/10/ 0/0/0/0/0/0/16/0/25/0/0/50/ 0/10/0/0/2/0/0/30/0/0/0

CHART #9

ROYALTY RATE RANGES: CHEMICAL INDUSTRY

(Percentage of Sales)

[Responses to Survey Question 4]

	Patent		Trade Secret		Other	
	Low	High	Low	High	Low	High
Mechanical	1/0/0.5/5/0/ 3/0/0/0/4/0	5/0/3/0/0/5/ 0/0/0/15/0	0/0/0.5/5/0/1/ 0/0/0/0/0	0/0/3/0/0/5/0/ 0/0/0/0	0/0/0.5/0/0/0/ 0/1/0/0/0	0/0/3/0/0/0/0/ 2/0/0/0
Electrical	3/0/0/0/0/0/0/ 0/0/4/0	6/0/0/0/0/0/0/ 1/0/15/0	0/0/0/0/0/0/0/ 0/0/0/0	0/0/0/0/0/0/0/ 1/0/0/0	0/0/0/0/0/0/0/ 0/0/0/0	0/0/0/0/0/0/0/ 1/0/0/0
Chemical	1/3/1/5/4/2/ 4/2/1/1/3	8/5/4/0/6/5/ 6/4/5/15/10	0/3/1/5/4/1/ 2/2/1/0/3	0/5/4/0/6/5/3/ 4/5/0/5	0/0/1/0/0/0/0/ 2/0/0/0	0/0/4/0/0/0/0/ 4/0/0/0
Biological	3/0/3/0/0/0/ 7/2/0/0/0	10/0/6/0/0/0/ 8/8/0/0/0	0/0/3/0/0/0/2/ 2/0/0/0	0/0/6/0/0/0/3 8/0/0/0	0/0/3/0/0/0/0/ 2/0/0/0	0/0/6/0/0/0/0/ 8/0/0/0
Other	0/0/4/0/0/0/0/ 0/0/0/0	0/0/8/0/0/0/0/ 0/0/0/0	0/0/4/0/0/0/0/ 0/0/0/0	0/0/8/0/0/0/0/ 0/0/0/0	0/0/4/0/0/0/0/ 1/0/0/0	0/0/8/0/0/0/0/ 2/0/0/0

CHART #10

ROYALTY RATE RANGES: ELECTRICAL INDUSTRY

[Responses to Survey Question 4]

(Percentage of Sales)

	Patent		Trade Secret		Other	
	Low	High	Low	High	Low	High
Mechanical	0/0/0/2/0/1/ 0.2/0.5/1	0/0/0/0/0/5/ 5/10/5	0/0/0/2/0/1/ 0.2/0.5/0	0/0/0/0/0/6/5/ 5/0	0/0/0/2/0/0/0/ 0/0	0/0/0/2/0/0/0/ 0/0
Electrical	3/2/2/5/1/1/2/ 0.5/3	7/0/3/0/17/5/ 5/10/6	3/0/8/5/1/1/0/ 5/0	7/0/0/0/12/11/ 0/5/0	0/0/0/5/0/0/0/ 0/0	0/0/0/5/0/0/0/ 0/0
Chemical	2/0/0/0/0/1/0/ 3/1	6/0/0/0/0/5/ 0/10/8	2/0/0/0/0/1/0/ 3/0	6/0/0/0/0/6/0/ 0/0	0/0/0/0/0/0/0/ 0/0	0/0/0/0/0/0/0/ 0/0
Biological	1/0/0/0/0/0/ 0/0/3	3/0/0/0/0/0/ 0/0/10	0/0/0/0/0/1/0/ 0/0	0/0/0/0/0/6/0/ 0/0	0/0/0/0/0/0/0/ 0/0	0/0/0/0/0/0/0/ 0/0
Other	0/0/0/0/0/0/0/ 0/0	0/0/0/0/0/0/ 0/0/0	0/0/0/0/0/0/0/ 0/0	0/0/0/0/0/0/0/ 0/0	0/0/0/0/0/0/0/ 10/0	0/0/0/0/0/0/0/ 30/0

CHART #11

ROYALTY RATE RANGES: MECHANICAL INDUSTRY

[Responses to Survey Question 4]

(Percentage of Sales)

	Patent		Trade Secret		Other	
	Low	High	Low	High	Low	High
Mechanical	0.5/0/5/5/3/3	10/0/20/5/5/5	0.5/0/2/0/5/0	5/0/3/0/10/0	0/0/0/0/0/0	0/0/0/0/0/0
Electrical	0.5/0/0/0/0/3	10/0/0/0/0/5	0.5/0/0/0/0/0	5/0/0/0/0/0	0/0/0/0/0/0	0/0/0/0/0/0
Chemical	3/0/0/0/3/0	10/0/0/0/3/0	3/0/0/0/2/0	3/0/0/0/2/0	0/0/0/0/0/0	0/0/0/0/0/0
Biological	0/2/0/0/0/0	0/5/0/0/0/0	0/0/0/0/0/0	0/0/0/0/0/0	0/0/0/0/0/0	0/0/0/0/0/0
Other	0/3/0/0/0/0	0/8/0/0/0/0	0/0/0/0/0/0	0/0/0/0/0/0	10/0/0/0/0/0	30/0/0/0/0/0

CHART #12

ROYALTY RATE RANGES: PHARMACEUTICAL INDUSTRY

[Responses to Survey Question 4]

(Percentage of Sales)

	Patent		Trade Secret		Other	
	Low	High	Low	High	Low	High
Mechanical	0/0.5/0/0/0/0/	0/3/0/0/0/0	0/0.5/0/0/0/0	0/3/0/0/0/0	0/0.5/0/0/0/0	0/3/0/0/0/0
Electrical	0/0/0/0/0/0	0/0/0/0/0/0	0/0/0/0/0/0	0/0/0/0/0/0	0/0/0/0/0/0	0/0/0/0/0/0
Chemical	3/1/7/5/4/1	5/4/7/10/6/15	3/1/3/2/2/1	5/4/3/5/3/5	0/1/0/0/0/0	0/4/0/0/0/0
Biological	0/3/0/0/7/1	0/6/0/0/8/6	0/3/0/0/2/1	0/6/0/0/3/5	0/3/0/0/0/0	0/6/0/0/0/0
Other	0/4/0/0/0/0	0/8/0/0/0/0	0/4/0/0/0/0	0/8/0/0/0/0	0/4/0/0/0/0	0/8/0/0/0/0

CHART #13

ROYALTY RATE RANGES: PETROLEUM INDUSTRY

[Responses to Survey Question 4]

(Percentage of Sales)

	Patent		Trade Secret		Other	
	Low	High	Low	High	Low	High
Mechanical	4/0/0*/2	15/0/3*/10	4/0/0*/0	15/0/3*/0	0/0/0/0	0/0/0/0
Electrical	4/0/0/0	15/0/0/0	4/0/0/0	15/0/0/0	0/0/0/0	0/0/0/0
Chemical	1/3/0.5/1.5	15/10/10*/10	1/3/0.5*/0	15/5/10*/0	0/0/0/0	0/0/0/0
Biological	0/0/0/0	0/0/0/0	0/0/0/0	0/0/0/0	0/0/0/0	0/0/0/0
Other	0/0/0*/0	0/0/3*/0	0/0/0*/0	0/0/3*/0	0/0/0/0	0/0/0/0

* = Patent and Trade Secret Combined

CHART #14

ROYALTY RATE RANGES: TRANSPORTATION INDUSTRY

[Responses to Survey Question 4]

(Percentage of Sales)

	Patent		Trade Secret		Other	
	Low	High	Low	High	Low	High
Mechanical	5/5/5/3	5/7/5/5	3/3/5/5	3/5/5/10	0/0/0/0	0/0/0/0
Electrical	5/5/0/0	5/7/0/0	3/3/0/0	3/5/0/0	0/0/0/0	0/0/0/0
Chemical	5/0/0/3	5/0/0/3	3/0/0/2	3/0/0/2	0/0/0/0	0/0/0/0
Biological	0/0/0/0	0/0/0/0	0/0/0/0	0/0/0/0	0/0/0/0	0/0/0/0
Other	0/0/0/0	0/0/0/0	0/0/0/0	0/0/0/0	0/0/0/0	6/0/0/0

CHART #15

ROYALTY RATE RANGES: OTHER INDUSTRIES

[Responses to Survey Question 4]

(Percentage of Sales)

	Patent		Trade Secret		Other	
	Low	High	Low	High	Low	High
Mechanical	4/0.25/0/3/3/0	4/35/0/7/5/0	3/0/0/3/5/0	3/0/0/7/10/0	0/0/0/0/0/0	0/0/0/0/0/0
Electrical	0/0/0/3/0/0	0/0/0/15/0/0	0/0/0/3/0/0	0/0/0/15/0/0	0/0/0/0/0/0	0/0/0/0/0/0
Chemical	6/1/0/2/3/1	6/7/0/8/3/5	4/0/0/2/2/1	4/0/0/8/2/5	0/0/0/0/0/0	0/0/0/0/0/0
Biological	0/0/2/1.5/0/0	0/0/5/15/0/0	0/0/0/1.5/0/0	0/0/0/15/0/0	0/0/0/0/0/0	0/0/0/0/0/0
Other	0/0/0/0/0/0	0/0/0/0/0/0	0/0/0/0/0/0	0/0/0/0/0/0	0/0/0/0/0/0	0/0/0/0/0/0

CHART #16

ROYALTY RATE RANGES: NO ANSWER

[Responses to Survey Question 4]

(Percentage of Sales)

	Patent		Trade Secret		Other	
	Low	High	Low	High	Low	High
Mechanical	0/1	0/5	0/1	0/4	0/0	0/0
Electrical	0/1	0/5	0/1	0/4	0/0	0/0
Chemical	1*/3	3*/10	1*/1	3*/10	0/0	0/0
Biological	0/3	0/10	0/0	0/0	0/0	0/0
Other	0/0	0/0	0/0	0/0	0/0	0/0

* = Combined Patent and Trade Secret

CHART #17

ROYALTY RATE RANGES: ALL REPORTED INDUSTRIES
(Percentage of Sales)

[Responses to Survey Question 4]

	Patent		Trade Secret		Other	
	Low	High	Low	High	Low	High
Mechanical	0/0/0/2/0/1/0.2/0.5/1/ 0/0.5/5/0/3/0/0/0/0/4/ 0/0/4/0/0/2/5/0.25/0/ 5/5/0/0/5/3/3/3/0	0/0/0/2/0/5/5/10/5/ 0/3/5/0/5/0/0/0/0/ 4/0/0/15/0/3*/10/0/ 35/0/7/20/0/0/5/7/ 5/5/0	0/0/0/2/0/1/0.2/0.5/ 1/0/0.5/5/0/1/0/0/0/ 0/3/0/0/4/0/0/3/0/ 0/3/2/0/0/0/3/5/0/0	0/0/0/2/0/6/5/5/ 5/0/0/3/5/0/5/0/0/ 0/0/3/0/0/15/0/3*/ 0/3/0/0/5/3/0/0/ 0/7/10/0/0	0/0/0/0/0/0/0/0/ 0/0/0/0/0/0/0/0/ 0/0/0/0/0/0/0/0/ 0/0/0/0/0/0/0/0/ 0/0/0/0/0	0/0/0/0/0/0/0/0/ 0/0/0/0/0/0/0/0/ 0/0/0/0/0/0/0/0/ 0/0/0/0/0/0/0/0/ 0/0/0/0/0
Electrical	3/2/2/5/1/1/2/0.5/3/ 0/0/0/0/0/0/0/0/0/ 0.5/0/4/0/0/0/5/1/0/ 5/0/0/0/0/3/0/3/0	7/2/3/5/17/5/5/10/ 6/0/0/0/0/0/0/0/0/ 0/0/0.5/0/15/0/0/ 0/5/7/0/7/0/0/0/0/ 15/0/5/0	3/0/8/5/1/1/0/0.5/ 3/0/0/0/0/0/0/0/0/ 0/0/0.5/0/4/0/0/0/ 3/0/0/3/0/0/0/0/3/ 0/0/0	7/0/8/5/12/11/0/ 5/6/0/0/0/0/0/0/ 0/0/0/0/0/5/0/15/ 0/0/0/3/0/0/5/0/ 0/0/0/15/0/0/0	0/0/0/0/0/0/0/0/0/ 0/0/0/0/0/0/0/0/0/ 0/0/0/0/0/0/0/0/0/ 0/0/0/0/0/0/0/0/0/ 0	0/0/0/0/0/0/0/0/0/ 0/0/0/0/0/0/0/0/0/ 0/0/0/0/0/0/0/0/0/ 0/0/0/0/0/0/0/0/0/ 0
Chemical	2/0/0/0/0/1/0/3/1/3/ 1/5/4/2/7/5/4/1/6/2/ 1/1/3/0.5*/1.5/5/0/ 0/0/0/0/1/0/2/3/0/1	6/0/0/0/0/5/0/10/8/ 5/4/5/6/5/7/10/6/ 15/6/4/5/15/10/10*/ 10/5/0/0/0/0/0/3/9/ 8/3/0/5	2/0/0/0/0/1/0/3/1/ 3/1/5/4/1/3/2/2/1/ 4/2/1/1/3/0.5/0/3/ 0/0/0/0/0/1/0/2/2/ 0/1	6/0/0/0/0/6/0/3/ 0/5/4/5/6/5/3/5/ 3/5/4/4/5/15/5/ 10/0/3/0/0/0/0/0/ 3/0/8/2/0/5	0/0/0/0/0/0/0/0/0/ 0/0/0/0/0/0/0/0/0/ 0/0/0/0/0/0/0/0/0/ 0/0/0/0/0/0/0	0/0/0/0/0/0/0/0/0/ 0/0/0/0/0/0/0/0/0/ 0/0/0/0/0/0/0/0/0/ 0/0/0/0/0/0/0/0/0/ 0
Biological	0/0/0/0/0/1/0/0/3/0/ 3/0/0/0/0/0/7/1/0/2/ 0/0/0/0/0/0/0/2/0/0/ 0/0/0/1.5/0/0/0	0/0/0/0/0/5/0/10/0/ 6/0/0/0/0/0/8/8/0/ 8/0/0/0/0/0/0/0/5/ 0/0/0/0/0/15/0/0/0	0/0/0/0/0/1/0/0/3/ 0/3/0/0/0/0/0/2/1/ 0/2/0/0/0/0/0/0/0/ 0/0/0/0/0/0/1.5/0/ 0/0	0/0/0/0/0/6/0/0/ 10/0/6/0/0/0/0/0/ 3/5/0/8/0/0/0/0/ 0/0/0/0/0/0/0/0/ 0/15/0/0/0	0/0/0/0/0/0/0/0/0/ 0/0/0/0/0/0/0/0/0/ 0/0/0/0/0/0/0/0/0/ 0/0/0/0/0/0/0	0/0/0/0/0/0/0/0/0/ 0/0/0/0/0/0/0/0/0/ 0/0/0/0/0/0/0/0/0/ 0/0/0/0/0/0/0/0/0/ 0
Other	1/0/0/0/0/0/0/0/0/0/ 4/0/0/0/0/0/0/0/0/ 0/0/0/0/0/0/0/0/0/ 0/0/0/0/0/0/0	3/0/0/0/0/0/0/0/0/ 0/8/0/0/0/0/0/0/0/ 0/0/0/0/0/3*/0/0/0/ 0/0/0/0/0/0/0/0/0/ 0	0/0/0/0/0/0/0/0/0/ 0/8/0/0/0/0/0/0/0/ 0/0/0/0/0/0/0/0/0/ 0/0/0/0/0/0/0/0/0/ 0	0/0/0/0/0/0/0/0/ 0/0/8/0/0/0/0/0/ 0/0/0/0/0/0/0/3*/ 0/0/0/0/0/0/0/0/ 0/0/0/0/0	0/0/0/0/0/0/0/0/0/ 0/0/0/0/0/0/0/0/0/ 0/0/0/0/0/0/0/0/0/ 0/0/0/0/0/0/0	0/0/0/0/0/0/0/0/0/ 0/0/0/0/0/0/0/0/0/ 0/0/0/0/0/0/0/0/0/ 0/0/0/0/0/0/0/0/0/ 0

*Patent and Trade Secret Combined.

A COMPARISON OF COPYRIGHT PROTECTION OF UTILITARIAN DESIGNS IN THE UNITED STATES AND THE UNITED KINGDOM

ROBERT L. TUCKER*

In any country where the concept of copyright has been adopted, laws have been enacted to give the originator rights and remedies to keep his work from being copied. Such countries have great similarities in concept and, to a laymen's point of view, the subtleties of the different jurisdictions might seem trivial and a mere consequence of various authors. However, this is not so, and a legally trained mind will note that the first sentence of this paragraph is overbroad and ambiguous. The first concept needing definition is *who* is considered a creator, followed by an explanation of what specific *rights* he receives (including a definition of an infringement) and finally what is considered a *work*.

Ever evolving technology, from the printing press to the laser disc, has forced legislatures to revise copyright laws to include new types of works and re-define the rights of their creators. Universal Copyright Conventions (e.g., Paris, 1971) have sought to internationalize copyright laws with participating countries agreeing to recognize and honor fellow members' laws.

Despite various revisions and cooperative movements, there still seem to be fundamental differences between many of the systems, as for example, between the systems of the United States and the United Kingdom. One such difference involves the degree and type of protection offered unpatentable utilitarian industrial designs.

*Franklin Pierce Law Center
Juris Doctor 1983

United Kingdom copyright laws provide protection for unpatentable utilitarian works by defining a copyright infringement to include a three-dimensional manifestation of the two-dimensional copyrighted design. United States copyright laws explicitly prohibit protection for utilitarian works.[1] This journal article will review the copyright laws of the United States and the United Kingdom and compare the respective laws regarding utilitarian designs.

DEVELOPMENT OF COPYRIGHT PROTECTION

Early British copyright protection took the form of printers licenses. In 1562 licenses were declared void "[i]f any other had a right"[2] and this gave rise to a system of registering copies in 1573. In 1649 Parliament created a remedy against the reprinting of registered books (money and forfeiture of the books); "[i]n 1662 it added the requirement of deposit of a copy at the Kings Library and at each of the Universities".[3] In addition, a copy was required to be deposited at the time of registration. These acts lapsed and were revived with changing monarchs until 1710 when the Statute of Anne was passed "for the encouragement of learning".[4] Present United Kingdom and United States copyright law descends from the Statute of Anne with myriad changes and revisions most of which do not concern us at this time. This article will be confined only to provisions regarding copyright protection of industrial designs.

United States copyright law had been quick to prohibit protections to drawings of mechanical designs but British copyright law, by allowing this type of copyright protection, created far-reaching monopolies for three-dimensional products drawn in copyrighted blueprints. Parliament found it troublesome that mechanical and non-mechanical industrial designs (i.e., fabric prints) were receiving such strong monopolies through copyright protection. To remedy this, it enacted a limited monopoly, in the form of a registered design. The requirements for the registered design, however, excluded designs for mechanical

[1] 37 C.F.R. §202.10(c).

[2] R.R. BOWKER, COPYRIGHT ITS HISTORY AND ITS LAW, 21 (1921) (hereinafter cited as Bowker).

[3] *Id.* at 21.

[4] *Id.* at 23. Statute of Anne: Clause 1 "[f]rom the 10th April 1710 the author of any book already printed who shall not have transferred the right shall have the sole right and liberty of printing such book for the term of 21 years to commence from the said 10th day of April, and no longer, and the author of any book not yet printed and his assigns shall have a similar right for fourteen years from first publication and no longer". R.F. WHALE, COMMENT ON COPYRIGHT (1969).

objects, which still allowed these products to be manufactured under a copyright monopoly. It is this author's contention that Parliament tried to use the registered design to eliminate copyright protection of industrial designs but failed, through oversight, to limit the protection afforded mechanical designs. This article will trace the chronological efforts of Parliament and the judiciary's resultant resistance to change.

PROTECTION OF INDUSTRIAL DESIGNS

In 1842 Parliament passed a Copyright and Designs Act which covered designs for articles of manufacture and consolidated previous bills from the period of 1787 to 1839 which dealt with fabric designs and manufactured articles.[5]

In the U.S., "[i]t is provided by the Act of May 9, 1902 that 'any new, original and ornamental design for an article of manufacture' may be patented, and the classification inferentially excludes such designs from copyright".[6] The U.S. Copyright Act of 1909 allowed protection on: models or designs for works of art, and drawings or plastic works of a scientific or technical character.[7] To explain this section the Copyright Office promulgated sections 12 and 16 of the 1910 Rules and Regulations which read, in part,

> Works of art. — This term includes all works belonging fairly to the so-called fine arts (paintings, drawings and sculpture).
>
> Production of the industrial arts utilitarian in purpose and character are not subject to copyright registration, even if artistically made or ornamented.[8]
>
> Articles of utilitarian purpose do not become capable of copyright registration because they consist in part of pictures which in themselves are copyrightable.[9]

Soon after the passage of the U.S. Copyright Act of 1909, an Imperial Copyright Conference was held in London with the goal of adopting an English code similar to the newly enacted American code. Passed by Parliament in 1912, the Act provided that "'designs capable of being registered under the Patents and Designs Act of 1907' are specifically excepted under clause 22 of the proposed code".[10]

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[5] *Id.* at 29.

[6] *Id.* at 93.

[7] Sections 5(g) and 5(i) of The 1909 Copyright Act.

[8] Section 12(g) of The 1910 Copyright Rules and Regulations.

[9] Section 16(k) of The 1910 Copyright Rules and Regulations.

[10] BOWKER at 34.

Clause 22 of the British Copyright Act of 1911 states:

> [t]his Act shall apply to designs capable of being registered under the Patents and Designs Act, 1907, except designs which, though capable of being so registered, are not used or *intended* to be used as models or patterns to be multiplied by any industrial process. (Emphasis added.)

"The intention (of clause 22) was that art applied industrially or intended to be applied industrially should receive protection under the Registered Designs legislation or not at all".[11]

In *King Features Syndicate v. O. & M. Kleeman,*[12] however, "the House of Lords held that 'intention' (in clause 22) meant the intention of the author at the moment of creating the work and in that case since he did not have any such intention to apply the work industrially, clause 22 did not operate so as to exclude copyright under the 1911 Act."[13] Lord Maugham held in *King Features* that:

> [t]here is nothing in the section (clause 22) to suggest that a copyright gained by an author under the Act is to be terminated or destroyed at some later date. The words "not used or intended to be used" in the context seem to point to a condition upon which a copyright under the Act of 1911 may be acquired in the first instance. It would be almost impossible to apply the section if the copyright might be terminated long after it came into existence by the mere intention to use the work as a model or pattern either of the author or of someone deriving some right from him. How can one apply the section if the copyright is to cease to exist on the formation of an undisclosed intention at a date after the copyright has come into existence? On the other hand, it does appear to be a possible view that the legislature thought that it would not be very difficult to ascertain, when the author of a design (or the drawing from which the design was made) had completed his work, whether he intended it simply as a work of art or as a model or pattern to be multiplied by an industrial process — in other words, whether or not he regarded it as a species of commercial enterprise. It does not seem to have occurred to the draftsman, if we may judge from the terms of the section, that the artist might have mixed intentions, or that, having created an artistic work, he or his executors might desire at some future day to industrialize the work and to cause it to be multiplied in articles to which it was capable of being applied. I am far from suggesting that the section is an example of perfect drafting. I am content to say that I can find no words which point to the view that section 22 is contemplating a terminable copyright.[14]

The effect of this interpretation of section 22 is that designs which do not meet the requirements for design registration will gain longer protection (through copyright) than those that do.[15] It appears as if

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[11] Moon, Copyright in Artistic Works: The extension of mechanical design, NEW ZEALAND LAW JOURNAL 282-8 (1979) (hereinafter cited as Moon).

[12] [1941] 58 R.P.C. 207.

[13] *Id.*

[14] King Features Syndicate v. O. & M. Kleeman, [1941] 58 R.P.C. 207.

[15] Cornish, Cumulative Protection for Industrial Designs, 8 U.B.C. LAW REVIEW 219 at 227 (1973).

Parliament's legislative intent was foiled by the judiciary in *King Features* with the result that U.K. copyright continued to give added protection to industrial designs.

The superseding U.K. Copyright Act of 1956 attempted to correct this situation by dropping the "intention" test and adding section 10 which prohibited a copyright infringement, "to be allowed on anything which would have been within the scope of the copyright in the design if the design had, immediately before that time, been registered in respect of the relevant articles 'and the design has been applied industrially by the owner.'"[16] Section 10 was enacted to reduce the possibility that an industrial design would be protected by both copyright and design registration.[17]

Registration of the design was covered by the Registered Designs Act, 1949, which "gave to the registered proprietor the copyright in the registered design . . . to make or import for sale, or for use for the purposes of any trade or business, or to sell, hire or offer for sale or hire, any article in respect of which the design is registered"[18], "as well as the exclusive right to make anything which enables such articles to be made anywhere in the world (e.g. formers, patterns, stencils)."[19] "Design" was defined as meaning:

> [f]eatures of shape, configuration, pattern or ornament applied to an article by any industrial process or means, being features which in the finished article appeal to and are judged solely by the eye, but does not include a method or principle of construction or features of shape, or configuration which are dictated solely by the function which the article to be made in that shape or configuration has to perform.[20]

In addition, to qualify for registration, the design must be "novel", having never been used industrially before it was used artistically.[21]

The effect of the U.K. Copyright Act of 1956 and the U.K. Registered Designs Act of 1949 is that an industrial design is afforded full copyright protection until used industrially and then the owner or an assignee must register the application of the design under the Designs Act. Once registered, the design is protected for a *specific* industrial application for a maximum of 15 years while still maintaining copyright protection in respect to *other* uses. The design may be subse-

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[16] Moon at 282-8.

[17] [1956] Current Law Year Book 1584.

[18] E.P. SKONE JAMES, COPINGER AND SKONE JAMES ON COPYRIGHT, at 90 (1980) (hereinafter cited as Skone James, 1980).

[19] M.F. FLINT, A USER'S GUIDE TO COPYRIGHT, at 68 (1979).

[20] *Id.*

[21] *Id.* at 69.

quently registered for other industrial applications but only for the original period. Upon expiration of the original registration under the U.K. Designs Act, copyright protection continues but only in regard to non-industrial uses.[22]

Industrial use, which means reproduction on or in more than fifty articles not together constituting a single set, or to goods manufactured in lengths or pieces other than hand-made goods,[23] required that the design be registered and curtailed copyright protection on *that* industrial article. The 1956 Act thus ended *copyright* protection for industrial designs. Parliament appeared thus to have remedied the situation created by *King Features Syndicate*.[24]

Section 10 of the Copyright Act of 1956, however, addressed only designs which had been or are capable of design registration. This excluded configurations whose shape was dictated solely by function,[25] which is true of most mechanical designs. Copyright protection was specifically allowed for drawings of mechanical designs. Allowing these drawings to be copyrighted gives manufacturers monopolies arguably stronger than patent protection (especially if the product is not patentable).

With the restriction of section 10 in the 1956 Copyright Act, Parliament once again failed (albeit again with the help of the judiciary[26]) to restrict copyright protection to non-industrial designs.

It becomes evident at this point that the British judiciary believed copyright protection was a viable means to protect copying in industry. Section 48 of the Copyright Act of 1956 facilitated construing of the law by defining "reproduction" in the following manner: "[which] in the case of an artistic work, includes a version produced by converting the work into a three-dimensional form . . . ."

So, if an industrial design does not meet the registration criteria of the Designs Act, it must then be an artistic work and as such, a three-dimensional manifestation of the two-dimensional drawing is an infringement.

As will be seen later, in some of the copyrighted design cases, man-

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[22] SKONE JAMES, 1980 at 95. See also R.F. WHALE, COPYRIGHT: EVOLUTION, THEORY AND PRACTICE (1972).

[23] SKONE JAMES, 1980 at 92.

[24] King Features Syndicate v. O. & M. Kleeman, [1941] 58 R.P.C. 207.

[25] In the Design Act of 1949, when defining a "design", the definition excluded methods or principles of construction or features of shape, or configurations which are dictated solely by the function which the article to be made in that shape or configuration has to perform.

[26] See Dorling v. Honnor Marine, [1946] R.P.C. 160.

ufacturers have greatly benefited from this law. They have been allowed to maintain monopolies in industries where they do not have any patent protection. This kind of protection would be unconstitutional in the United States.

The Design Copyright Act of 1968 appears to represent a change in philosophy by Parliament in allowing design registration to co-exist with copyright protection for 15 years from the date of the first sale of an industrial product. After that, only copyright protection continues for the statutory period.

The 1968 Act will not affect the protection of industrial designs of utilitarian objects not capable of design registration. But, since it does seem to represent a change of philosophy by the Parliament, it is worth mentioning the effect of the Act on registrable designs. Briefly, the Designs Act gives the owner of a registrable design a monopoly in his design for a limited period while a copyright protects only against copyists. In reality, however, it is the rare originator who is worried about other *independent* originators infringing his work. With the 1968 Act, any slight worry is mitigated by a monopoly for 15 years followed after that by protection only against copying. Probability dictates that a successfully marketed product has an almost zero chance of being *independently* duplicated after being on the market for 15 years. The combination of the two protections gives the originator of the design strong protection for life plus 50 years. The 1968 Designs Act appears to this author to signal an end by the Parliament of trying to restrict copyright protection only to non-industrial designs.

While mechanical designs have fallen between the crack in the coverage between copyright and design protection, the 1968 Act ends any argument that mechanical designs should have been covered by design registration. Absent further legislation, mechanical designs will continue to enjoy the benefits of United Kingdom copyright protections.

Since the early 1900's when the Imperial Copyright Conference took place, Parliament has been trying to conform British copyright to that of the U.S.[27] Perhaps because of legislative ineptness or judicial preference this desire to liken the law of the two jurisdictions has yet to be singularly effected.

Congress and the U.S. Copyright Office were quick to end any notion that copyright protection could be used to protect utilitarian industrial designs back in the 1909 Act by specifically ruling out "articles of utilitarian purpose" in the Copyright Office's 1910 Rules and Regula-

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[27] BOWKER at 34.

tions (Sections 12 and 16 previously quoted). More recent statutory law is quoted in U.S. cases examined later in this article. It is puzzling why Parliament did not enact something similar since their intent seems to have been to adopt legislation similar to the U.S. Code which provided a model. Instead Parliament chose to set up a balancing system between copyright and design registration where commercial applications of designs were supposed to be protected only by design registration whereby a limited (15 years) monopoly would be granted for industrial use of a design. By setting up this balancing system, a loophole was created which the British judiciary have surprisingly used to give patent-like protection to objects which are not patentable.

UNITED STATES COMMON LAW RE: 3-DIMENSIONAL COPYING OF 2-DIMENSIONAL EXPRESSIONS

United States copyright common law differs from that of the United Kingdom in substantially the same manner as the statutory law differs. Three-dimensional manifestations of a two-dimensional work are not considered an infringement of the two-dimensional work if it is the idea and *not* the expression which is being copied. The Supreme Court first made this evident in *Baker v. Selden,*[28] where defendant Baker made and used accounting ledgers similar to those in Selden's copyrighted book *Selden's Condensed Ledger or Bookkeeping Simplified.* The court held:

> [t]o give to the author of the book an exclusive property in the art described therein, when no examination of its novelty has ever been officially made, would be a surprise and a fraud upon the public. This is the province of letters-patent, not of copyright.
>
> ... The copyright of a work on mathematical science cannot give to the author an exclusive right to the methods of operation which he propounds, or to the diagrams which he employs to explain them, so as to prevent an engineer from using them whenever an occasion requires. The very object of publishing a book on science of the useful arts is to communicate to the world the useful knowledge which it contains. But this object would be frustrated if the knowledge could not be used without incurring the guilt of piracy of the book. And where the art it teaches cannot be used without employing the methods and diagrams used to illustrate the book, or such as are similar to them, such methods and diagrams are to be considered as necessary incidents to the art, and given therewith to the public; not given for the purpose of publication in other works explanatory of the art, but for the purpose of practical application.[29].

It becomes readily apparent from *Baker v. Selden* that the Supreme Court was going to insure that the privilege of a monopoly would not

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[28] 101 U.S. 99 (1879).

[29] Baker v. Selden, 101 U.S. 99 (1879).

be granted for anything less than the demanding procedure of qualifying for a patent.

The Supreme Court, once again, defined the distinction between copyright "protection of expression" and patent "protection of ideas" in *Mazer v. Stein*[30]. The plaintiff, a manufacturer of lamps which were made of copyrighted statuettes and lamp hardware, sued the defendant manufacturer for making lamps with a similar theme. The court held that "[u]nlike a patent, a copyright gives no exclusive right to the art disclosed; protection is given only to the expression of the idea — *not the idea* itself..." (emphasis added).[31]

The court further stated that:

> [c]opyright protects originality rather than novelty or invention — conferring only "the sole right of multiplying copies"... Absent copying there can be no infringement of copyright... Thus respondents (plaintiffs) may not exclude others from using statuettes of human figures in table lamps; they may only prevent use of copies of their statuettes as such or as incorporated in some other articles.[32]

COPYRIGHTED ARCHITECTURAL DRAWINGS

One should be careful, however, not to become confused when reading the copyrighted architectural drawing cases. A careless reading of those cases[33] leaves one with the impression that courts are holding three-dimensional structures as infringements of two-dimensional copyrighted blueprints. This is not so, and the nuance is important to notice. The courts in these cases are not restricting the defendants from reproducing an identical structure to that of the plaintiff's blueprints. They *are* holding the copyrighted blueprints infringed, however, if the defendant copies them so that he can build the structure. The court in *Imperial Homes* said:

> [w]e do not hold that the Lamonts were in anywise restricted by the existence of Imperial's copyright from reproducing a substantially identical dwelling. All we hold is that if copyrighted architectural drawings of the originator of such plans are imitated or transcribed in whole or in part, infringement occurs.[34]

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[30] 347 U.S. 201 (1954).

[31] 347 U.S. 201 (1954). See also explanation in D.S. CHISM, INTELLECTUAL PROPERTY: COPYRIGHT, PATENT AND TRADEMARK LAW, 1-35, 1-35 (1980) (hereinafter cited as Chism).

[32] 347 U.S. 201 (1954).

[33] Imperial Homes Corp. v. Lamont, 458 F.2d 895 (5th Cir. 1972), Muller v. Triborough Bridge Authority, 43 F.Supp. 298 (S.D. N.Y. 1942).

[34] 458 F.2d 895 (5th Cir. 1972).

CLOSING THOUGHTS PRIOR TO CASE STUDIES

American courts are very conservative in upholding patent monopolies.[35] The U.S. Constitution allows for limited monopolies to be granted " . . . to promote the progress of science and useful arts . . ."[36] and historically courts are strict in construing this clause. If the consideration an inventor gives for the grant of a seventeen year monopoly is the surrender, upon examination of the patent, of the invention into the public domain, what justification is there for giving copyright protection to three-dimensional copies of copyrighted two-dimensional drawings?

In a 1975 symposium on design protection, William Wallace noted that "[p]rotection is only granted when the public interest demands it — for example to foster investment of capital . . . ."[37] Is it possible that the British public is demanding this added protection and the courts have responded accordingly? Why then, is there no such demand in the United States, or have the courts not been responsive? Answers to these inquiries are suggested by a survey of the case law in the two jurisdictions.

William Wallace in the aforementioned symposium proposed that there are two types of intellectual property people: patent people and copyright people. As such:

> [c]opyright men know little about patents and do not mind. They are content to let the patent men get on with it so long as they don't interfere with copyright. Patent men, on the other hand, know a little about copyright, and of what they do know, they disapprove . . . . Normally the paths of patent men and copyright men do not cross. It is only on those rare occasions when the question of design protection is under consideration that the clash of minds occurs.[38]

This is to suggest that perhaps the current state of copyright/design protection law is a product of the clash between these two groups with the copyright people coming out on top. Wallace further suggests that:

> [e]ach contestant knows instinctively that the principles which he learned in his apprentice days and has practiced since, are the right ones . . . . It is clear to the copyright man that anything worth copying is worth protecting; that the work which his mind has created is as much his property as the work of his hand, and that anyone who takes it without his permission is simply stealing . . . .

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[35] Seventy percent of all patents that get litigated in the courts are invalidated. Lecture by Alfred B. Engelberg at the Conference on Current Developments in Patent Law, 1982. (New York City, February 19, 1982).

[36] Article 1, clause 8, section 8.

[37] Wallace, Design Protection in the United Kingdom in DESIGN PROTECTION, 40 (1976).

[38] *Id.*

> The patent man, on the other hand, says it may be all very well for these . . . copyright principles to be applied in the field of music, literature and (fine) art, but it would be quite wrong to apply them in the case of serious, down-to-earth, practical matters like mass-produced articles in every-day use.

RECENT BRITISH CASE LAW

In the previously quoted leading case of *King Features Syndicate, Inc. v. O. & M. Kleeman, Ltd.*,[39] the House of Lords, in its decision before the 1956 Copyright Act, held that the defendants infringed the plaintiff's copyright by importing and selling in the U.K. three-dimensional reproductions of two-dimensional copyrighted cartoons. The plaintiff, an American corporation, obtained protection under U.K. copyright laws when Popeye cartoons were simultaneously published in American and Canadian newspapers. Since the Popeye design was not registrable under the Designs Act, protection was available under the Copyright Code.

While this case has no apparent bearing on utilitarian industrial designs, it paved the way for industrial designs receiving long term copyright protection. Since, (1) industrial blueprints are copyrightable; (2) mechanical designs are dictated by function and thus not registrable under the Designs Act; and (3) a three-dimensional copy of a two-dimensional drawing is a copyright infringement, copying of non-patented industrial goods is a violation of U.K. copyright law. The following cases will highlight how manufacturers have capitalized on this legal bonanza.

The High Court of the Chancery held copyrighted furniture drawings infringed in *Antocks Larin Ltd. v. I. Bloohn, Ltd.*,[40] when the defendant used plaintiff's chairs as models for its chairs. Judge Graham held:

> [i]t is not, however, enough for a plaintiff to show that the defendant has made something which looks like the subject of the plaintiff's copyright, since the defendant may quite properly have arrived at the alleged infringement quite independently.... There is infringement if either the whole of the subject of copyright is reproduced or if a substantial part of such subject is reproduced, a question of fact and, in determining whether there is reproduction, the court is entitled inter alia to take into account whether the alleged infringement comes so near the original as to suggest the latter to the mind of the people seeing it. In the latter event, if it is also shown or can properly be inferred that the defendant has directly or indirectly appropriated the result of plaintiff's labours in producing the work in which he is entitled to copyright, infringement is clearly established.

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[39] [1941] 58 R.P.C. 207.

[40] [1972] R.P.C. 212.

In *Temple Instrument Ltd. v. Hollis Heels Ltd.*,[41] the defendant was manufacturing a furniture leg of which plaintiff held copyrighted drawings. In seeking a preliminary injunction, the plaintiff was required to prove: (1) that the drawing on which he relied was the subject of copyright, (2) that the drawing was an original (not copies from another drawing), (3) a substantial part of the copyrighted drawing was copied, and (4) the three-dimensional copy would appear to a non-expert to be a reproduction of the two-dimensional artistic work. Judging these matters as questions of fact, the High Court of the Chancery granted a preliminary injunction to stop the defendant from selling the furniture legs.

In *L.B. (Plastics) Ltd. v. Swish Products Ltd.*,[42] the House of Lords allowed an appeal and held that the defendant infringed plaintiff's copyright of plastic furniture drawers. The facts of the case highlight some important concepts and therefore will be summarized.

The plaintiff was a successful manufacturer of knock-down plastic furniture drawers and enjoyed a substantial portion of the business. Defendant, a subsidiary of a furniture company which purchased knock-down drawers from the plaintiff, sought to design a similar model which could be used by their parent company. However, it was necessary for defendant's drawer to be interchangeable with the plaintiff's so that the parent company could simultaneously use both type drawers. Aware of possible patent and registered design infringement problems, defendant sought the help of patent counsel to design around the plaintiff's designs.

The trial court held that copyrighted drawings of the knock-down drawer were infringed. The appeals court reversed the lower court's decision, holding that defendants merely appropriated the design "idea" which is not protected by copyright. The House of Lords vacated the appellate court decision and restored the decision of the trial court. Judge Whitford, in the trial court decision, responded to the defendant's defenses that: the drawings weren't copyrightable subject matter, weren't original, and giving copyright protection to industrial products is absurd, by holding:

> [c]opyright in the literary, artistic or indeed any other field is concerned to stop one man's skill and labour being taken by another for profitable exploitation, and I can see no reason why under the Act the engineering draughtsman should be excluded from the protection given to architectural draughtsman, to painters of genius or to mere daubers.[43]

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[41] [1973] R.P.C. 15.

[42] [1979] R.P.C. 549.

[43] *Id.* at 566.

> If in relation to any work; be it literary, dramatic, musical or artistic, the question being asked is, "is this an original work", the answer must depend on whether sufficient skill or labour or talent has gone into it to merit protection under the Act. It is always a question of degree.[44]
>
> Next it is said to be absurd that in the industrial field, by making a drawing, a man should get protection extending for his life plus fifty years, whereas under a registered design or patent he can only get fifteen or sixteen years. This, however, totally overlooks the fact that designs and patents give a monopoly effective against persons whose work owes nothing to the work of the design proprietor or the patentee. In these cases there is a true monopoly. From start to finish copyright never stops anyone working on the same lines, upon the same sort of basic idea, and copyright cannot be effective against anyone who produces something independently. It is only effective to stop third parties from helping themselves to too liberal a portion of another man's skill and labour for their own exploitation.[45]

It is interesting to note that in 1974 The United States Congress created the National Commission on New Technological Uses of Copyrighted Works (CONTU) to investigate, among other problems, protection of computer programs. The Commission recommended the use of copyright and proposed legislative changes which were embodied into the Computer Software Copyright Act of 1980. The rationale of the Commission is similar to that of Judge Whitford in the aforementioned quote on the effectiveness of copyright.[46]

In discussing whether the defendant merely used the plaintiff's idea or copied the expression, the House of Lords, in *L.B. (Plastics), Ltd.*, held:

> [t]here can be no copyright in a mere idea, so if all the respondents had done was to take from appellants the idea of external latching, or the unhanding of components, or any other idea and put it in their work, the appellants could not complain. Nor is there infringement if a person arrives by independent work at a substantially similar result to that sought to be protected. The protection given by the law of copyright is against copying, the basis of the protection being that one man must not be permitted to appropriate the result of another's labour. That copying has taken place is for the plaintiff to establish and prove as a matter of fact.[47]
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> The adoption of these modifications (by respondents from appellants) does not negate the antecedent copying, nor reduce the extent of the reproduction to anything less than substantial. Substantial being a question of quality rather than quantity, there is no doubt, in the judge's (trial Judge Whitford) words, that the respondents "copied many of those things which give it its specific individuality."[48]

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[44] *Id.* at 568.

[45] *Id.* at 570.

[46] Bender, Licensing Computer Software in CURRENT DEVELOPMENTS IN PATENT LAW 1982, 427 (1982).

[47] [1979] R.P.C. 549 at 619.

[48] *Id.* at 622.

Both judges were effectively able to differentiate between the idea and expression, although far more liberally than American judges. This is the key area where U.K. copyright diverges from U.S. copyright. Under the *Baker v. Selden*[49] rationale (where use of the idea cannot constitute copyright infringement if it is possible to separate the *idea* from the *expression*[50]), this case would not have held the copyrighted drawings infringed. The appellate judge (Lord Justice Buckley) in *L.B. (Plastics)* maintained this view in his holding which was reversed.

The copyright protection of "ideas" is given life by section 49 of the U.K. Copyright Act which defines reproduction as including a reproduction or copy of a *substantial* part of an artistic work. "Substantial" allows a copy to include modifications which might significantly alter the efficiency and function of the part but still be an infringement if the part appeared to a *non-expert* to be a reproduction of the copyrighted artistic work[51]. This situation is evident in *Nichols Advanced Vehicle Systems, Inc. v. Rees, Oliver, et al*[52].

In *Nichols,* plaintiff's company, incorporated in the United States with its principal place of business in the United Kingdom, was involved in the business of designing, building and racing Formula 1 cars. After completion of 70% of a design for a new car, plaintiff's chief engineer and designer, personal assistant, and production manager left plaintiff's employment and started their own company in the same business. In order to rapidly build a competitive car for the circuit and thereby gain a competitive advantage to compete for sponsors, plaintiff's ex-employees (hereinafter defendants) used the plaintiff's drawings of its new car to make parts for their car. Since defendant's chief engineer and designer was the originator of the plaintiff's drawings, some of these drawings were modified and improved as the designing of the car was completed. When the defendant's car was completed two months prior to plaintiff's, plaintiff brought suit for copyright infringement. The court held that 170 drawings (40% of those used to build the car) were copied from the plaintiff. These included many of the drawings modified by the defendant. They were held to be infringed as long as the three-dimensional part appeared to a non-expert (in this case, the judge) to be a substantial copy of the copyrighted drawing.

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[49] 101 U.S. 99 (1879).

[50] *Id.*

[51] Section 9(b) of the U.K. Copyright Act of 1956.

[52] [1979] R.P.C. 127.

Defendants were required to return all copied drawings and parts reproduced from such drawings including those used on their race car. The case was remanded to a trial judge for inquiry into other damages incurred by the plaintiff.

In the Judge's response to the defendants' pleading of laches, the Judge highlighted the difference between U.S. and U.K. copyright protection of industrial designs. Plaintiff, an American citizen and resident, first realized on January 25, that the defendant copied his designs. The plaintiff complained to police and had defendant's factory searched in hopes of finding tools, drawings or the like which might have been stolen from his factory. It was not until almost two and a half months later, on April 10, that the plaintiff filed a copyright infringement complaint. The Judge excused this long length of time stating that the plaintiff was an American and not knowledgeable that his remedy for this action in the U.K. was to file a complaint claiming copyright infringement.

In *Merchant-Adventures Ltd. v. M. Grew & Co. Ltd.*,[53] the court granted a preliminary injunction restraining the defendant from importing light fixtures from Germany which infringed plaintiff's copyrighted drawings. There were minor differences between the products of both parties but defendant's fittings showed a marked similarity to those of the plaintiff's. Judge Graham held that:

> [t]here is infringement of drawings by three-dimensional reproduction of those drawings if they are sufficiently clear for a man of reasonable and average intelligence to be able to understand them and from an inspection of them be able to visualize in his mind what a three-dimensional object made from them would look like and if the alleged infringement looks to him to have been made from such drawings.[54]

Unless the defendant is openly importing, selling or manufacturing an infringing product, it is often difficult for a plaintiff to prove copyright infringement. In *Anton Piller KG v. Manufacturing Processes Ltd.*,[55] the Court of Appeals affirmed a lower court's jurisdiction to make an *ex parte* order requiring defendant to permit the plaintiffs to enter defendant's premises so that the plaintiffs could inspect, remove or make copies of any documents belonging to them. The court held, however, that this power should be used "only in the extreme case where there was grave danger of property being smuggled away or of vital evidence being destroyed".[56]

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[53] [1972] 1Ch. 242.

[54] *Id.* at 255.

[55] [1976] 1 All ER 779.

[56] *Id.* at 780.

Such an order, now commonly referred to as an "Anton Piller Order", is a powerful tool to enforce copyright rights.

Anton Piller Orders were used in the recent case of *Politechnika Ipari Szovetkezey & Others v. Dallas Print Transfers Ltd.*,[57] where the defendants were accused of copyright infringement of plaintiff's drawings of the Rubic's Cube. Interlocutory injunctions were granted restraining defendants from selling, offering for sale, or by way of trade, distributing without a license, the plaintiff's cube-sized puzzles, or otherwise infringing the copyrights of the parts or packaging of the puzzles. Anton Piller Orders were used to search the premises of the four defendants.

In *Prismo Universal, Ltd. v. Guidelines (Developments), Ltd.*,[58] the Court of Appeals dismissed the appeal and affirmed the trial court's interlocutory injunction against the defendant who allegedly infringed plaintiff's design of a reflective road stud. Both parties were involved in the business of selling reflective road studs. Plaintiff's design had been accepted by the Saudi Arabian Government for use on a new highway. Defendant, with the help of insiders in Saudi Arabia, was shown plaintiff's copyrighted road stud, copied it and submitted it for approval to the Saudi Government. Defendant received a contract from the highway construction firm for the infringing road studs.

The court, in affirming the injunction, balanced the potential harm which would be experienced by both parties if it was found, after a full trial on the merits, that the temporary injunction was wrongly granted. The court reasoned that the plaintiff had assets large enough to compensate for any possible damages but could be severely damaged if the injunction was not affirmed.[59]

In closing this section on U.K. case law, it is worth mentioning the strange twist thrown into the protection of industrial designs by *Catnic Components, Ltd. v. Hill & Smith, Ltd.*[60] wherein Judge Whitford held that:

> [b]y applying for a patent and accepting the statutory obligation to describe and if necessary illustrate embodiments of his invention, a patentee necessarily makes an election *(between copyright and patent protection)* accepting that, in return for a potential monopoly, upon publication, the material

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[57] [1981] Unreported: Martin Meredith 1288.

[58] [1981] Unreported: Association 2583.

[59] See also Abacus Municipal Ltd. v. BSW Bus Shelters (Wales) Ltd., [1981] A.No. 2405 Unreported: Martin Meredith 30 July 1981, and Jarogate, Ltd. v. Cleartone Electronics, Ltd., Chancery Division [1981] J.No. 819 Unreported: Martin Meredith 10 March 1981 for similar copyright injunction cases.

[60] [1978] Fleet St. Rpts. 405.

> disclosed by him in the specification must be deemed to be open to be used by the public, subject only to such monopoly rights as he may acquire on his application for the patent and during the period for which his monopoly remains in force, whatever be the reason for the determination of monopoly rights . . .[61]

RECENT AMERICAN CASE LAW

SCOA Industries, Inc. v. Famolare, Inc.,[62] was an action by the plaintiff for declaratory and injunctive relief regarding defendant's alleged patent, trademark and copyright rights. Famolare, originator of waved bottomed shoes, counterclaimed for copyright infringement.

Famolare was only able to obtain a limited copyright registration covering an ornamental bicycle design molded into the bottom of their unique shoe sole. In rejecting registration of Famolare's molded shoe sole design, the Copyright Office stated that "registration was refused because the molded bottom contains no elements capable of independent existence apart from the utilitarian aspect."[63]

In refusing to enjoin the plaintiff's use of the wavy bottom shoe sole (which did not incorporate defendant's ornamental bicycle design), the district court explained that Famolare's copyright cannot extend to the shoe sole despite claims under 17 U.S.C. §5(g) that it is a work of art. This was explained citing §202.10 of 37 C.F.R. (1975):

> (c) If the sole intrinsic function of an article is its utility, the fact that the article is unique and attractively shaped will not qualify it as a work of art. However, if the shape of a utilitarian article incorporate features, such as artistic sculpture, carving, or pictorial representation, which can be identified separately and are capable of existing independently as a work of art, such features will be eligible for registration.[64]

The court concluded that a shoe sole is an object whose intrinsic function is utilitarian.

Section 202.10(c) of 37 C.F.R. was disputed in an action involving Esquire, Inc. and Barbara Ringer, the Register of Copyrights.[65] The plaintiff, Esquire, claimed that it should be able to copyright artistic lighting fixtures, eligible as a "work of art" under 17 U.S.C. §5(g). Citing 37 C.F.R. §202.10(c), the Register of Copyrights claimed that all the elements of the light fixture directly related to the useful functions of the fixture and contained no elements which were capable of inde-

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[61] *Id.* at 427.

[62] 192 USPQ 216 (S.D. N.Y. 1976).

[63] *Id.* at 218.

[64] *Id.*

[65] Esquire, Inc. v. Ringer 591 F.2d 796 (D.C. Cir. 1978), cert. den. 440 U.S. 908, 99 S.Ct. 1217, 59 L.Ed.2d 456 (1979).

pendent existence as a copyrighted work (for example, a sculpture or a picture).

In the appeal from the district court decision directing the Register to issue a Certificate of Copyright, the Court of Appeals for the District of Columbia held that the Register had adopted a reasonable and well supported interpretation of §202.10(c) in her rejection of the application. In support of this holding, the court stated that:

> [t]he Register's interpretation of §202.10(c) derives from the principle that industrial designs are not eligible for copyright. Congress has repeatedly rejected proposed legislation that would make copyright protection available for consumer or industrial products. (footnote 12: Since 1914, approximately seventy design protection bills have been introduced in Congress, none of which has been enacted into law . . .) Most recently, Congress deleted a proposed section from the Copyright Act of 1976 that would have created a new limited form of copyright protection for "original" designs which are clearly a part of a useful article, regardless of whether such designs could stand by themselves, separate from the article itself. In rejecting proposed Title II, Congress noted the administration's concern to make such designs eligible for copyright would be to create a "new monopoly" having obvious and significant anti-competition effects.[66] (footnote 15: The register's brief illustrates the problems involved in allowing copyright of the shape of utilitarian articles.
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> There are several economic considerations that Congress must weigh before deciding whether, for utilitarian articles, shape alone, no matter how aesthetically pleasing, is enough to warrant copyright protection. First, in the case of some utilitarian objects, like scissors or paper clips, shape is mandated by function. *If one manufacturer were given the copyright of the design of such an article, it could completely prevent others from producing the same article.* Second, consumer preference sometimes demands uniformity of shape for certain utilitarian articles, like stoves for instance. People simply expect and desire certain everyday useful articles to look the same particular way. Thus, to give one manufacturer the monopoly on such a shape would also be anti-competitive [sic]. Third, insofar as geometric shapes are concerned, there are only a limited amount of basic shapes, such as circles, squares, rectangles and ellipses. These shapes are obviously in the public domain and accordingly it would be unfair to grant a monopoly on the use of any particular such shape, no matter how aesthetically well it was integrated into a utilitarian article.) (Emphasis added.)[67]

In an effort to rule consistently with legislative intent, the Court of Appeals for the District of Columbia cited a U.S. House of Representative Report[68] which:

> [i]ndicates that the Section of the 1976 Act governing "pictorial, graphic and sculptural works" was intended "to draw as clear a line as possible between copyrightable works of applied art and uncopyrighted works of industrial design." The report illustrates the distinction in the following terms:

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[66] 591 F.2d 796 at 800-1.

[67] 591 F.2d 796 at 800, n.15.

[68] House Report No. 1476, 94th Congress, 2d Sess. 55 (1976) U.S. Code Cong. & Admin. News 1976 at 5668.

> ... although the shape of an industrial product may be aesthetically satisfying and valuable, the Committee's intention is not to offer it copyright protection under the bill. Unless the shape of an automobile, airplane, ladies' dress, food processor, television set, or any other industrial product contains some element that, physically or conceptually, can be identified as separable from the utilitarian aspects of that article, the design would not be copyrighted under the bill. The test of separability and independence from "the utilitarian aspects of the article" does not depend upon the nature of the design — that is, *even if the appearance of an article is determined by aesthetic (as opposed to functional) considerations, only elements, if any, which can be identified separately from the useful article as such are copyrightable.* And even if the three dimensional design contains some such element (for example, a carving on the back of a chair or a floral relief design on silver flatware), *copyright protection would extend only to that element, and would not cover the over-all configuration of the utilitarian article as such.* (Emphasis added by court.)[69]

Thus, the Court of Appeals for the District of Columbia reversed the district court holding in favor of Esquire and provided a much cited guideline for the copyrightability of utilitarian works of art.

The Court of Appeals for the Second Circuit decided two cases in 1980 which sent confusing signals to the lower courts and the Register of Copyrights.

The first, *Durham Industries, Inc. v. Tomy Corp.*,[70] was an action by one toy manufacturer against another for infringement of three-dimensional Disney character toys and infringement of other miscellaneous games. Since counterclaimant Tomy added nothing unique to its three-dimensional figures which were licensed from copyright holder, Walt Disney Production, the figures themselves were not eligible for copyright.

Tomy's copyright was not disputed on the miscellaneous games Durham was charged with copying. However, the court held that Durham did not copy the expression, which Tomy had protected, but that Durham copied the idea, for which Tomy had no protection. The court stated that "[i]t is an axiom of copyright law that the protection granted to copyrightable work extends only to the particular expression of an idea and never to the idea itself."[71]

Quoting *Mazer v. Stein*,[72] the Court of Appeals for the Second Circuit held that another copyright limitation "must be kept in mind in assessing substantial similarity. Just as copyright protection extends to

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[69] 591 F.2d 796 at 803.

[70] 630 F.2d 905 (2nd Cir. 1980).

[71] *Id.* at 912.

[72] 347 U.S. 201 (1954).

expresion but not ideas, copyright protection extends only to the artistic aspects, but not the mechanical or utilitarian features of a protected work."[73]

In *Kieselstein-Cord v. Accessories By Pearl, Inc.*,[74] the Court of Appeals for the Second Circuit reversed the district court's grant of summary judgment for the defendant and remanded the case for consideration of whether the plaintiff had satisfied the copyright notice requirements.

Plaintiff, Kieselstein-Cord, designed and manufactured expensive belt buckles made from precious metals. The designs of the two buckles in question were registered with the Copyright Office. The plaintiff manufactured and sold thousands of their belt buckles and received awards on the designs.

The defendant copied the plaintiff's design and manufactured them using common metals. When charged with copyright infringement, defendant-appellee argued that the belt buckles are not copyrightable since "they are useful articles with no pictorial, graphic, or sculptural features that can be identified separately from, and are capable of existing independently of, the utilitarian aspects of the buckles."[75]

The Court of Appeals for the Second Circuit held that it was possible to separate the ornamental aspect from the utilitarian aspect of the buckle and hence the design is capable of copyright registration. As admitted by Circuit Judge Oakes; "[t]his case is on a razor's edge of copyright law."[76]

However, this decision is apt to send confusing signals to the Copyright Office and to lower courts, especially since it requires a determination to be made by the Register or trier of fact as to what is "art", a decision which was not required prior to this case.

The dissent in *Kieselstein-Cord*[77] recognizes the apparent inequities of the law and in doing so highlights the fairness of U.K. Copyright Law. Judge Weinstein stated in his dissent that:

> [t]he works sued on are, while admirable aesthetically pleasing examples of modern design, indubitably belt buckles and nothing else; their innovations of form are separable from the important function they serve — helping to keep the tops of trousers at waist level.

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[73] 630 F.2d 905 at 913.

[74] 632 F.2d 989 (2nd Cir. 1980).

[75] *Id.* at 991.

[76] *Id.* at 990.

[77] See also Judge Clark's dissent in Ideal Toy Corporation v. Sayco Doll Corporation, 301 F.2d 623 at 625 (2nd Cir. 1962).

> The conclusion that affirmance is reached reluctantly. This result does deny protection to designers who use modern three-dimensional abstract works artfully incorporated into a functional object as an inseparable aspect of the article while granting it to those who attach their independent representational art, or even their trite gimmickry, to a useful object for purposes of enhancement. Moreover, this result enables the commercial pirates of the marketplace to appropriate for their own profit, without any cost to themselves, the works of talented designers who enrich our lives with their intuition and skill. The crass are rewarded, the artist who creates beauty is not. All of us are offended by the flagrant copying of another's work. This is regrettable, but it is not for this court to twist the law in order to achieve a result Congress has denied.[78]

CONCLUSION

Even a cursory glance of common and statutory copyright law covering designs for utilitarian devices highlights the opposing viewpoints of the U.S. and U.K. The basis for this difference is, however, not apparent. The United Kingdom seems to think it is important to guard against copying, even if this results in creating monopolies that would not meet the statutory requirements for patentability. On the other hand, the United States is extremely cautious in granting monopolies even if not doing so results in an injustice.[79]

Certainly, a country's economic growth can be affected somewhat by the legality of copying. If, as one Judge has commented, "[e]xperience suggests that free copying results in more rapid development",[80] it would be interesting to examine the economies of the U.S. and the U.K. in light of this maxim.

Although "copyright monopolies" in the United Kingdom would presently be considered unconstitutional if granted in the United States, it is interesting to note that the scope of U.S. copyright is being expanded to cover computer software.[81] Time will tell whether U.S. copyright will be further expanded, along the lines of U.K. copyright, to stop existing injustices in the marketplace. But for now U.K. copyright can be very beneficial to American Industry[82] and it would be advantageous for American patent attorneys to be familiar with it.

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[78] 632 F.2d 989 at 994.

[79] See Judge Weinstein's dissent in Kieselstein-Cord v. Accessories By Pearl Inc., 632 F.2d 989 at 994 (2nd Cir. 1980).

[80] *Id.* at 999.

[81] Note, 46, *supra.*

[82] See, for instance, King Features Syndicate v. O. & M. Kleeman, Ltd., [1941] A.C. 417.

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COMPILED BY JUDITH GIRE NORCROSS*

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COMMENTARY

The U.S.A. National Phase of Foreign PCT Filings

Whether or not there is any real justification, a tendency seems to exist for additional impediments in the U.S.A. prosecution phase of applications for Letters Patent initially filed abroad through the Patent Cooperation Treaty (PCT). This can materially increase what many already regard as onerous practices in "chemical" cases. An example in point is found in the prosecution history of a recent patent application in the United States Patent and Trademark Office (PTO). Cf. file history of United States Patent No. 4,395,414.

In addition to issues relating to claims to compounds and to pharmaceutical compositions, questions arose concerning possible special requirements for perfecting priority rights and the prejudicial effect of taking extra care to satisfy United States requirements in naming the inventors even when such naming results in a different entity from that named for another country (however, hereinafter the inventive entity is called Eistetter, et al. in both the U.S. application and the earlier European application). We may wonder how often such issues must be raised and what is required to overcome the issues in prosecuting an application. Do Examiners raise the same issues repeatedly (just to see how applicants will respond) even when they should know that the issues are unwarranted?

An application (PCT/EP 80/00086) was filed under the Patent Cooperation Treaty on August 29, 1980, claiming priority rights based on a Swiss application of August 30, 1979, and on a European application of August 14, 1980. The PCT "Notification Concerning Submission of Priority Document" bearing a mailing date of October 15, 1980, confirmed that certified copies of the priority documents had been received by the International Bureau on October 13, 1980. Yet, the first Office Action (Paper No. 2) issued by the PTO in the prosecution of the U.S.A. phase indicated that the certified copies had not been received. In addition, product claims were rejected under the second paragraph of 35 U.S.C. 112:

> ... as failing to clearly claim the subject matter in regard to the recitation of "salts thereof with inorganic and organic bases" in that it is not possible to determine from such language what salts are pharmaceutically acceptable, and thus, the claims are indefinite. Furthermore, claims 9-11 fail to recite the type of pharmaceutical composition, and thus, one cannot determine how they are to be used if it is not known what condition is being

> treated, since there are a multitude of compositions and formulations for treatment of different conditions. "Medicaments" is objected to in claim 9 since it is vague; also the effective amount of the compound is not specified.

This ground of rejection suggests that defining metes and bounds in a claim in a manner which would permit an artisan to determine whether a particular embodiment in question falls within or without its scope may not be enough if the proverbial man of ordinary skill in the art cannot also readily determine from the claim all possible embodiments. There is more than a suggestion that a prospective use is an essential part of an allowable composition claim and that inclusion within the scope of such claim of an embodiment which "may" not be acceptable for applicant's purposes would prejudice the patentability or validity of such claim.

In pertinent part, the response to this Office Action reads as follows:

> The Office Action states (page 1) that certified copies of the Convention documents have not been received. Please find herewith a copy of a paper issued by the PCT confirming receipt by the International Bureau of the required documents. Kindly confirm that all requirements for perfecting Applicants' claim of priority have been satisfied. [This entire issue should not have been raised.]
>
> The rejection of claims 1 to 4 and 9 to 11 "under 35 USC 112, second paragraph" is respectfully traversed. The nature and type of salts which are pharmaceutically acceptable are well recognized by any artisan and have been for a substantial period of time prior to the filing of this application. That which is well known need not be spelled out in claims or even in an application. No one of ordinary skill in the art would find the indefiniteness alluded to.
>
> With regard to the claims, the specification points out that all of the compounds are useful; "Salts which are not pharmacologically acceptable are converted, by methods which are known per se, into pharmacologically acceptable salts . . . " (page 3, lines 8 to 10). Claims 1 through 4 are directed to compounds, all of which are useful.
>
> Issue is respectfully taken with the criticism of claims 9 to 11. No requirement is known for claims directed to compositions to recite any use for such compositions. Method-of-use claims are available for claiming use of such compositions. Newly-presented claim 13 recites a use and defines the amount of active ingredient in a manner based on such use. Current practice does not require the recitation of use in composition claims, and this is readily substantiated by reviewing virtually any issue of the *Official Gazette* . . . Composition claims 10 and 11 define the subject matter to which they are directed with requisite particularity; they also define that which Applicants regard as their invention. Certainly, the Applicants are the best judges of what they regard as their invention. Applicants wish to direct a patent to the attention of the PTO. This patent (USP 4,006,148) issued on February 1, 1977, to Wehrmeister. It concerns compounds which are somewhat structurally related to those of Applicants' claims. A copy of this patent is submitted herewith for the Examiner's convenience.

In response, the PTO cited and relied upon (Paper No. 5) the patent (reference C) directed to the Examiner's attention, Applicants' own published European Patent Application (reference L) and a published

abstract (reference T) of the Applicant's European application:

> Claims 1-4, 10-11 and 13-14 are rejected under 35 U.S.C. 102(a) as clearly anticipated by Eistetter, et al. (L), newly cited because the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country before the invention thereof by the applicant for patent.
>
> Applicants' claim for priority based on European 80140800.0 and Switzerland 788/79-6 is noted; however, it is noted that no certified copies or translations have been filed as required by 37 CFR 1.55(b), as required to overcome the rejection.
>
> It is noted that Eistetter, et al. (L) is based on the same Swiss application applicants of which claim priority. However, as indicated by the Chemical Abstracts abstract (T) of The Eistetter, et al. European Patent Application (L), cited for applicants convenience, the inventive entity is not the same as that of the U.S. application. If the inventorship of the foreign applications of which applicants claim priority are not the same, priority cannot be granted. See MPEP 201.15.
>
> Applicants' claim for benefit based on the International Application PCT/EP80/00086 is also noted, as well as the fact that the copies have been received by the International Bureau. Since 35 USC 365 states that a certified copy and a translation, if the application is not filed in the English language, may be required, and since examination of said copy is necessary to determine if the subject matter finds support in the application a certified copy with a translation, (if) it [is] was filed in another language, is required. However, since 35 USC 365 states that such benefit must be in accordance with 35 USC 120, if the inventorship of the International Application is not the same, benefit may not be accorded. Applicants, therefore, are required to set forth the inventorship of such foreign applications of which they claim benefit or priority, since the question of the inventorship has arisen.
>
> Claims 1-4 and 10-11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as his or her invention.
>
> The claims are indefinite in the recitation of organic and inorganic bases, since the term includes all bases and it cannot be determined out of the myriads possible which are included, and certainly, not all are suitable. Also, claims 10-11 are vague and indefinite in the lack of recitation of the pharmaceutical use.
>
> Applicant(s) arguments filed June 18, 1982 have been fully considered but they are not deemed to be persuasive.
>
> In regard to the rejection under 35 USC 102(a), the remarks do not apply, since this is a new ground of rejection. As regards the rejection under 35 USC 112, second paragraph, although the disclosure recited that the non-pharmacological salts may be converted into those that are acceptable, this still does not overcome the rejection, since it does not state what other salts may be converted. There are many possible salts, some of which may be useful for conversion, but others that will not be useful for various reasons, such as failure to form a salt that can readily be converted, formation of a toxic salt with a base that is impossible to remove from the reaction mixture, etc. Furthermore, not all bases will form salts. Nor is the term precise, since base can include types of compounds, such as Lewis bases that may not readily form salts with the acid. In regard to the pharmacological use, it is noted that the claim ought to define the composition in terms of how it is to be used, since the mere recitation of a pharmaceutical composition will give no idea of how the composition is to be used.

> Claims 1-4, 10-11 and 13-14 are rejected under 35 U.S.C. 103 as being unpatentable over Wehrmeister, newly cited by applicants. Although the invention is not identically disclosed or described as set forth in section 102 of Title 35 U.S.C., the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.
>
> Wehrmeister teaches structurally related compounds having a pharmacological utility, over which applicants' compounds and compositions are considered obvious to one skilled in the art in view of the structural relationship and in the absence of unexpected results. *In re Henze,* 85 USPQ 261 [181 F.2d 196 (C.C.P.A. 1950)], *In re Payne, et al.,* 203 USPQ 245 [606 F.2d 303 (C.C.P.A. 1979)].

The issues were proliferating rather than being resolved. In view of the acknowledged relationship between the application relied upon as prior art and the application being prosecuted before the PTO, there should have been some way for the Applicants to avoid facing these issues in the U.S.A. National Phase. They had taken required precautions and had gone out of their way to satisfy U.S.A. requirements. They had established a record before the PCT. Should this not have been enough?

Perhaps a copy of all PCT papers should be forwarded to each designated state and made part of the National-Phase prosecution so that previously-resolved issues can be avoided. This could save considerable prosecution time and expense for both the PTO and Applicants.

Instead, each issue was again considered in a request for reconsideration:

> The rejection of claims 1 to 4, 10, 11, 13 and 14 "under 35 U.S.C. 102(a) as clearly anticipated by Eistetter, et al." is respectfully traversed. Since Eistetter et al (L) was published on March 11, 1981, that is its effective date as a reference. Since Applicants' PCT application (on which the subject application is based) was filed on August 29, 1980, it is unquestionably entitled to the last-noted date, even without consideration of the prior Swiss Convention application acknowledged in Applicants' Declaration. The PCT application was filed in English and has a text which is identical to that forwarded to the PTO by the International Authority for examination. The published European application (which is the EPO counterpart of this application) is thus not an effective reference for any purpose.
>
> This rejection is made under 35 U.S.C. 102(a); should such a ground of rejection be retained, Applicants respectfully request that the specific language of the statute be directly applied to the prevailing facts so that Applicants may understand the basis of this rejection, which is not clear from Paper No. 5.
>
> With regard to Applicants' claim of priority based upon the applications identified in their Declaration, the filing of the required certified copies is confirmed by a paper (copy herewith) issued on October 15, 1980, by the PCT. Since the filing date of the Swiss application is not required to overcome the art-based ground of rejection, no certified translation of the Swiss Convention document is required at this time, and no useful purpose would be served by forcing Applicants to prepare a sworn English translation of that document.

As is well recognized, criteria for inventorship are quite different in the United States from those generally applied in other countries. When Applicants filed their PCT application, a concerted effort was made to comply fully with United States requirements in the identification of Applicants for this country. It was for that reason that, for the same application, only some of the inventors named for other countries were selected as those who qualify under U.S.A. criteria. Please note the accompanying copy of Form PCT/RO/101. The accompanying copy of Form PCT/RO/132 reveals that the different inventorship was questioned in a paper mailed on October 2, 1980, and an invitation was made with respect to this question. Applicants explained to the Authorized (PCT) Officer who issued the Notification and this Invitation as to the reason for distinguishing between the United States and other countries with regard to the named inventors. Such Authorized Officer accepted the provided arguments and withdrew the Invitation; he agreed that the first two paragraphs of the Notification could be disregarded, as confirmed by the accompanying copy of Form PCT/RO/132 of October 13, 1980.

As in Germany and in most countries outside of the United States the question of inventorship is solved in a different way, and the validity of a patent in such other countries has nothing to do with the naming of inventors; the inventive entity in countries outside of the United States can thus differ from that named according to United States law. In this connection it is noteworthy that the PCT application form provides a box X which takes into account the problem of different inventors for different states.

The PCT application, the EPO application (L) and the instant application all have exactly the same inventorship; only the naming of inventors in the several applications differs. The naming of inventors for the United States application was separately determined to satisfy United States criteria.

The Examiner acknowledges the fact that copies of the Convention applications have been received by the International Bureau; such is all that is required to perfect Applicants' Convention rights. As the EPO and PCT applications are in English, nothing further should be required.

Reference L is Applicants' own European Application for which priority rights are claimed in Applicants' Declaration. The cited publication date is March 11, 1981. Applicants' International filing date is August 29, 1980. Reference L is thus not prior art.

The rejection of claims 1 to 4, 10 and 11 "under 35 U.S.C. 112, second paragraph, as being indefinite" is also respectfully traversed. There is nothing whatsoever indefinite about "organic and inorganic bases". It appears that there may be some confusion between breadth and definiteness. The statute does not preclude breadth. When a term includes all bases, there is no need to make any determination which are included; all bases are included. The allegation that "not all are suitable" is completely conjectural.

Compositions which recite proportions of ingredients do not require a recitation of pharmaceutical use; moreover, such recitation is not a limitation in composition claims.

Issue is respectfully taken with the discussion presented in the second paragraph on page 4 of Paper No. 5. Virtually all salts can be converted. There is no reason to believe that any salt will not be useful in a manner fully supported by Applicants' disclosure. The fact that it may not "readily" be converted does not preclude its utility in a patent sense. Reference to "formation of a toxic salt with a base that is impossible to remove from the reaction mixture" is an entirely unsupported allegation. The assertion that "not all bases will form salts" does not appear to have any relevance; all that is being claimed are the salts. If a salt is not formed, it is not claimed.

Use claims are designed to cover pharmacological uses; composition

> claims are designed to protect compositions. There is no more need to include the use in a composition claim than there is in any other product claim.
>
> The rejection of claims 1 to 4, 10, 11, 13 and 14 "under 35 U.S.C. 103 as being unpatentable over Wehrmeister" is also respectfully traversed. Nothing is found in that reference that could possibly lead any artisan to instantly-claimed subject matter. There is no reason to believe that the hydrogen atom attached to Wehrmeister's ring nitrogen is equivalent to —A—COOH, similarly situated in the structures of Applicants' claimed compounds. In addition Wehrmeister's compounds are useful for treating coccidiosis, a disease of poultry caused by parasites, whereas Applicant's compounds increase glucose synthesis in the liver, which makes them convenient for treating hypoglycemic states in mammals. The remoteness of the art is confirmed by the PCT search report (Form PCT/ISA/210) issued on December 3, 1980. That search report classifies the same reference as merely a document defining the general state of the art, which is all it is.

Although this request for reconsideration resulted in the issuance of a formal Notice of Allowance, there should have been some way to avoid a second Office Action and the required response without detriment to U.S.A. practice or to the validity of issued patents. Whatever is stated in the request for reconsideration should have been available to or known by the PTO. The time it took to prepare and review the second Office Action would have been better spent on determining that such action would serve no useful purpose. This would have avoided the processing of the Office Action, Applicants' consideration and response and the PTO's processing and evaluation of the response. Although there are advantages to having issues fully aired during prosecution, there must be a reasonable "cost" balance, and the PTO should face its responsibility to reduce or eliminate each and every issue as soon as possible. This could even lead to a significant reduction in the cost of PTO operations.

QUESTIONS

1. Must the proverbial man of ordinary skill in the art be able to determine from a claim all possible encompassed embodiments or is it sufficient for him to discern whether a particular embodiment in question falls within or without the scope of the claim?
2. Does a composition claim which defines amounts of essential components have to specify a particular use for the composition?
3. Are there special requirements for perfecting priority rights in the U.S.A. national phase of a PCT application?
4. Does the naming of different inventors in the U.S.A. phase of a PCT application prejudice available protection or Convention rights?
5. Is there an onus on applicants to exclude from claims embodiments that may not have a contemplated utility?

6. To preclude patentability, must applied art present a prima facie case of obviousness or is it enough for an Examiner merely to allege such obviousness?

Berman, Aisenberg & Platt
Washington, D.C.

ACADEMIC RESPONSIBILITIES AND DEPENDENCIES*

BY STEVEN MULLER**

Good morning ladies and gentlemen. Thank you very much Tom (i.e., Thomas I. O'Brien, Chief Patent Counsel, Union Carbide Corporation) for that generous and, unfortunately, even accurate, in part, introduction.

I am not a lawyer, and I am not a scientist. What I would like to do for a few minutes is to remind us with what kind of backgrounds people from universities come to the question of enlarging relationships, particularly with for-profit industrial ventures. Let me confirm what is implicit in what Mr. Carlson (Curtis W. Carlson, Moderator and member, New York Bar) said, and that is that I very much believe that it is in the public interest, in the interest of the corporation, and in the interest of the university community to strengthen ties between universities and for-profit corporations. Although I am critical of some of the efforts that are being discussed to do that, and sometimes think we do not have the accent on the right syllable, what concerns me most is that we are taking a lot for granted in talking about the modern-research university which is worth examining. So if you will bear with me for a few minutes I am going to try and do a little historical detour and begin by saying that this notion that the university is in the research business, is not exactly all that hallowed: that it is in fact fairly recent; and that we are still adapting to it.

The modern research university, as we know it, has precursors that go back certainly into the Nineteenth Century, and some would argue to the Eighteenth Century in Scotland, but it does not have its origins except as the institution had its origins in traditions that go back much before that. And, the seminal aspect of it probably was the work of a

*Paper delivered before The Association of the Bar of the City of New York, April 21, 1982.

**President, The Johns Hopkins University.

German named von Humboldt with respect to a reform of the University of Berlin in the early part of the last Century. What von Humboldt insisted on was that there should be in this reformed University freedom of teaching and learning, which was a radical notion at the time, and which led to the rise of the modern German university. And oddly enough in this Country, higher education which had modeled itself due to our origins on the British experience, began in the latter part of the Nineteenth Century to model itself more and more on the German university, but it was the German university of von Humboldt. Why? For example, what does freedom of teaching and learning mean? Didn't it exist before? The answer is that it essentially did not; that the university from its origins, including the English university from which the American collegiate sector descended was very much beholden to religious establishments, not necessarily a single one, but the religious establishment of the country in which the college or university was located; and freedom of teaching and learning meant more than the ability of professors to teach what they chose, and the ability of students to learn what they chose. That, in itself, was a reformist and fairly radical idea. It also meant that the university was supposed to be free, or faculties and students were supposed to be free of religious orthodoxy. What that meant is that at the time that this was established in Berlin, you still had cases in this country, which in fact lasted until after the Civil War, where young, or not so young, professors were expelled from colleges for teaching modern biology, or even asking questions that involved modern biology. Anything that questioned religious orthodoxy was regarded as a taboo, and the von Humboldtian freedom was freedom from religious orthodoxy.

von Humboldt did not mention research. Research, in fact, is something that faculties have done for a long time. But, why do they do it? How did they get involved in it? First of all, if you were a learned person, you were also curious, and in order to advance your own knowledge, you did research, because it was interesting. Then you involved your students in it, because it was a way for them to get deeper into their subject, which was also your subject, and to become proficient in it, and over time it then became a criterion of a scholar in the making, a scholar in the making who should be capable of making a contribution to knowledge — something that was either new or, at least, original in conception. Now so many people are getting PhDs, we have almost forgotten that the basic criterion for a doctoral degree is traditionally still to demonstrate a capacity to make a contribution, an original contribution, to knowledge. That in effect means doing some research, but I want to stress here that research was not being done for its own sake; that the university and faculties did not in the Nine-

teenth Century set out to unlock the mysteries of the universe. They certainly did not set out to contribute new knowledge to society. They set out to enhance scholarship and reinforce the teaching mission of the university. It is worth remembering that with everything that we do historically, universities are teaching institutions, and that the fundamental reason for almost everything we do is that it relates to teaching. The notion then grew and has now become in the research universities sacrosanct that there is an indissoluble marriage between teaching and research; that the most-qualified instructor is that person who is an investigator in his own discipline because that is the only way he or she can really probe it to its utmost and advance intellectually and academically to the utmost; that to involve students in that approach, which is a research approach, is the best way to teach students, and that the best way to learn is to participate in the kind of inquiry which you can call research which probes evermore deeply into a subject and tries to push it as far as possible. You can call that research. It is research. But, remember it is research based on the fundamental teaching obligation and on the intellectual enhancement of the investigator.

The second piece of university background is that the university traditionally has been, in this country, a corporation, but it really does not historically resemble a business corporation very much. At the heart of the university is still the notion that it is a collection of scholars and, of course, without the scholars there is no university. A president, or students without instructors, would be meaningless and it is that which is behind that famous statement that the Columbia faculty is alleged to have made: "Sir, we are the university." That's also important because from that standpoint, universities have had employees for a long time and right now we have a great many employees. They are people who maintain the buildings and do various other things. Within the university, you could talk about employees but the faculty would never consider that you are discussing them. They are not employees. They are in fact, from their perception, fundamentally the employers. If they need administration, it is to make their work better. They don't work for the administration, the administration works for them; and lest some of you smile at that, you should be aware that, of course, the American university tradition, to a significant extent, is part of a Western university tradition, and the notion of full-time, long-term administrators in universities is a fairly new and largely still an American idea. The traditional university is governed by a rector, who is selected largely by the faculty, or at least that used to be the case until very recently, for a relatively short term; and the real gut of the institution is that

community of scholars who are the faculty. People have difficulty comprehending the internal dynamics of universities if they don't understand that faculty never consider themselves as employees but rather as employers, really, as the single, indispensible element in the institution. In fact, only recently has the notion to some extent disappeared that students come to work with a scholar, rather than necessarily to attend that institution. Now maybe people do, in fact, pick Harvard or Hopkins or Stanford, because these are "great universities" but at the graduate level, they still tend to work with Professor X or Y, who is unusually distinguished in that field, and if that Professor moves, that's likely to play a big role even if he moves from a high-quality institution to another institution of high-quality.

So, what you have is a tradition also of research that is focused on the faculty member, who is not an employee, who is part of a self-governing community of scholars, and who enjoys historically an extraordinary autonomy. Corporations that I have talked to often do not understand that there is such a difference between the discipline of employees in the corporation and the lack of discipline from their perception of faculty within universities. But, again, look at the background. In order to become first-rate and in order to become well-known, scholars investigated and were encouraged to publish. In fact, a doctrine grew up in this peer governance of faculties that no one who did not do research was really worthy of being promoted to the highest rank. This is the origin of the famous publish or perish doctrine. But, the university really did not pay for the research. The research was undertaken by the individual faculty member and the university allowed the individual to use some resources, but largely those resources were there because it helped the university to have the individual scholar do the research. And, if the research resulted in a best-selling book (and that's possible if you think of textbooks), the university never claimed any financial interest in that type of economic reward. People who are worried today about some rich faculty and some poor faculty ought to remember that there have always been scholars who struck a mother lode by writing the definitive textbook in their field and that the university traditionally never shared at all, and does not, to this day, share in the fruits of publication by members of the faculty. It is interesting that people talk of universities as being big, federal contractors, but almost all of those grants — although they are technically made to the university — are really made to the principal investigator, who is the individual scholar.

I'm just trying to give you a feel for the fact that faculty are not employees; that there is a big argument about what the university pays them for. It pays them to teach and to be distinguished. It is their

job to become very proficient and distinguished. The university should support them in that effort, and, if they reap a financial reward traditionally, that's been a piece of good luck, and they are entitled to it.

There are a lot of other things that go into this, such as the fact that in the Nineteenth Century the bulk of people on faculties were paid so little that they had to have external sources of support to begin with. It is only relatively recently, mostly since World War II, that we have had a bourgeoisie movement of faculties: people like myself without external means, who have actually tried to live on their salaries, and whose economic motivation was quite different from their predecessors who had independent means or they could not have afforded to teach at all. Also universities have permitted their faculties — or rather faculties have insisted on being able to consult. If somebody was very good at something and somebody else was interested in that, you could hire that person. We have all had a tradition, written or unwritten, for a long time that faculty members are free to do that. Normally now the practice is the equivalent of one day per week, per year, roughly fifty-two days a year. And, the university has not in the past required the consultants to report their activity to the university, or expected to participate at all in that consulting income; and people have been doing it for years. There is a peculiar attitude that goes with this because at universities some applied research got done. People said "Hey, you're bright in this. I'm interested in it. How about looking at a problem I want solved?" Faculties have done that for a long time. They usually had not even asked the university administration; what business of the administration was it? They worked on it in part because it was a game. It was an interesting puzzle to solve and sometimes they got paid to do it. In the past issues that are now arising, issues such as proprietary rights, really never arose.

Let me conclude by presenting a set of historical reflections on some of the fundamentals that still color university attitudes and faculty attitudes. First, teaching and research are still regarded as inseparable. That, as I said, has become a sacrosanct fundamental assumption that teaching and research cannot be separated. And that means that from the standpoint of the university, the business of advancing knowledge is rooted inextricably in teaching. Universities are not institutions that are founded either to solve problems or to push back the frontiers of knowledge. That happens as a result of universities, but that is not our motivation. We are not the Rand Corporation or The Hudson Institute or a "think tank." We are teaching institutions, and the advancement of knowledge comes, as I say, out of the teaching process. It is also a deeply cherished article of faith, or fundamental assumption, that the research in which members of the faculty engage must

be freely selected by them because only free selection assures, first of all again, whether people remember it or not, that the teaching role will be properly executed and that the mind remains free to investigate what is most interesting. Therefore, nothing must be sacred, nothing must be prescribed. But you can begin to see there is some question of what happens if the wrong incentives are there, and people are lured to pursue one direction of inquiry rather than another. Ideally, the faculty members' curiosity and intellect select the area of research, and, in fact, then it follows from that, although it is not sacred, (it is just a practical conclusion that a lot of people reach), that the more relevant or useful the results of research are, the more suspect is the motivation of the faculty member who goes into it. Ideally, you stand by a blackboard, and you think, and you think, and you think, and you figure, and you do it for the sake of doing that to enlighten yourself, and to enlighten your students. You are not doing it to solve a problem for anybody. And if you do happen to solve problems, are you really doing that for somebody else? Are you still pure? Are you still what you ought to be — a teacher and scholar — that is married to a third, again, sacred assumption and that is that research must be open within the university community, in fact, ideally within the whole national and international community of higher learning and research. Why? First of all because if it is not open, the teaching function is restricted. You cannot bring the student along to a certain point and then say "I'm sorry, but you know now we enter the area of secret or magic." You have to be able to bring that person as far as that person's mind will go. You cannot have closed areas. Also, it turns out that the best results, very often come from interchange, much of which is random or unstructured, even coincidental. It is the person maybe in a different field, or in the lab next door walking in saying "Hey, what are you doing?" and you explain what you're doing, and the guy says "That's interesting, I wonder how that would relate to what I'm doing?" and all of a sudden you've got a marvelous intellectual synthesis that produces a great result that nobody ever dreamt of. That's of course impossible if the guy walks into your lab and says "What are you doing?", and you say "Sorry, I can't tell you." And finally, the notion of restricting knowledge is one that again implies that the motivation is not academic. Well, what does that mean? The motivation is centered around teaching because why should anything be restricted in the process of teaching. We have had a lot of experience in these areas since World War II, because we have become research universities, in the current sense, essentially since 1941 by working in the national interest for over thirty years, mostly for the federal government; and certain practices were established because the government in the national

security required secrecy in certain areas. Some universities are in the business of either operating or only in operating secret research. But in order to be able to do that at all, and Hopkins is one that does it, the secret research has carefully been segregated from the teaching campus. We have a laboratory in Howard County, Maryland, that does a great deal of classified, (more elegant than secret) research, for the Department of Defense, specifically the Navy. The people who work there are not professors, do not normally teach, and the laboratory is miles from the teaching campus. There are some people who would still argue that we should not even be doing that. But, the point is, the universities generally have established rules in response to governments, saying "No Secret Work On Campus — No Closed Laboratories On Campus". By "campus" they mean the teaching part of the institution. There is, of course, an irony in this that we all are not coming to grips with and that is that the best faculties and the best universities which are most conscious of this tradition of open research and the relationship of teaching in research would take the view that making money from research is suspect. However, being supported to do research is good and so we are now on our way to a very interesting rationalization, which is that because the research needs to be supported, and faculty members realize that there are limits to which the institution can go as that support has become so expensive, that it is proper to link an interest in the research that one does to support. But one does not want to be in the for-profit business, even if there were no IRS and if that were not a "no-no" for other reasons. In fact, the best faculty members will at least say, and sometimes mean, that their interest is in having their department and their laboratories supported, not in enriching themselves, and you see then what they do becomes a way of gathering support for their students, for their laboratories, for their research, and that's good. Making money from what you do, is not good. Because if you wanted to do that, you would work for industry.

There are still very interesting questions about whether university administrations should be told that faculty members consult and for whom, and for how much? Should universities now share in the proceeds from writing? If they don't share in the proceeds from writing, should they share in the proceeds from consulting? Should universities invest in what their faculties do? Surely that is totally corrupting in terms of the tradition that insists that your fundamental motivation is to advance your own knowledge and that of your students. How can you do that if the university has an economic stake in what you are doing. It is only supposed to have a stake in your fame; in your intellectual quality. It is not supposed to seduce you into pursuing a line of

inquiry when maybe you and the world would be better off if you were free to pursue a totally useless line of inquiry. It is that kind of thinking that makes us so quirky to deal with, and I hope you end up feeling a modest amount of sympathy for those of us who are now administering these institutions, because any thought that we can easily tell our faculties what to do is, of course, quite mistaken as long as they think they are employing us. We serve them. We have to persuade them that we are serving them well. If they get angry about something and are uncooperative, they can be an enormous obstacle because, in fact, not in law, but in fact, faculties are far more capable of ridding themselves of administrators who seem not to serve them well then administrators are of ridding themselves of members of the faculty.

We come from an interesting tradition and I hope you have enjoyed hearing a little about it. I'm sorry I couldn't be more precise.

Thank you very much!

PROFESSOR AS CONSULTANT: CONFLICT OF INTEREST?*

BY JOSHUA LEDERBERG**

My assigned topic is the potential conflict of obligation on the part of a professor at a university who also undertakes private consultation with a (for-profit, commercial) firm. My focus is the potential for abuse of professorial privileges, those which arise from the social interest in sustaining universities as centers of unfettered teaching, scholarship and research which adds to the body of knowledge socially shared. My orientation is similar to that of the constitutional charter for patents, namely to legitimate well-regulated incentives for private gain with the objective of enhancing useful knowledge, protecting the core goals of the university, and leaving moderate economic incentives for commitment to academic versus other careers. My discussion will mainly have to do with the private obligations of the professor: other speakers will have reviewed extramural contracts made by the university as a corporate entity. The obligations and tenure of university faculty are more a product of evolving tradition than formal code. Schools of engineering, business and law have long since worked out a reconciliation of many of the value conflicts, especially as between teaching and industrial service, and these are often mutually synergistic. The sudden expansion of interest in the applications of biology and other basic sciences raises new questions: conflicts may well arise between proprietary applications and research traditionally in the public domain, and substantially funded from public sources.

No one is likely to quarrel with the social merit of providing academic expertise to private industry.[1] Besides its indispensable con-

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**President, The Rockefeller University.

[1] Coleman, James S., 1973. The University and Society's new demands upon it. Chap. 8, pp 359-399 in Kaysen, C. (ed.) Content and Context: essays in college education. Carnegie/McGraw Hill 1973.

tribution to technological innovation and efficiency, that independent expertise should also enhance the responsible authenticity of industrial claims for their products, and accelerate early awareness of possible public hazards. This remark is premised on the consultant serving as a detached expert, not a public-relations apologist. Some well founded public grievance may be founded on the depletion of experts able to speak on controversial matters with absolute and overt detachment, thus complicating if not frustrating considered policy decisions in fields like nuclear energy, pharmaceutical regulation and military procurement. However, I leave to other forums[2,3] the complexities of expert consultation to government, albeit this has raised the most vexing legal confrontations.

Hypothetically, consulting service could be retailed in many different ways. Where university facilities and staff are extensively involved — for example a chemical laboratory — it is inescapable that the university be a party to the contract. It might organize or affiliate with more or less independent research service groups still better able to aggregate supporting staff dedicated to industrial activity. At one extreme, it might even incorporate compensation to each professor for these efforts into a salary or commission scale. This style is however criticized for bringing extra-academic criteria into the university's preferences for faculty. The consensual doctrine is that support of technology remain a byproduct of scholarly excellence, and that any other course would eventually undercut the very quality of thought which is the prize of academic involvement.

Most universities have taken a pluralistic course. A few have affiliates in which some professors may voluntarily enroll. Many will allow for exceptional contracts embracing a well-defined area of work, negotiated principally at the initiative of an entrepreneurial professor. None will refuse contributions from a reputable firm; all will want to negotiate about intellectual property rights and other quid-pro-quo's when the contributions are other than charitable.

The 'byproduct doctrine' has also informed universities' policies about professors' consulting work. University corporate policy is generally neutral about extramural consulting, the major concerns relating to such obvious problems as excessive diversion of time from internal responsibilities, improper exploitation of the university's name

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[2] Lederberg, J., 1972. The freedom and the control of science — notes from the ivory tower Southern California Law Review 45:596-614.

[3] Lederberg, J., 1974. "A System-analytic Viewpoint" in How Safe is Safe? — The Design of Policy on Drugs and Food Additives. National Academy of Sciences, Washington, D.C., p. 66-94.

and reputation, coercion on students, and felonious conversion of university property for private gain. Universities are not eager to police the levels of external income received by faculty, so long as the stated pitfalls are guarded: there remains small controversy on this point, rather more about the need for routine prior disclosure of consulting work, and none that potential conflicts in decision making or with overlapping formal obligations be fully disclosed in context.

In a masterful essay, virtually uncited as far as I can learn, James S. Coleman[4] has amplified how the consulting relationship has become one of the important social functions of the university. In the absence of a well organized market, there is some likely to be a substantial misallocation of resources, the university's investment in facilities for and recruitment, screening, nurture, and job tenure of its faculty being a free good to the firm at academic pay scales. The question of reimbursement to the university aside, efficient allocation would require pricing at some multiple of routine academic pay. Following his reasoning, I would suggest a reasonable formula would be $150 to $300 per hour, shared evenly between the consultant and the institution. Even if these fees are not explicitly shared, they will become internalized into the incentive structure of academic employment, as happens routinely at schools of business and engineering, enabling universities to attract high talent at formal scales that would be grossly uncompetitive with industry.

Ideally, consulting will be intellectually stimulating, educational to the consultant (if only for its window to other sectors of our culture), and important to the firm's objectives and by that token to the social interest in keenly competitive innovation. In fact, professors today are so burdened with the most routine of administrative tasks, often with grossly inadequate infrastructural support that, per hour of time spent, consulting may be among the more intellectually demanding of their duties and have high operational utility in terms of tasks achieved.

In the past, most consulting has been extramural in every sense: the problems addressed came from the firm; the professor did the work there, not in the university laboratory; the professor brought general analytical skills and the interpretation of a body of widely shared information from the academic setting; the proprietary contribution was the firm's. In these circumstances, it is relatively easy to draw a sharp line between the intra- and extra-mural responsibilities and activities of the professor; and we could then sustain a laissez-faire posture on the consulting relationship.

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[4] Footnote 1, *supra*.

New problems and conflicts arise out of the emergence of proprietary values from the academic work of the professor. Our task now is to sort out the assertions of various claimants to those values; and there are inevitable side-effects beyond the allocation of the fruits when significant sums are involved or even imagined.

To do this now requires a reexamination of the relationship of the professor, for example as employee and at the same time as part of the governance of the university corporation. Many aspects of that relationship are rooted in traditions that go back to medieval times, for example in the immunities that stem from ecclesiastical and sovereign protection of university faculties.

The professor as teacher gave little opening for a university-corporate claim on the intellectual product; so there has been virtually no effort by institutions to recover income from copyright, even when substantial university contributions were given in the form of secretarial assistance, library, and so on. One can argue for the social utility of encouraging the extra effort of writing textbooks — even if for profit — and should not forget the eventual internalization of these fringe opportunities into the overall compensation structure. To be sure this means the non-literate professor will, on average, earn correspondingly less. However, if a colleague is envious, that colleague can write his or her own book; we pass by such abuses as compulsory assignment of books to one's own students — matters such as these are quite reasonably dealt with through peer sanctions. Furthermore, the teaching responsibility can be reasonably well calibrated; and overt neglect will be visible and accounted.

Scientific scholarship today is however dependent on very high institutional investments to allow research to continue. Besides capital investment in space and instrumentation, there are enduring commitments to support personnel, and a host of indirect costs ranging from shelter, libraries, power and light to public relations and liability insurance. Investigators are happily oblivious of this corporate umbrella (except when it fails). These support structures are costly to the institution and indispensable to the researcher. They are inevitably rationed; and it is an institution's grave responsibility to ensure that these investments are allocated to the most competent and most effective talent. Ultimately they are of course a social investment, whether immediately from government grants or indirectly through the civic, third-sector tax-lenient system that has been so creatively productive in this country.

It is these investments, and especially their opportunity costs vis-a-vis alternative allocations that justify the university's interest in the patent rights and other intellectual property generated by its

professors in the course of their academic work. This is of course just the starting point of a negotiated balance amongst the relevant interests. The purpose of university regulation is not only to recapture possible profits, but mainly to sustain a system of incentive and reward that sustains the essential values of the university as a community. There is of course substantial competition and privity in science despite its dedication to public knowledge as its end aim — this is built in to the attribution of talent to proven competence in critical discovery, and this is in turn indispensable to quality control and the effective allocation of resources. The main shortcoming of the current peer review system is its excessive preoccupation with pre-designed projects; nevertheless the community as a whole still operates very well. The short-run competition for 'glory' is a constructive incentive of proven use: it has helped more than hindered the social goals of scientific research, only marginally interfering with the timely publication of new results, the only way that glory can be gained. The pursuit of profit follows different, unfamiliar rules; and there are well-founded fears that gross disparity of rewards may motivate the deviation of a laboratory's programs to secretive, short-run, scientifically less fruitful aims.

True, 'profit' is likely to be correlated with social utility. However, that is precisely what the industrial sector is all about; and I would urge that we not get our lines crossed. We should sustain the university as a fount of more fundamental, publically available knowledge; leave to industry its particular challenges, for which I believe it is better organized in any case; and be sure to maintain patterns of authentic interrelationship that leave each side well able to do its special task. I suspect that this will evolve just that way in the long run, provided that social support for the university system can be sustained. It is not likely that will come about from royalties on patents; and if we depend on industrial contracts we may indeed starve out many more fundamental lines of work that have no short run proprietary appeal. A modest percentage of support from such contracts can however spare other funds, and provide interesting stimulation along other lines, and I see no reason not to continue to seek them up to the limited level that I believe they will in any event be forthcoming.

The current craze of professional entrepreneurship is, I suggest, an aberration in two respects: biotechnology as a technical discipline caught industry dozing, and we are just now watching the transient of major firms' catchup of their in-house capabilities. Second, in that same transient, we have been observing a Wall-Street as much as an industrial boom: the disillusionment of the capital markets and the

actual productivity of established enterprises will be a spontaneous corrective to the distraction of academic interest to entrepreneurial games that we have seen in the last few years.

The statement of these principles is easier than their implementation. The separation of intra- from extra-mural know-how is not so clearcut in the new fields where industry is depending so strongly on academic initiatives. As the pharmaceutical industry becomes better grounded on fundamental science, this dependency will be deepened. There will be aggravated temptations for the involvement of graduate students in work that is driven by a professor's private consultorial interest; but this transgression is not likely to be condoned for long either by students or by colleagues. It will not be easy to police the source of know-how conveyed by a professor as consultant. However, if the university community has discussed these details, I believe common-sense solutions will emerge. And any firm, knowing that the university has avowed a potential claim, will of course be prudent to take its own steps to avoid future conflicts over them. Ideally we will return to a pattern where most professors can draw a clearly delineated boundary between their academic and industrial interests; and if not, that they will have discussed their problems and achieved a clear understanding with the university governance about their individual cases.

There remain complications where the University itself has a proprietary interest, either by its implicit rights as employer-investor in internally funded work, or derivative of a contract with government or another sponsor. In the latter case, the use of university facilities for an agreed corporate purpose has been agreed to. Should the professor then receive additional compensation as an independent consultant, in an overt complication of the intra- vs. extra-mural rule? There are arguments on both sides, including the fact that the professor has surely foregone other consulting opportunities.

Where no third-party sponsor is involved, the university still has a proprietary interest in intra-mural inventions. (A contract spells out the obligations more clearly but does not generate the interest.) In principle this might already be a source of hindrance to publication that would frustrate patent filings. Does a professor have any obligation to the university to cooperate in the pursuit of a patent, by delaying publication? by diligently pursuing lines of development that were not part of his or her primary research plan? by outrunning potential rivals to the university's patent? And what if these secondary obligations were complicated by a consulting interest? As far as I know, universities have not so far pressed their interests to these kinds of issues. This is perhaps wise; but there are then likely to be posterier

recriminations if large sums should be involved. On the other hand, many professors will be rightfully aggrieved if they are given to believe they have a positive obligation to pursue patents as more than an incidental side effect of their work. It would seem reasonable that the university expect as much diligence for its interest as a professor shows for any other property interest, a principle easier stated than enforced.

Considerations like these contribute some force to the proposal of open divulgence of consulting relationships, including consulting income. The pros and cons are mainly pretty obvious: there is an intrusion on privacy; there is also the protection to the consultant of having attributable conflicts on the record. There is the invidious hazard of having individual fees (and salaries) on the record. If uniformly practiced, certainly we could live with open declarations; indeed this might well open up the market (precisely through the invidious mechanism) and increase average fees. How to enforce such procedures and in turn how to prevent new frictions from strictly procedural infractions have to be thought about. Certainly there should be mechanisms to encourage such revelations to discreet nodes in the supervisory chain as a protection to all parties' interests.

Finally, we recall that there are other workers besides professors on the campus. Does a student who uses university facilities have the same obligations as a professor. If that student pays tuition? Conversely if she receive a stipend? Similar questions also apply to collaborating investigators (who may have a primary contractural obligation to another university), to postdoctoral fellows, to guests who are not in an employment relationship.

It is no novelty that many dilemmas attend any such Question of Property.

THE UNIVERSITY-ACADEMIC CONNECTION IN RESEARCH: CORPORATE PURPOSES AND SOCIAL RESPONSIBILITIES*

EDWARD E. DAVID**

We are entering a new era in the way scientific research is managed and supported in this country. And the most outstanding feature of the era will be the growth of industry-supported research in our universities. I have for some years advocated a closer connection of this kind, though I did not foresee the spectacular chain of events in molecular biology that have added such impetus to it. These have livened the debate about age-old ethical issues and the role of universities in commercial activities. Yet on balance most of us would agree that our molecular biologists have presented our society with problems of the kind we like to have.

As a corporate spokesman on your program today, let me begin with some observations about the economic engine which will actually deliver the benefits of recombinant DNA technology to people. It is an oft-repeated view these days that the United States is the undisputed world leader in the *generation* of knowledge through research, but that in recent years we have fallen down on the even more important job of *using* that knowledge effectively in support of economic growth. As some of you may know, I have from time to time said that one of the reasons for this failure is that the United States graduates *less than half* as many engineers as the Japanese per capita and *twenty* times as many lawyers. For the duration of the morning, at least, I would like to downplay that view.

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**President, Exxon Research and Engineering Company.

Recognizing this technology delivery problem, the universities accept their social obligation to facilitate commercial applications of their discoveries. This point was featured prominently in the summary of discussion that came out of the Pajaro Dunes Meeting, a meeting called by university presidents of five leading research universities to discuss issues raised by research connections between industry and academia. Clearly, the universities also want to share the spoils of their research. Balancing obligations and rewards with all the obvious ethical issues is an exacting task. Now let me set the theme for my remarks.

Theme

An increase in industry-supported academic research is economically and socially desirable. As a matter of fact I have advocated *tripling* industry's support over this decade from about $200 million to about $600 millon a year. This would mean an increase from just about four percent to about 15 percent of what the federal government provides, assuming government support remains constant in real dollars. I should emphasize that I am not talking about industrial philanthropy, but about research consistent with a commercial "mission." I advocate this increased coupling because there is fine science and technique created in academia which is not effectively coupled to the nation's commercial innovation system. There is much to be gained for both academia and industry by increasing the coupling. Company and campus can strike bargains that offer strong mutual benefit — not *win-lose,* but *win-win* deals.

What stands in the way of win-win deals? The most important obstacles are cultural differences and the different objectives of the two. Industry is output oriented; industrial managers aspire to efficient production of goods and services. To the industrialist, paying for research implies ownership of the results, which are used to establish proprietary competitive advantage if at all possible. Industry wants to limit risks, financial and social; risks must be assessed, numerically if possible, and then balanced with the rewards for commercial success.

On the other hand, university faculty and administrators consider themselves as communities of scholars. The primary research aim is the creation of knowledge. Educational values are important. There is a tendency to be adverse to commercialization, seen as exploitation of the public by some academicians and public interest groups. Still, academic institutions usually want to participate in the payoff from their research, though they often express the desire to serve the "public good" not "special interests." This means that they favor actions that

presumably would spur competition and not confer proprietary advantage on any one player.

It is significant that there are wide differences in academia in regard to these matters. An indicator can be drawn from a study by Martin Lipset of Harvard. That study showed that the disciplines most aligned with conservative political ideas and favorable to the private sector are engineering, medicine, and chemistry. The opposite pole is occupied by social sciences, physics, and mathematics. Significantly, the most intensive industry-university relationships have been in engineering, chemistry, and medicine, and the least intensive relationships in physics, social sciences, and mathematics. On the industry side, larger firms with long-range outlooks, fairly secure in their commercial positions, have been the dominant players.

But even in engineering and chemistry, establishing links between industry and academia is often fraught with suspicion and ignorance of the other's ways. Into this situation steps the lawyer. He or she can play a key role in constructing realistic agreements by helping the client recognize that all the traditional values of either party cannot be protected absolutely; some risks are inevitable. The lawyer can help both parties recognize that ownership of a single patent is not likely to be critical.

There are some exceptions. One example on the industry side was Carlson's original patent on xerography. On the university side, I might cite the University of Wisconsin's 1927 patent on a process for manufacturing vitamin D, which brought the university some $14 million from 400 licenses. Or I can cite Indiana University's patent on stannous fluoride which brought the world Crest Toothpaste and the university $2 million from the licensee, Proctor and Gamble. Such exceptions are a risk. Nevertheless, a portfolio of patents plus the know-how acquired in R&D usually provides the commanding position. So exclusivity is not usually critical, particularly on patents originating from basic research.

The lawyer can help universities recognize that reasonable publication delays for protection of patent rights are very seldom critical to achieving precedence for discovery in the scientific community. And such delays are critical for patenting. As you may know, if information about an invention is disclosed publicly in any way, the chances of obtaining a patent afterwards in most countries of the world are seriously compromised. The lawyer can also point out that if the partners' interests are reasonably well-matched, such research agreements are not likely to change the direction of academic research substantially, except as dictated by bona fide research results achieved by industry and made available under the agreement.

Finally, the lawyer can help industry recognize that the most productive research requires some freedom of action by researchers themselves. When research is programmed too tightly, micro-managed we might say, poor research is often the result. The desire for creativity is why industry goes to academia.

Thus the lawyer can and should play a key role in balancing conflicting interests by detailing risks, assessing their importance against the possible benefits, and helping clients recognize that different solutions are appropriate to different institutions, different stages of research, and different businesses. In other words, the lawyer should be an important member of the negotiating team. The principals need not adopt the strategy of first working out the deal between themselves and leaving their lawyers to clean up the mess. However, as you will realize, there are increased risks for lawyers and the legal profession in taking an active negotiating role. I would be interested in your opinion of how far lawyers can and should go. "Can" because it takes keen judgement based on knowledge of commercial innovation to advise clients, "should" because of professional ethics.

Now for the details. First, more about industrial objectives in these agreements; next, a comparison of some specific agreements, and finally some comments on desirable directions for industry support of university research.

Industry's Objectives

We cannot consider industry objectives in funding university research in isolation from industry objectives toward higher education in general. In order of importance, industry looks to higher education for: a steady supply of *well-educated* graduates; relevant basic science, and scientists able to offer fresh insights; and, sometimes, technological ideas and leads. Graduates are by far the most important. Of the professionals that Exxon hires in a typical year, more than 70 percent are likely to hold degrees in engineering or science. Many hold advanced degrees. It is our acute awareness of the importance of these educated people to Exxon's future that most animates our desire to be certain that higher education remains healthy. In 1982 Exxon will contribute nearly $30 million to higher education. In addition we will spend over $4 million supporting research in universities. Even in supporting this research our motives were strongly influenced by our interest in education, both on the undergraduate and graduate levels. Indeed, Exxon is probably not unlike the rest of industry in being at least as interested in promoting academic research *as part of the educational process* as in the results of that research.

Beyond excellent people, industry is interested in innovation rather

than in research as a *stand-alone* activity. Industry's interest in research is as an element of an innovation system. "Innovation" is of course the term for the entire process of taking an invention from the glimmer of an idea to a widely adopted, commercially useful process or product. Contrary to popular belief the invention and deployment of new technology does not usually begin with basic research. Can you name a Japanese Nobel Prize winner? The Japanese have in the past carried out virtually *no* basic research. Yet, as we have learned, the Japanese are a highly innovative people, and tough competitors. More basic research — nay, more R&D — does not automatically produce more innovation. The new socialist government in France has just announced plans to boost national R&D, as a percent of GNP, by about one percentage point — from 1.6 to 2.4 percent. The Canadian government is using R&D as a nationalistic rallying point. They will learn, as others have, that simplistic notions of this sort are usually ineffective in stimulating innovation.

Carrying this point a bit further, let me point out that advances in basic science depend on advances in technology. Galileo and Newton could not have re-defined the universe without the telescope. The dramatic advances in molecular biology in our own time would have been impossible without the electron microscope, x-ray crystallography, radioactive tagging, and chromatography. And solid state physics didn't become a major branch of science until *after* the transistor was invented.

The truth is that progress in science and technology hinges upon *connections* between activities from the purest science to the most mundane commercial operations. It is easier to *foster* those connections in-house and that explains why most companies do their research in-house, rather than going to research institutes or colleges and universities.

Connections focused on academic science do offer industry valuable opportunities. However, with its concentration on basic science, most university research is not geared to invention and innovation. That is why colleges and universities have never earned large sums from patents and licensing. Their ideas usually require too much development work and entail too much risk to be commercially attractive. Biotechnology may be an exception, yet no one can doubt that expensive development efforts lie ahead in this field as well. We're already beginning to see a shakeout among fledgling genetic engineering companies built more on hope than on technical substance and managerial expertise.

In short, the overriding goal for industry is the delivery of goods and services to the public, governments, and other consuming institutions.

Most academic people recognize this as the primary industry function, and it is that recognition which can serve as the base for agreements between industrial and academic partners.

Forms of Research Agreement

Now, granted that a company intends to sponsor university research, what form of agreement should be sought? There are many possible modes. For Exxon's part, we have become involved in more than twenty over the years, including such familiar ones as summer jobs for students and faculty, direct grant programs, industrial affiliate programs, consultancies, contract research and faculty advisory groups. Let me consider the advantages and disadvantages of two kinds of arrangements.

The first is the research consortium. Some consortia have been in existence for several years — for example, the Carnegie-Mellon Processing Research Institute, the University of Delaware Catalysis Center and the MIT Polymer Processing Program. More recently, in the glamor field of integrated circuit research, Stanford has excelled, snaring a reported $10 million in funding from some 14 corporate sponsors for its Center for Integrated Systems. Cal Tech, MIT, the University of California at Berkeley, and Cornell have undertaken similar programs. A comparable industry initiative is the $20 million program just announced last week by the Semiconductor Research Cooperative, headed by Eric Bloch of I.B.M. The cooperative will pool monies collected from some 50 companies to support long-term university research related to semiconductors. Another important objective of course is to increase the supply of faculty and graduates.

The research consortium is clearly popular with industry. It represents a low-cost, low-risk option for ensuring that basic research of importance to industry continues or expands. It also represents a low-cost, low-risk option for the universities, because it scarcely threatens their traditional concerns, values, and interests. With many companies involved, none is in a position to exert a strong influence on research directions. For similar reasons there are few problems with publishing results, though there can be delays to allow for patent filings. Industry participants are almost always willing to allow universities to hold the patents. Enough companies are usually involved that company demands for exclusive licensing would not have much point. Only a few faculty or public interest groups seem to object to the usual royalty arrangement: either the contributing companies acquire the licenses royalty-free, or their contributions are considered prepayment of royalties.

Stanford has also helped pioneer a somewhat riskier approach that

many enable universities to profit more from their research. Six companies have been induced to put up an initial $7.5 million to form Engenics, a new genetic engineering company, headed by the former board chairman of ITEK, Frank Lindsay. This company in turn has granted 30 percent equity interest to a non-profit center for biotechnology research. The mandate of the center is to fund basic research related to biotechnology, mainly at Stanford and the University of California at Berkeley. In return Engenics obtains limited exclusive licenses on patents obtained as a result of that research. Such an arrangement provides some insulation for the university against conflict of interest. But here, as elsewhere, society must depend on the ethical traditions and the personal standards of the people involved. Making agreements public will exert a useful control.

But on the subject of risk, let me pose this question: if the research consortium is a low-risk, low-cost option for supporting university research, is it also a *low-benefit* option? Consortia seem to be giving the universities what they need most these days — the assurance of long-term support necessary to pay adequate faculty salaries, to keep laboratories up to date, and to support graduate students. But will they promote connections that will significantly spur *both* scientific progress and technological innovation? In particular is industry getting enough out of such deals, including the Engenics arrangement, that we can anticipate many more? I will not venture a direct judgment, *except* to mention another option that may be the "comer" in industry-supported research on campus.

I am speaking of long-term sponsored research programs like those announced between Monsanto and Harvard, Hoechst and Massachusetts General Hospital, and Exxon and MIT. Such agreements substantially increase opportunities for one-on-one exchange. In fact on the industry side, the motivation seems to be as much to develop the expertise and know-how of their own researchers, as to support the discovery of new knowledge. Furthermore, because there is more interchange, there is more chance that the science developed will have a bearing on company problems.

At the same time the risks are higher. A company must "bet" more money on a particular program if that program is to have enough scope to make a difference. Consequently, as part of its fiduciary responsibility to the stockholders, company management must have a voice in deciding who performs the research, and what the research addresses in order to ensure that it has a bearing on company interests. Likewise, if there are patentable discoveries, management must ensure that they will benefit the company in some proportion to the money at risk.

Given the higher degree on company *interest* — in all senses of that word — the academic researchers in turn risk greater pressures to divert their research in incongenial directions, delay publication, and grant more generous patent and licensing conditions. In my view, many of these problems can be minimized in the negotiating stages, with the imaginative counsel of the law.

Exxon's own research agreement with MIT continues a long tradition of cooperation between our two institutions, going back to the 20s and 30s and the days of Professor Warren K. Lewis. Professor Lewis and his students played major roles in several of our classic innovations in petroleum technology, including fluid catalytic cracking and synthetic rubber. Under the new agreement we think we have struck a fair balance among the competing interests. Exxon will provide MIT with between $7 and $8 million for research on combustion science over ten years. Exxon representatives will designate the research projects from among those that MIT proposes. But the two MIT professors who will direct the research, Jack Longwell and Adel Sarofim, will also have money to pursue combustion research projects of their own choosing. The amount will be equal to twenty percent of the money spent on the designated projects.

Research results will be published promptly and openly, although where patent applications are possible, the agreement permits a 90-day delay. MIT will have the first right to file patents on any technology that may be developed, but Exxon will have the right to use them without royalty and share the royalties from licensing to third parties. The agreement will nominally extend for ten years, though either side can withdraw after two years advance notice. All these details have been widely publicized.

We at Exxon think that the agreement is working well for MIT and for us. But we would not champion the terms of the agreement as standards. The watchworld should be *pluralism* — a diversity of arrangements reflecting the diverse interests and requirements of those involved. We are far from exhausting our fund of ignorance about the most effective ways for fostering the industry-academic connection.

I would offer these somewhat personal observations on the issues usually debated in connection with such agreements. In the matter of *control,* it is well for the company not to forget why it has come to the university. A wise industrial research manager is after unique individuals, different from, though complementary to his own people. The manager wants the research to run to daylight where he sees it. You can destroy creativity in straining to control it.

Publication ought not to be an issue, except occasionally, *if* the focus is on basic research. It is surely reasonable to delay publication to allow for the filing of patent applications. Not only will this give an academic institution a chance for some return on its research, it does no permanent harm to open communications in science. As you know, the purpose of the patent system is to *encourage* the communication of knowledge and technique. I suspect that some of the secretive behavior reported from microbiology meetings stems from a similarity with microelectronics. Microelectronics companies file relatively few patents. The field moves too rapidly, and it is too easy to "invent around" patents. The information in your patent may only make it easier for the competition. If that is the case, the problem may ease as biotechnology matures and as the perception grows that new technology is no longer "easy" to come by.

Patent *ownership* is less of an issue than the rights and conditions for licensing the patent. Unless I am mistaken, most companies are willing to let universities own the patents resulting from industry-supported research. The rub comes with the question of *exclusivity*. Sometimes overlooked is that exclusivity has advantages and drawbacks for both parties. While a company with an exclusive license is protected to some degree from competition for a time, the exclusive right usually confers an obligation to develop. While a university may prefer the more "democratic" strategy of non-exclusive licensing, the risks of development may be so great that what is nobody's exclusive license may turn out to be nobody's development.

I note that Monsanto will receive exclusive license to any patents resulting from the company's recently announced, $4-million, five-year grant to Rockefeller University. In our combustion research agreement with MIT, we elected *not* to press for exclusivity. However, we did want to ensure that we could practice the patents royalty-free as a price for funding the research and MIT accepted that argument. Probably, this issue must be negotiated case by case.

Plea For Industry-Supported Basic Research

To sum up my argument, powerful influences are combining to bring industrial and academic researchers together. To get the most advantage from the trend both will have to find ways to accommodate their cultural differences. Members of the bar who are wise in the ways of science and technology can serve both parties by acting as mediators dedicated to win-win agreements. Agreements will and should take a variety of forms, reflecting the extraordinary diversity of the nation's industrial and academic institutions.

It is all too easy for the funders and the performers of research to become polarized. Preoccupation with commercial dogmas on the one hand, preoccupation with the doctrines of academic science on the other, can block progress. Accommodation has almost always been between those extremes, even where government is the funder.

Because so much of the controversy does swirl about commercial questions, let me close by entering a plea for more focus on agreements supporting *fundamental* research. Times are changing but both academia and industry seem to require more selling on this point. The country will spend some $80 billion in R&D this year, and of that well over two-thirds will go toward development work. And, typically, some 20 years pass from the inception to the deployment of a major new technology, although in some fields such as electronics, half that figure may be more realistic.

The process is so expensive and so slow because we are receiving inadequate help from predictive science. In the petroleum and chemical industries, we typically must build pilot plants costing hundreds of millions of dollars to determine whether and how we can practice a technology on an industrial scale. The reason is that we still know too little about the structure and chemistry of hydrocarbons and this applies particularly to synthetic fuel resources like coal and oil shale. There are similar problems in other industries. Designers of aircraft and steam turbines spend heavily on wind tunnel tests because they lack a good theory of turbulence and materials failures. In electronics, development costs for high-capacity memory chips have skyrocketed because the developers lack understanding of the combinatorial mathematics that would reduce the time expended in designing and testing high-density circuits.

As a nation, we are entering a period of intense economic and military competition. Research in our academic institutions has long been an American strength. Academia, industry, and the nation have much to gain if academic research can reinforce our industrial innovation system. The members of this audience are uniquely suited to play honest broker to this coalition and I urge you to do so.

PROBLEMS OF THE TECHNOLOGY TRANSFER PROVISIONS IN THE LAW OF THE SEA TREATY*

THOMAS F. MARSTELLER, JR.**
ROBERT L. TUCKER***

Since the signing of the Constitution of the United States, *Congress* has had the power "to promote the progress of science and useful arts by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries."[1] The power has manifested itself in the form of a patent system. To date, over four million inventions have been protected by the U.S. patent system. The system now stands threatened by the United Nations Convention on the Law of the Sea[2] ("L.O.S." Treaty).

The Law of the Sea Conference is an international convention whose focus is on developing "a legal order for the seas and oceans which would facilitate international communication and promote their peaceful protection and preservation of the marine environment and the conservation of the living resources."[3] Articles 4 and 5 of Annex III of the L.O.S. Treaty mandate the transfer "on fair and reasonable

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**Associated with the law firm of Pravel, Gambrell, Hewitt, Kirk & Kimball, 1177 West Loop South, Suite 1010, Houston, Texas 77027.

***Juris Doctor, Franklin Pierce Law Center, 1983, Concord, New Hampshire.

1 Article 1, Section 8, Clause 8 of the U.S. Constitution.

2 U.N. Document A/CONF.62/122 of October 7, 1982. Reproduced in XXI Int'l Legal Materials 1261 (1982). On December 10, 1982 the convention was opened for signatures and 117 States signed the convention.

3 A/Conf. 62WP.10/Rev. 3, Third Conference on the Law of the Sea, 22 September 1980 at xxii.

commercial terms and conditions" of all mining, processing and transportation technology in the recovery of ocean minerals from private mining companies to the "Enterprise" of treaty nations. This not only threatens the private property of corporate entities, in violation of the Fifth Amendment of the United States Constitution, but also has the potential for rendering the mining provisions of the treaty useless because of the resistance of U.S. corporations to subject themselves to its domain.

This article will confine itself to the technology transfer problems of the L.O.S. Treaty and discuss possible solutions.

At this point a discussion of intellectual property (another name for technological information that is privately owned) is in order. Intellectual property includes patents, trade secrets, proprietary information and copyrighted works.[4] All such property has its price. Often companies spend large amounts of development money researching new processes and machines. Usually, if an idea meets the statutory criteria [i.e., Title 35 of the United States Code] it is patented. Otherwise, the information remains proprietary acquiring common law rights whereby it is protected from unlawful misappropriation.

Trade secrets are the private property of their owners. There is no time limit placed on the secrecy of the information and owners are free to sell or license it as they do patents. Since not all technical information meets the statutory criteria of a patent monopoly, industry relies heavily upon common law trade secrets to protect much of their proprietary information. The advantage of trade secrets is that there is no fixed time period for their effectiveness, unlike patent grants which have a seventeen year "monopoly" limit in the United States. However, no protection is afforded trade secrets against independent development or reverse engineering. Since the common law governs trade secrets, advantages and protections accorded trade secrets vary slightly from jurisdiction to jurisdiction in the United States. The United States Supreme Court in *Kewanee Oil Company v. Bicron Corporation,*[5] held that the patent system does not pre-empt state common law trade secrets and that the two protections can co-exist.

Complementary to trade secrets are patents, which are 17-year monopolies prohibiting all others from making, using or selling the patented invention. There is a high price exacted for the awarding of a 17-year patent monopoly: the invention becomes public information to be used freely after the 17-year period. The theory behind the 17-year monopoly is that inventors should be granted this time period to re-

[4] For a good overview on the subject see 77 West Virginia Law Review 525.

[5] 416 U.S. 470 (1974).

coup their research and development costs and profit from the invention. The system thereby provides incentive to invest capital and thus advance technology. The scheme boils down to a reward for a reward; the public is enriched technologically in return for a grant to the inventor of a 17-year monopoly on the use of the particular technology.

Having ultimate control over patent monopolies, the U.S. government can and occasionally does require patent holders to license valid patents.[6] Without argument, it is accepted that a government has the power to acquire private property, if necessary, to satisfy needs of the government. This is not a "taking" in the sovereign sense, since just compensation, guaranteed by the Fifth Amendment to the U.S. Constitution, which states "private property [shall not] be taken for public use without just compensation," accompanies these appropriations.

The various protections afforded intellectual property are comforting in the confines of the territorial U.S., providing security and hence incentive for private industry to invest in research and development. These protections, however, have little effect outside the United States. Even a patent monopoly would be hard to protect outside the United States although there are remedies for foreign infringement, such as enjoining the importation of illegally produced goods. For example, 19 U.S.C. §1337a effectively extends patent protection by restricting the importation of goods mined "by means of a process covered by the claims of any unexpired valid United States letters patent." But in a situation where much needed raw materials are being produced by an international enterprise in violation of an American patent, it is doubtful that a court will enjoin the importation. Conceivably, raw materials could also be funneled through other nations to conceal their origin. Of greater doubt is the ability to protect common law trade secrets outside the United States, where the ocean mining will occur. Although we have identified the underlying issues basing the analysis on protection of American intellectual property, the same problems exist in all other L.O.S. Treaty nations that have legislated protections for intellectual property (most of the participating nations). However, no other nation has found serious fault with the technology transfer provisions of the Law of the Sea Treaty.

Under the Law of the Sea Treaty, the technology transfer provisions require a private mining company or consortium to transfer to the "Enterprise" all of the company's technology, covering operations from mining to marketing. The "Enterprise" is the organization of countries that will compete with private-sector companies in mining, transport-

[6] This is a sometime occurrence in large anti-trust cases. See, for instance, the FTC's monopoly case against Xerox. ATRR No. 725, p. A-5 (1975).

ing, processing and marketing minerals from the seabed.

Since patents are public knowledge as of the date of issuance and since one cannot deter infringement of a national patent outside the boundary of the national grant, trade secret or know-how protection is the most problematic aspect of the mandatory technology transfer provisions of the L.O.S. Treaty. Since the value of a trade secret is directly dependent upon its secrecy, an unrestricted transfer to the Enterprise would reduce or possibly even destroy the economic value of the trade secret to the mining company for subsequent licensing. The potential for an unlimited period of secrecy and value runs afoul of the benefits expected from the technology transfer provisions.

Once technology has been transferred to the Enterprise without confidentiality restrictions, the Enterprise and the Less Developed Countries (L.D.C.s) will have access to the technology. The desired effect is to stimulate the formation of new mining companies in the L.D.C.s by reducing the initial capital outlay and time required to develop the sophisticated deep-seabed mining technology. The provision for transferring technology to the Less Developed Countries was incorporated in the Treaty in the hope that this course of action would eventually lead to increased competition between the technology-rich countries and the L.D.C.s and add to the general store of knowlege.

The heart of the technology transfer provisions is Article 5 of Annex III which, in brief,[7] requires that:

— The private mining contractors make available to the "Enterprise" all the technology they use in carrying out ocean mining at the request of the "Enterprise" on fair and reasonable commercial terms.

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[7] In its entirety Article 5 of Annex III reads as follows:

"ARTICLE 5
Transfer of Technology

1. When submitting a proposed plan of work, every applicant shall make available to the Authority a general description of the equipment and methods to be used in carrying out activities in the Area, as well as other relevant non-proprietary information about the characteristics of such technology, and information as to where such technology is available.

2. Every operator under an approved plan of work shall inform the Authority of revisions in the description and information required by paragraph 1 whenever a substantial technological change or innovation is introduced.

3. Every contract for the conduct of activities in the Area entered into by the Authority shall contain the following undertaking by the operator:

— If specific technology is not transferred, that technology shall not be used by the operator in carrying out ocean mining.

— Disputes concerning the terms of transfer are subject to compulsory dispute settlement or subject to effective measures, taken by a council or states involved in the mining of minerals in the Area, to ensure that the technology is made available to the Enterprise.

(a) to make available to the Enterprise, if and when the Authority shall so request and *on fair and reasonable commercial terms and conditions,* the technology which he uses in carrying out activities in the Area under the contract and which he is legally entitled to transfer. This shall be done by means of license or other appropriate arrangements which the operator shall negotiate with the Enterprise and which shall be set forth in a special agreement supplementary to the contract. This commitment may be invoked only if the Enterprise finds it is unable to obtain the same or equally efficient and useful technology on the open market and on fair and reasonable commercial terms and conditions;

(b) to obtain a written assurance from the owner of any technology not covered under subparagraph (a) that the operator uses in carrying out activities in the Area under the contract and which is not generally available on the open market that the owner will, if and when the Authority so requests, make available to the Enterprise to the same extent as made available to the operator, that technology under license or other appropriate arrangements and on fair and reasonable commercial terms and conditions. *If such assurance is not obtained, the technology in question shall not be used by the operator in carrying out activities in the Area;*

(c) to acquire, if and when requested to do so by the Enterprise and whenever it is possible to do so without substantial cost to the contractor, a legally binding and enforceable right to transfer to the Enterprise in accordance with subparagraph (a) any technology he uses in carrying out activities in the Area under the contract which he is not legally entitled to transfer and which is not generally available on the open market. In cases where there is a substantial corporate relationship between the operator and the owner of the technology, the closeness of this relationship and the degree of control or influence shall be relevant to the determination whether all feasible measures have been taken. In cases where the operator exercises effective control over the owner, *failure to acquire the legal rights from the owner shall be considered relevant to the applicant's qualifications for any subsequent proposed plan of work;*

(d) to facilitate the acquisition by the Enterprise under license or other appropriate arrangements and on fair and reasonable commercial terms and conditions any technology covered by subparagraph (b) should the Enterprise decide to negotiate directly

— Technology is defined as encompassing specialized equipment and technical know-how including manuals, designs, operating instructions, and training, technical advice and assistance, necessary to assemble, maintain and operate a viable system.

As George W. Whitney, then president of the American Patent Law Association, stated in his appearance before the United States Senate Foreign Relations Committee on March 5, 1981:

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with the owner of the technology and request such facilitation;

(e) to take the same measures as those prescribed in subparagraphs (a), (b), (c) and (d) for the benefit of a developing State or group of developing States which has applied for a contract under article 9, provided that these measures shall be limited to the exploitation of the part of the area proposed by the contractor which has been reserved pursuant to article 8 and provided that activities under the contract sought by the developing State or group of developing States would not involve transfer of technology to a third State or the nationals of a third State. Obligations under this provision shall only apply with respect to any given contractor where technology has not been requested or transferred by him to the Enterprise.

4. *Disputes concerning the undertakings required by paragraph 3 like other provisions of the contract, shall be subject to compulsory dispute settlement in accordance with part XI, and monetary penalties, suspension, or termination of contract as provided in article 18* of this Annex. Disputes as to whether offers made by the contractor are within the range of fair and reasonable commercial terms and conditions may be submitted by either party to binding commercial arbitration in accordance with UNCITRAL Arbitration Rules or other arbitration rules as may be prescribed in the rules, regulations and procedures of the Authority. In any case in which the finding is negative, the contractor shall be given 45 days to revise his offer to bring it within the range before the Authority make any determination with respect to violation of the contract and the imposition of penalties as provided in Article 18.

5. In the event that the Enterprise is unable to obtain appropriate technology on fair and reasonable commercial terms and conditions to commence in a timely manner and recovery and processing of minerals from the Area, either the Council or the Assembly may convene a group of States Parties composed of those which are engaged in activities in the Area, those which have sponsored entities which are engaged in activities in the Area and other States Parties having access to such technology. *This group shall consult together and shall take effective measures to ensure that such technology is made available to the Enterprise on fair and reasonable commercial terms and conditions.* Each such State Party shall take all feasible measures to this end within its own legal system.

> [t]he treaty's language, while inclusive of patents, reaches far beyond to include within its scope technological information which is normally treated as proprietary and highly confidential. Furthermore, the treaty reaches to expropriate broadly defined technology not owned by the user but only licensed....

So while the Treaty calls for fair and reasonable commercial terms and compensation when the Enterprise licenses technology from private concerns, it mandates that the technology *must* be transferred,[8] thereby foreclosing arms-length negotiations and not allowing equitable licenses to be structured. Any disputes occasioned by the transfer are subject to "compulsory settlement" and binding commercial arbitration.

At a hearing before the Subcommittee on Oceanography Richard A. Legatski from the National Ocean Industries Association stated that "several major equipment suppliers have already made it clear that they would simply refuse to enter into any transaction covered by the rules as now written."[9] Some of the major points of the suppliers' objections are:

— technology is defined much more broadly than in commercial practice, to include the very essence of the engineering skill which permits owners of an advanced technology to maintain a competitive advantage in the marketplace;

— employees of the "Enterprise" who misuse confidential or proprietary information after a transfer are subject to only token penalties, so the risk of commercial or military espionage is quite real;

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6. In the case of joint ventures with the Enterprise, technology transfer will be in accordance with the terms of the joint venture agreement.

7. The undertakings required by paragraph 3 shall be included in each contract for the conduct of activities in the Area until 10 years after the Enterprise has begun commercial production of minerals from the resource of the Area and may be invoked during that period.

8. *For the purposes of this article, "technology" means the specialized equipment and technical know-how, including manuals, designs, operating instructions, training and technical advice and assistance, necessary to assemble, maintain and operate a viable system and the legal right to use these items for that purpose on a non-exclusive basis.*" (Emphasis added.)

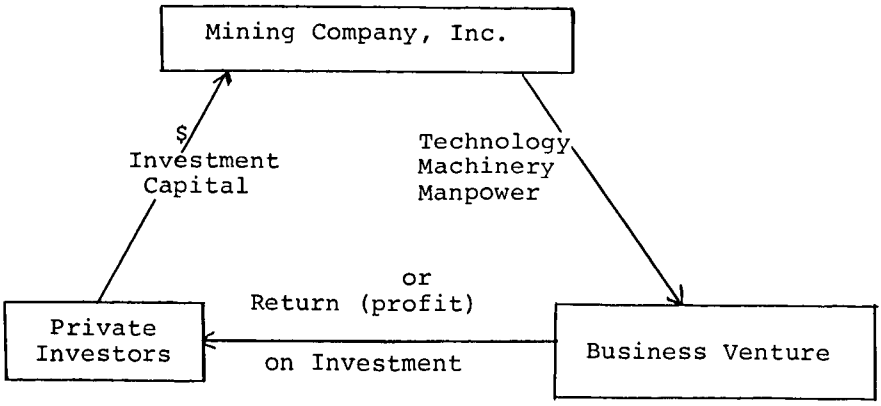
[8] See 3(b), (c), 4 and 5 of Footnote 7.

[9] Committee on Merchant Marine and Fisheries in the U.S. House of Representatives on October 22, 1981.

— since U.S. patent law is not extraterritorial in effect, there is no equivalent to "patent" protection on the high seas;
— should a loss of proprietary information occur, the Treaty text provides no compensation for the owner of the affected technology;
— any technology not made available to the Enterprise must also be withheld from the resource company which is seeking the right to mine in the first instance. Therefore, for want of needed equipment, the resource may not be able to conduct operations, and the technology supplier will lose a market.
— the burdens imposed on technology suppliers would create a disincentive to innovation, thereby damaging the economies of all nations at least indirectly.[10]

A non-believer in a capitalistic system might have a difficult time appreciating these objections. They can best be explained by using a simple model of capitalism.

Figure 1.



For example, a business entity called Mining Company, Inc. wishes to enter into a business venture of mining ocean minerals. Investment capital is supplied by private investors through stock sales so that Mining Company, Inc. can develop the necessary technology, hire the

[10] *Id.*

needed manpower and purchase the required machinery to engage in a business venture. The mining business venture goes into operation with the technology, machinery and manpower of Mining Company, Inc. Profits from the mining venture are split among the shareholders (who supplied the venture capital) as a return on their investment. This gives investors further incentive to invest more money in either Mining Company, Inc. or another business and so the cycle repeats itself.

Examples of this cycle are prevalent in capitalistic societies. Sometimes the cycle includes a patent or patents as its foundation to attract capital.[11] Otherwise, a company's reputation for success attracts investors.

The technology transfer provisions of the Law of the Sea Treaty seek to break the cycle discussed above (in Figure 1) at the point between the company and the business venture by taking the proprietary technology out of the company's exclusive domain. Because the company will no longer maintain a competitive edge, investors will no longer be assured a return on their investment. When, due to a foreseeable bad return on investment, investors curtail their money flow, the company, which, as an entity, really *is* its investors, becomes powerless.

What does all this mean? Even though the United States is only one of over 150 nations involved in the Law of the Sea Treaty, much of the money and most of the technology to support mining of the seabed is expected to come from private American concerns.

In fact, only the few large industrial nations, including the United States, presently have the technology or capability to mine the seabed. It is interesting to note that most of the countries that have signed the convention do not possess and are not able to develop the necessary technology to mine the seabed.[12]

If American industry decides, or has it decided for them by its stockholders, that it will not invest in new technology to mine the seabed or that it will not ocean mine at all, what use is a ratified Law of the Sea Treaty?

Conrad G. Welling, manager of Ocean Mining for Lockheed Missiles and Space Company in a news article estimated that the next step toward ocean mining will cost $50-$100 million[13] for pilot operations to gain necessary experience. Following that, he estimates the need for

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[11] For example, Polaroid Corporation and Xerox Corporation.

[12] Borgese, The Law of the Sea, 248 SCIENTIFIC AMERICA, 42 (March 1983).

[13] 1976 U.S. Dollars.

$300-$500 million[14] for further, or advanced pilot operations.[15] Each mining site will eventually require a capital outlay of 1.5-1.8 billion dollars.[16] Welling also stated in a September 1976 article in the Mining Conference Journal, that the problem with ocean mining is not technology, but rather attracting the necessary investment capital.

What would be the result if the United States agreed to ratify the Law of the Sea Treaty with its present technology transfer provisions? The Treaty would become the "supreme law of the land,"[17] supplanting the existing U.S. deepsea mining legislation. Any U.S. citizen operating under the jurisdiction of the Treaty would have to act in accordance with the Treaty's mandatory requirements. Thus a U.S. company would be forced to choose between curtailing mining operations or unrestrictively disclosing its technology to the Enterprise in exchange for a mining permit with ephemeral "substantial commercial value." This taking of property rights with governmental acceptance would be, absent just compensation, in direct conflict with the U.S. Constitution.[18]

If the United States signed the LOS Treaty the government would be forcing private companies to divulge their most guarded asset — technology and engineering know-how — for money earned through their mining efforts or through a compulsive license which would probably ineffectively compensate them. This compares to the situation without the Treaty, where the mining companies would receive the same profits while maintaining the exclusive rights to the technology. Such forced transfer of technology under the Treaty with the apparent approval of the U.S. government constitutes a governmental "taking" requiring just compensation. However, it may be argued that, because the mining companies received mining permits as consideration for their technological know-how, no "taking" has occurred. Ultimately, the constitutional answer hinges upon Congress' balancing of the companies' desire to keep their trade-secrets confidential from public disclosure against the public interest in protecting the strategic supply of minerals.

In whatever manner the U.S. government acts, warns Harry J. Gray, chairman of United Technologies, the mineral situation is simi-

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[14] *Id.*

[15] Mining Conference Journal, Sept. 1976.

[16] The Washington Post, July 18, 1982 at L1.

[17] U.S. Constitution, Article VI.

[18] For a further discussion see: Silverstein, Proprietary Protection for Deepsea Mining Technology in return for Technology Transfer: New Approach to the Seabeds Controversy, 60 J.P.O.S. 135, 140 (March 1978).

lar to that of our foreign oil dependency. "Without an intelligent national minerals policy now, [the United States] will become increasingly vulnerable."[19] The United States presently imports 98% of its manganese, 97% of its cobalt, 93% of its aluminum, 91% of its chromium and 51% of its tin, nickel, zinc and tungsten. Many of these minerals come from politically uncertain African nations and the Soviet Union.[20]

The oceans bordering the United States contain vast quantities of much needed minerals that can reduce dependency on foreign sources.[21] At some future time with the Treaty in effect, private companies might be forced to proffer their technology. This scenario may be compelled by two conditions. First, a matter of national security might arise forcing the U.S. and its companies to mine the international seabeds without the U.S. first signing the Treaty. In such a case the U.S. government could compel an exchange of the technology from a U.S. mining company in return for just compensation. This scenario represents an unlikely last ditch effort and it can be assumed that in one way or another American mining companies will be mining the seabed for their own commercial interests long before the mineral situation becomes nationally critical.

The second possible condition would be a result of the Treaty becoming a part of the body of international law. Certain provisions of the Treaty are already being treated by those knowledgeable as existing "customary" international law.[22] Once the deep-sea mining provisions are held to be incorporated in the international law, the United States will be bound by the Treaty provisions without having formally adopted them. Free exploration of the seabed by U.S. citizens could then be blocked by concerted action of States or by legal means in the International Court of Justice.

There does not seem to be a solution to ocean mining for private American concerns or the United States government.[23] The problem is circuitous: there are vast amounts of money to be made mining ocean minerals; private American concerns will want to capitalize on the opportunity; the United States government cannot sign a treaty that violates (on its face) its own Constitution.

It is interesting to note that in a computerized comparative study of

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[19] Time, July 21, 1980, "Strategic Metals, Critical Choices."

[20] *Id.*

[21] *Id.*

[22] See 69 A.B.A.J. 156 (1983).

[23] The effectuation of mini-treaties has been and is presently being considered as alternative solutions.

national constitutions,[24] 118 out of 142 constitutions give their respective citizens the right to own property, and many, if not most, require that property cannot be expropriated without just compensation.[25] Only 4 countries (U.S., Israel, Venezuela and Turkey) voted against the final *draft* of the Law of the Sea Treaty in the Conference and of those, only the United States objected to the technology transfer issue,[26] presumably because, as previously noted, much of the ocean mining technology is presently owned by private American concerns. Those countries voting for the Treaty would naturally not be as worried about giving away something they neither presently possess nor believe they will possess in the near future.

So far, this article has only highlighted problems with the mandatory technology transfer provisions in the L.O.S. Treaty without discussing any possible solutions under consideration. There are presently many schemes being used to protect intellectual property (patents, know-how and trade secrets) in international dealings. International judicial tribunals, local law remedies, contractual agreements to arbitrate future disputes and international investment guarantees[27] are but a few.[28] Rather than implementing the present technology transfer provisions, one of these existing alternate methods of protection can be contractually agreed to either on an ad hoc basis during the

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[24] H. van Maarseveen & G. van der Tang, Written Constitutions — A Computerized Comparative Study, at 114 (1978).

[25] R.N. Spann, Constitutionalism in Asia, at 19 (1963). See also 10 Journal of World Trade Law 421 (1976).

[26] *Israel* voted against the treaty because of the reference to the Palestine Liberation Organization under the category of national liberation movements and that the PLO will have status to sign the treaty and receive profits from the "Enterprise's" sea bed mining. Israel does not believe there is any connection between the Law of the Sea Treaty and national liberation movements. *Turkey* voted against the treaty because they were unhappy with certain provisions concerning delimitation of the continental shelf and provisions concerning islands. *Venezuela* voted against the treaty because they were unhappy with provisions concerning delimitation of neighboring countries' territories.

When the Treaty was opened for signature on December 10, 1982, 117 States and two other entities signed the Convention. Whereas, 140 States and nine other entities signed the Final Act of the United Nations Conference on the Law of the Sea. Belgium, Italy, Luxembourg, Federal Republic of Germany and the United Kingdom, were among those States signing the Final Act, but refusing to sign the Convention. The United States and Israel refused to sign either the Act or the Convention.

[27] See the Draft Articles of Agreement of the International Investment Insurance Agency of the International Bank for Reconstruction and Development (World Bank Group).

[28] 10 Journal of World Trade Law 421-433 (1976). Some of these protections even originated in the United Nations.

negotiation of each technology license, or by further legislation or regulation in the Law of the Sea Treaty.

Many national governments have provided local remedies by enacting statutes which give protections to foreign investments under the jurisdiction of the respective states. An example of one such local remedy is Article 32 of the Korean Foreign Investment Encouragement Law of 1960 which states in part that:

> 1. The assets of registered enterprises under this law shall not be subject to any compulsory expropriation... except appropriation by the government for a public purpose.
>
> 2. In the event of the expropriation of the assets... just compensation shall be paid in accordance with law. Such compensation shall be in an effectively realizable form and shall represent the full equivalent of the property taken.
>
> 3. The investor shall have the right to remit abroad without delay any sums of money received as payment for action taken under this article free of taxes or fiscal charges.[29]

Another method of protection, which consists of using international judicial tribunals, requires that the remedies available in a country's internal courts or administrative agencies must first be exhausted. "Access to international judicial tribunals is available only to nation-states or recognized international organizations". Licensors would therefore be required to inspire/urge their government to press their claim.[30]

It has been suggested that "the best forum for the assertion of... international legal rights of a licensor is before a permanent or ad hoc arbitration tribunal."[31] Such organizations and ad hoc arbitration procedures are presently available to private parties: "for example, the International Centre for the Settlement of Investment Disputes (ICSID), The International Chamber of Commerce, and the American Arbitration Association... "[32]

The Convention on the Law of the Sea does establish certain tribunals to resolve disputes. Specifically Part XI, Articles 186 to 191 creates a "Sea-Bed Disputes Chamber of the International Tribunal for the Law of the Sea". Under certain conditions given in Article 188, disputes between States may be submitted to either a special chamber of the International Tribunal for the Law of the Sea or to an *ad hoc* chamber of the Sea-Bed Disputes Chamber. Disputes concerning the

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[29] *Id.* at 424 n. 13.

[30] *Id.* at 425.

[31] *Id.* at 426.

[32] *Id.* at 426, n. 26.

contract interpretation or application may be referred to binding commercial arbitration.

International Investment Guarantees represent an exciting form of assuring an investor that his technology will not be misappropriated. These Guarantees work similarly to collision insurance on a car: a premium is paid based on the value of the technology just as one is paid based on the value of the car. Although presently unavailable, International Investment Guarantees is a scheme that is being considered.[33]

Technology transfer was not an issue until the United States strongly objected to those provisions after President Reagan took office. One wonders whether the technology transfer draft provisions are a product of ignorance, indifference or design. No matter the reason, it is necessary to educate all nations on the inter-relationship between technology, investment incentive and investment capital (see Figure 1). There was no sound reason to force technology transfer in the L.O.S. Treaty. Provisions allowing arms-length negotiations with clauses to enforce fair competition and hinder misappropriation to know-how foster technological advancement in the long run. Although mandatory technology transfer provisions are being considered for the Treaty as part of an international social welfare program to stimulate competition from the third world, a major part of the world, i.e. the United States, is not yet philosophically ready to contribute. The best climate for investing, which will settle the nerves of wary investors and heighten the social benefit to all, remains one where both sides believe they have an equitable agreement.

In conclusion, the United States had no choice but to vote against the Law of the Sea Treaty because of the mandatory technology transfer provisions and other provisions considered to be adverse to American interests. Participating nation-states cannot expect the United States to enter into an agreement which arguably violates its own Constitution. If the United States would continue to negotiate the Treaty by educating the conference on the shortcomings of the technology transfer provisions and the usefulness of pre-existing know-how protection schemes, there is a possibility that the L.O.S. Treaty could be modified to the satisfaction and benefit of all the member countries. However, if the United States remains isolated from further developments of the Convention, the consequences may leave U.S. mining interests without a defensible position.

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[33] Note 27, *supra*.

PHILANTHROPY IN THE BASIC SCIENCES*

EDWIN C. WHITEHEAD**

The title of my talk is Philanthropy in the Basic Sciences. I'm inclined to use as an aternative title: "How Hard It Is To Give Away One Hundred Million Dollars," or, "It's Easier To Make It Than Give It Away."

I am hardly an authority on Philanthrophy in the Basic Sciences, as I have only had a single experience. One might think, from the title that I would provide a philosophic dissertation on the subject; however, I am afraid that I am not a great philosopher. Perhaps, if I were, I would be less of a philanthropist.

Let me try to describe my single experience:

Together with my father, I founded a company called Technicon in 1939. Thirty years later, in 1969, I owned 100% of Technicon and went public by selling approximately 5% of the company, or 1 million shares at $42 a share. Quite suddenly, I realized, or perhaps more importantly, my advisors realized, that I might have a very sizable fortune, at least on paper. At this point in time, one starts to make long range plans concerning one's estate.

Certainly, one starts to think of philanthropy as opposed to purely business interests. The philanthropy that most closely represented my interests was the founding of a medical research institute.

This would have two advantages:

1. A substantial portion of the Technicon stock, probably a majority, would be owned by the research institute.
2. It seemed appropriate since my success had been built on advances in medical technology, that the proceeds be utilized to further such advances.

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*Paper delivered before The Association of the Bar of the City of New York, April 21, 1982.

**Founder, Whitehead Institute for Biomedical Research.

Let me deviate for a moment here with an ironic observation: Today we hear considerable concern of industry controlling academia. Here, we would have had a case of academia literally owning and controlling a corporation!

Back to the story.

In 1971, we started to form an Institute.

After many false starts, lots of problems, and what turned out to be quite a learning experience for me, we finally have established an Institute which you might know as the Whitehead Institute for Biomedical Research at M.I.T.

I mentioned before that there were two important factors in my decision to form such an Institute:

A. The sentimental and emotional attachment I felt towards putting the funds back into medical research, and

B. Keep the ownership and control of Technicon in a single entity upon my death.

I must tell you that A has overwhelmed B as a basic motivation.

In 1980, when Technicon merged into Revlon, the control issue no longer was relevant. Happily, this merger provided the requisite dividend stream to facilitate the funding of the Institute.

Thus, what started out as a philanthropic sideline activity, rapidly turned into the most important aspect of my life.

Along the checkered path of planning and developing such an Institute, we were extremely fortunate to have recruited David Baltimore as our founding director. David is a relatively young (44 years old) Nobel Laureate in molecular biology, with a specialty in genetics. Equally, or more important, he is a very broad gauged individual who has been widely identified as a statesman of science. We were faced with three fundamental problems in establishing a research institute, which briefly can be described as:

What, Who, and Where?

What will be the program? Who will carry it out? And, where will it be done?

With the appointment of David, the what and who were pretty well decided. His interests, and parenthetically, mine, lie in the general area of molecular biology with an emphasis on cell development.

The broad field of cell development can be defined as covering everything from the way a sperm and egg get together to the differentiation of cells into the myriad types that make up the human body. Along the way, one possibly (and hopefully) might pick up information as to how a cell becomes diseased, as illustrated in the most dramatic way, by cancer. The What and the Who of the What, Who, and Where were obviously answered by David and his interests.

That left the question of where.

David, being a professor at M.I.T., quite naturally had an affinity for that institution, and we opened discussions with the M.I.T. administration. It was at this point I was given a basic lesson in academia.

I had always visualized the character of the affiliation of our Institute with a university as a rather loose relationship.

In other words, I envisioned an "Affiliation" that could be defined as, "Attached to," rather than "Part of." This difference is more than subtle.

When one is "Attached To" a university, one's staff generally would have titles such as "Visiting Professor," "Associate Professor," and "Adjunct Professor," etc. When one is "Part Of," the titles change to just plain "Professor." The implication here is that when one is "Part Of," the Institute professors have all the rights and privileges of the university, including tenure, that the university professors have.

The sticker here is that from the very beginning we had decided that our Institute must be independent in its choice of personnel and program. Thus, in effect, we were perceived by some of the M.I.T. faculty as what might be termed, "a foreign body" into the very heart of the university. Perhaps, "foreign body" is somewhat exaggerated, but it certainly contains more than a germ of truth. Perhaps this explanation will help you to understand the considerable controversy that our interests created at M.I.T.

Not unnaturally, some of the faculty felt threatened by our "invasion."

The rough terms of the deal that we worked out with M.I.T. were:

1. $7.5 million would be provided to M.I.T. principally for the Department of Biology and related departments. In return, two professorships would carry the Whitehead Institute name.
2. The Board of Directors of the Institute is completely independent of M.I.T. and has sole discretion over personnel and program with the exception that the Institute will accept three members to the Board from M.I.T., subject to the approval of the Institute Board.
3. M.I.T. will accept up to twenty joint faculty appointments. Such appointments will be proposed by the Whitehead Institute, subject to approval by M.I.T. and will be fully paid for by the Institute.
4. The Director will have to become a member of the M.I.T. faculty. This effectively gives M.I.T. a degree of control

since the appointment of a Director will have to be accepted by M.I.T.

5. The only other issue of substance was patent policy.

In the event of any patentable discoveries by Whitehead Institute scientists, remuneration for such patents will be split 50/50 between M.I.T. and the Institute after payment of all expenses. The patent issue got to be a rather difficult one. Traditionally, M.I.T. has had a history of non-exclusive licensing of patents, forced by a desire to keep discovery in the public domaine.

Our group has an equally strong feeling that for maximum exploitation of patents, and therefore, maximum public benefit, exclusive licenses most often are necesssary.

I believe that the M.I.T. view has changed somewhat over the years more toward our way of thinking, but certainly there is still strong feeling on the part of some of the faculty against the patenting system and exclusive licenses for exploitation. The debate at M.I.T. carried on for more than six months.

A very vocal minority of the faculty petitioned and spoke out against the affiliation.

The administration of M.I.T. did not take a public position, or even a private one, with the faculty in any way, until the end of the debate. Interestingly, at the final faculty meeting in December of last year, the faculty voted overwhelmingly, about eight to one, in favor of the affiliation.

The M.I.T. Corporation then voted almost unanimously to form the affiliation.

Recently, a reporter asked my whether I would do it all over again.

My answer was an unequivocal, "Yes."

Certainly, I got very tired of being misquoted by the press, of having my motives questioned, and of the enormous amount of confusion that our adventure engendered.

However, In retrospect, it was handled beautifully.

There was full and open debate.

Every aspect of the affiliation was thoroughly aired.

As David Baltimore reflected on the night of our faculty victory, "Democracy is a wonderful thing . . . if you win!"

A victory such as we had after such a public airing is far more conclusive than a deal negotiated in privacy between a university administration and ourselves.

The union is now perceived on the M.I.T. campus as a total one, and not something negotiated in secrecy by the administration. This, of

course, is terribly important. A moment ago, I used the word "confusion" engendered by our adventure.

At about the same time we were negotiating with M.I.T., the Hoechst company was doing the same at Massachusetts General Hospital. Unfortunately, they both hit the press at the same time, and the press, some M.I.T. faculty, and the public had difficulty in understanding the differences between the two activities.

The one major difference is that Hoechst as an industrial concern is paying for research at Massachusetts General. The results of such research are available to the Hoechst company to exploit for profit.

Our Institute, on the other hand is a purely philanthropic entity. In the unlikely event that profit making opportunities arise, any profits derived will go back to the Institute — and not to the donor.

Some M.I.T. faculty members were concerned that somehow our endeavors really masked a vehicle to make a profit for myself, Revlon, or other of my business interests.

The press, public, and even some of the M.I.T. faculty had considerable difficulty in understanding this differentiation.

I believe that even today, some people suspect my motives and are sure there is a hidden agenda somewhere to turn the activities of the Institute to my personal profit. As a good friend and Institute Board member recently suggested to me, "A commitment to give away $100 million is a poor start to making profits." I believe our type of Institute will probably not replicate itself too often in the future. I say this probably from the feeling that there are not too many people either able or willing to donate sums of this magnitude for purely philanthropic causes. If such people do come forth, it is unlikely they will follow the Whitehead Institute example. It would be far easier to set up a foundation to provide funds for worthy causes or alternatively, make a gift directly to an existing university to set up an Institute.

In fact, some of the members of the Board of Governors at M.I.T. still do not understand why "We did not just make a gift to M.I.T."

Undoubtedly, if I did not have the background I do, I would certainly have opted for the foundation or the gift to the university route. It is far less risky, involves considerably less personal publicity, and one retains a continuing position of power.

Against this, I have the very strong feeling that by setting up a separate research institute, we can have a more profound effect on society. Undoubtedly, in the future, the Hoechst model will be more generally seen as a source of university funding than the philanthropic approach. To my mind, there is a real problem with this model.

Having spent my life in industry, and particularly one with a heavy commitment to research and development, I can appreciate funda-

mental differences between an academic laboratory and an industrial one.

In the past, university laboratories have been far more elitist than those of industry.

The reason, I believe, is simple. University laboratories are essentially "open." As soon as a discovery is made, it is broadcast overtly.

In theory, and often in practice, research is open to other scientists even before publication.

Industrial research is quite another kettle of fish. We, in industry, go to great lengths to preserve secrecy in research. I believe this is quite natural, because the economic opportunities created by research can be destroyed quickly by early disclosure.

What then, will the future hold?

On the one hand, we have the prospect of corporation funding (and owning) research laboratories in universities.

On the other, we have outstanding research scientists under contract to commercial companies, and, on the third hand, we have the tradition in academia of open laboratories.

Obviously, this poses potential conflict.

Both government and philanthropic funds are not keeping pace with increased needs. Corporations fill the gap, but how can a corporation fund a laboratory if that laboratory's chief scientists already have competitive commercial interests?

Today, it is almost the rule for outstanding university scientists to have contracts with commercial companies — at least in the genetic engineering field. Certainly, no firm will fund a laboratory if the discoveries of such a laboratory can end up in the hands of competitors. If we depend on corporate investment, will we transform our great fundamental research laboratories to those with product orientation? It is certainly unreasonable to expect a corporation to fund research that does not result in a product or a proprietary process.

Thus, we look at the alternatives:

1. Philanthropy (private and corporate).
2. Corporate investment.
3. Shrinkage of the research effort.
4. Government funding.

I think we can realistically agree that philanthropy is insufficient. The corporate investment is fraught with danger to the system. Shrinkage appears unthinkable at a time when the needs are proliferating. This, then, leaves us with government support. But how can govern-

ment continue to support universities at a time when the citizenry is already overburdened with taxes?

I have a suggestion to make here.

I believe that if legislation could be enacted to allow a *small* percentage of corporate earnings (1 or 2%) to be provided to universities (and, perhaps, to other good causes) in lieu of taxes, a great stream of support for the universities would be unleashed.

If tax credits were allowed, as opposed to current tax policy of allowing only deductions for charitable or business-related projects, we would greatly encourage corporate philanthropy.

Ironically, today a corporate investment for profit has identical tax treatment as a corporate philanthropic donation.

Thus, if corporations were allowed a direct tax credit for monies directed toward philanthropic causes, I believe most corporations would opt to make such donations. At present there is no incentive for corporate donations. Tax treatment for money spent for advertising, research and development, and yes, even plant improvement, are treated in the same way as donations for tax purposes. What businessman can justify donating the company's money as opposed to spending it to improve his business?

Under "the donation in lieu of taxes" plan, the business of business would not be affected, yet the universities would benefit enormously.

I believe this plan would have far reaching societal benefits. After all, one of the things that makes this country great is the system and tradition of private philanthropy.

In the final analysis, the government would not be the loser, as it is always government that makes up the deficits of the private sector. Certainly, the ultimate beneficiaries would be the nation and the world who would reap the benefit of tremendous increase in the overall research and development effort.

I started this talk with the statement that I am not a philosopher, but rather a pragmatist. I apologize for the philosophic nature of some of these remarks, but I do believe that we are faced with difficult choices to seemingly insoluble problems and I feel constrained to put forth one man's point of view.

MANAGEABLE CONTRACTUAL RELATIONSHIPS*

WILLIAM H. GRIESAR**

In spite of the recent interest and concern about the flow of private (primarily corporate) capital to our universities for the support of research, I think that there is nothing really new about this kind of sponsorship. It has a long, honorable and successful history in the physical sciences although interest in the process has taken on a new intensity, primarily as the result of several recent highly publicized investments or grants in basic biomedical research, such as the Monsanto contract at Harvard University, the establishment of The Whitehead Institute at MIT and the extraordinary funding arrangement by the German pharmaceutical giant, Hoechst AG, establishing a Department of Molecular Biology at Massachusetts General Hospital in Boston. There are many, many smaller funding arrangements which in the aggregate are probably far more significant.

While the Federal Government still is the clear leader in the funding of basic research in the life sciences in this country, private sponsorship is moving up.

The reasons for the shift now appear to be the same as those that caused private sector sponsorship periodically to accelerate in the past. The technical skill and learning is in the universities at the moment rather than in private industry. In the past, the subject might have been atomic fission; today the talk is of genetic engineering. Industry is going back to school to learn new techniques in the life sciences. In addition to this attraction, cutbacks in federal spending have put added pressure on the academic world to accommodate the needs of alternate funding sources. Thus, on both sides of the issue there is renewed interest in ways to develop manageable contractual relationships between industry and academia.

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*Paper delivered before The Association of the Bar of the City of New York, April 21, 1982.

**Member, New York Bar.

An argument can be made that we should be concerned as a society whenever too much money from a single source is given to our universities. The idioms of life by which business survives — goal orientation, competition, secrecy, and product development — are arguably incompatible with the essential nature of a university's purpose and mode of existence. Industry and academia represent, if you will, totally different cultures, and it is fair inquiry to question if there is common ground on which they can exist together comfortably. I believe there is.

I think that arguments against such arrangements overstate their case. Private capital does not have to represent the threat of a single source of funds. On the contrary, it is an alternative to government monopoly of research, and as such actually may be a more flexible tool for the support of research.

A number of specific questions, concerns, if you will, have been raised in Congress about private funding of basic research at our universities. Congressman Albert Gore, Jr., the Chairman of the Subcommittee on Investigations and Oversight of the House Committee on Science and Technology, has identified several of these concerns which I would like to briefly note:

First concern: Congress must have someplace neutral to go for advice on the profound issues raised by biotechnology research, and the universities and research institutions of this country have traditionally filled that role. Will agreements such as the one between Hoechst and Massachusetts General Hospital, Monsanto and Harvard (or Monsanto and The Rockefeller University), Exxon and MIT, or Celanese Corporation and Yale University, now compromise that neutrality?

If the government is concerned about a univesity's neutrality on a particular issue because it has entered into a funding arrangement with a private sponsor, the government may find its desired neutrality at another university. There is no paucity of academic institutions in this country and no private sponsor is prepared to fund them all.

Second concern: Private sponsors will come into the universities and steal the cream of the research heretofore funded with taxpayers' money.

This concern was raised by Congressman Gore in connection with the Hoechst — Massachusetts General Hospital Agreement, in particular, I think, because Hoechst was a foreign corporation and biomedical research has been the subject of a fair amount of U.S. Government support. The issue therefore had added bite in that instance because it could be argued that technology developed with United States tax dollars might be exported abroad. The argument has

relevance to domestic sponsors as well, in that arguably they can get a fantastic return on their research dollar because they will have access to a wealth of accumulated knowledge in our universities.

I fail to see merit to these arguments, however.

A sponsor coming into a university may avail himself of the sum of the knowledge available at that university at that time, it is true, but he does not necessarily and probably will not be entitled to the use of patented inventions discovered prior to the time of his sponsorship or at least not without a license. The patent system, it seems to me, is a long-standing and very workable solution to this concern, and one about which you may hear more later on. The point, however, that one should be barred at the university door because he may acquire knowledge there, seems to me patently excessive.

Third concern: The possibility exists that business/university arrangements will put an undue strain on the internal operations of universities themselves.

Here, I think, we have a legitimate concern and one which may have to be resolved in different ways with respect to each contract or arrangement that is negotiated. But again, I do not see why carefully crafted arrangements between the business sponsor and the university, each mindful of their roles and their goals, cannot address all of these issues satisfactorily. There is plenty of room for mutually valuable agreements to be made, it seems to me. I will return to a discussion of a few of the issues that can arise in the negotiation of such arrangements, and how one might consider and resolve them in a manageable way, in a few moments. But first, and quickly, I wanted to just mention Congressman Gore's last concern.

Fourth concern: He suggested that the new vigor of relationships between private industry and universities could lead to an erosion of public trust in science if every new discovery involves some form of public relations hype.

I am not aware that this has been a problem in the past. On the contrary, it seems to me that the natural skepticism of good, independent scientists, free of direct corporate control, might actually have a sobering effect on what business will say about particular discoveries.

Now, to get back to the topic — manageable contractual relationships. You have already had a description of two admirable projects, Exxon's at MIT, and the Whitehead Institute, also at MIT. Boston, it occurs to me, may have a peculiarly suitable climate for industry — academic arrangements, for the contract which I am associated with — Hoechst's funding of a Department of Molecular Biology at Massachusetts General Hospital was also created in Boston.

The Hoechst-MGH arrangement is a classic example of one of the more significant business-academia arrangements which, by virtue of its sheer magnitude, creates additional issues which have to be addressed. That is to say, it involves very large-scale funding — something in excess of 60 million dollars payable partly for capital improvements to house a new Department of Molecular Biology and the rest to pay for operating expenses over a ten-year period. What does such a sponsor get for its money? It gets knowledge, an education — the product, if you will, that academia understands best. It gets a window onto science and it gets a license.

The metaphor of the window onto science is worth stressing for, in my judgment, manageable contractual relationships begin when the parties come together to take advantage of their traditional roles. It may be a teacher-student relationship that is created, ultimately maturing into a joint collaboration arrangement, but in all events, it is a relationship that recognizes the traditional role and function of academia as the creator and dispenser of knowledge. It is not an arrangement that attempts to reshape one's traditional view of one's role — such as trying to make Harvard University into a joint venturer, or a mutual fund. That's where real problems begin, I believe.

Let's consider some of the kinds of issues that can arise in formulating arrangements of this kind.

1. *Exclusive Funding*

Some institutions might find exclusive funding too restrictive and yet a major sponsor will genuinely feel that it should not have to share the fruits of the efforts it supports with anyone else. From the university's point of view, however, tying itself to an exclusive funding source, even in only a strictly defined area, may simply not be acceptable. If nothing more, it may create an image problem for the university, but it is likely to pose other problems as well.

Certainly exclusivity of funding was a matter of some discussion in the Hoechst-MGH arrangement. On the one hand, the extraordinary level of support in that arrangement made it less likely that the MGH will need to seek support from other sources. On the other hand, the rather broadly defined subject matter of that contract, research in the area of molecular biology, could well lead in so many diverse directions, that no single sponsor could ever cover them all. The solution arrived at was this. The arrangement does not prevent the MGH from alternate funding sources in the final analysis. Hoechst does not have the absolute right to remain the exclusive sponsor, but simply has a right of first refusal and the MGH retains the right to seek alternate funding sources where Hoechst declines support in a particular area.

This seemed a workable solution to what at the moment is only a theoretical problem.

It is quite possible, however, that regardless of the level of support or the defined scope or subject matter of the contract, some universities will refuse to accept exclusive funding, simply as a matter of principle. In my judgment, however, both the level of support and the scope of the contract itself, should influence the application of such a principle.

2. *Exclusive License*

Aside from exclusivity of funding, large-scale sponsorship at universities raises another issue about exclusions that has to be considered — the exclusive license. The question involves the dedication by a public or quasi-public institution of the fruits of its research to a single sponsor for perhaps the full life of the patents. The obvious concern is how can a university justify the granting of an exclusive license to a single corporate sponsor rather than, say, a proliferation of non-exclusive licenses. Wouldn't the exclusive license route better ensure that the new drug or other discovery gets to patients as quickly as possible? This issue, I suspect, is more apparent than real. A corporate sponsor is not providing research money to a hospital or university so that it can obtain an exclusive license to keep a new drug off the market. If it is a drug good enough for the sponsor's standards and purposes, the sponsor will probably market the drug itself, just as quickly as rationality and the Food & Drug Administration will allow it to do so. If it's not good for the sponsor's standards and purposes, then it will license someone else to manufacture it. One way or another, a commercially viable and useful product will get into the marketplace with all due speed.

Nevertheless, if the university or hospital has a lingering concern about a sponsor's intention to allow all new drugs into the marketplace, it can probably negotiate some ultimate protection, that would make an exclusive license erode into a non-exclusive one if the drug were not marketed with appropriate haste.

3. *Research Direction*

Universities and university scientists may resist outside control over research direction, even from the sponsor paying the bills. Here, too, however, the subject matter of the contract arrangement and the level of support will undoubtedly be influencing factors.

The problem was not so difficult in the Hoechst-MGH instance because the contract scope is broad, and basic research is primarily involved, not developmental research.

The more mission-oriented the research desired, i.e. the more it approaches developmental as opposed to basic research, the more diffi-

cult the problem can become, I think, but even here, the problem may be more theoretical than practical.

If the sponsor is itself a large pharmaceutical house, with a sophisticated research staff, the problem of research direction may be less significant, as the two staffs work hand in hand.

The Exxon contract with MIT handles the problem neatly and arithmetically having, I understand, 80% of the funding used on projects mutually agreed upon, and 20% available for use on projects of MIT's professor's choosing. No one, to my knowledge, has suggested that this is an encroachment on academic freedom.

4. *Publication vs. Patent Protection*

The business sponsor wants patent protection and the university scientist wants career recognition in the form of publication. There is a way to accommodate these seemingly conflicting needs. If, before the scientist published his discovery (which the scientist is admittedly anxious to do), he gave the sponsor an opportunity to review the publication so that he could see what is involved and apply for a patent if justified (which the sponsor is admittedly anxious to do), the needs of both sides could be served without risking patent loss or impinging on academic freedom. The submission of manuscripts to the sponsor is not censorship. No one is suggesting that the scientist cannot publish what he or she wants, only that the sponsor have a first chance to get a patent application filed. The technique is simply to create an obligation to submit manuscripts in advance and, as a corollary to that, to make it contractually impossible to prevent publication.

How long a lead time should there be? Here you may have a tug of war. The scientist does not want to delay — someone else may win the race to the publisher. The sponsor needs time to absorb the material, review it for possible proprietary disclosures and prepare a patent application where advisable.

Much may depend upon the sophistication of the parties, how closely they work together, how complicated the discovery is, and how close someone else may be to publication. But remember, if someone else is close to publication, the sponsor reviewing the manuscript would be well advised not to take too long, either, because someone else's publication can destroy patentability too.

5. *Collaboration*

The business sponsor may ask that research it supports be kept as confidential as possible.

Universities do not usually work that way, however, and if we are talking about some fairly basic research in a significant area such as genetic engineering, this may present something of a problem to the

usual operating style of a university and its laboratories or at least what we would like to think should be that operating style. The problem is not just limited to funding arrangments with the private sector, however. Government funding can involve the same kinds of problems of accommodating the academic culture with the funding source culture. For instance, in a recent *N.Y. Times* report[1] it was noted that "Intensive efforts are being made here to reach a compromise under which American technical and scientific data that are unclassified but of potential military and industrial value can be kept from the Soviet Union and other foreign nations without destroying freedom of communication in scientific research." The article goes on to say that "No early resolution is expected because the issue poses a difficult problem. On the one hand, Government officials say that American science is so open that there is substantial 'leakage' of ideas to Soviet visitors. On the other, scientists say it is the very openness of American academic life, in which research and teaching are closely integrated, that underlies the scientific edge this country enjoys over the Soviet Union in most fields of study."

There will be no single best way to deal with this problem. There is genuine merit and need on both sides of the argument, I think and a great deal may depend on the facts of your particular situation. If your contract is relatively small, or in a narrow, defined area, total secrecy may present no problem for either side in individual cases for the short term. The subject matter may be too small to even require collaboration. Other subjects are not of that nature, however. Molecular biology, for instance, is clearly a matter of interdisciplinary research.

What then can you do? You can start by reviewing the existing landscape, seeing what are the present natural collaborative lines and what is the basis for support behind them. You should certainly review the policy of the institution involved on consulting arrangements, and see what consulting arrangements the scientists you will be using have and with whom. You may find, from your review, that all is satisfactory or you may wish to negotiate changes. There are a number of ways this might be done, but I think that is detail beyond the scope of this particular overview.

6. *Peer Review*

There is one problem I never would have thought existed until I began working with scientists on private funding arrangements. The private arrangement, I firmly believed, offered the totally positive advantage of freeing the scientist from the drudgery of preparing annual

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[1] *The New York Times,* February 1, 1982, page 10.

government grant applications. Grant writing is the bane of the scientist's existence, I thought, with no redeeming qualities whatsoever. Apparently this is not quite the case. Indeed, it is partially true, and if you can offer a scientist a funding arrangement that will free him from that chore for a few years, he will be most grateful. But he will lose something in the process which may be more valuable than either of you thought, and some consideration should be given to developing an alternative mechanism to replace that loss.

Applying for government grants on an annual basis is itself a discipline that many scientists find exceedingly valuable in that it is their one opportunity, periodically, to gain a little perspective on their work and a sense, from another professional source of whether their research is going in the right direction or not. The grant writing process is not without its give and take and the feedback to the scientist can be useful and stimulating and a push in the right direction. Or at least, that is what I have been told by working research scientists. Drudgery it is, but useful drudgery it may be, and if you eliminate its need, some laboratories may flounder.

Collaborations can help here. If the sponsor is a drug company with its own laboratory, collaboration with that laboratory may be all that is needed. The mechanism of a scientific advisory board is another useful tool — not to dictate research direction necessarily but to provide a greater perspective for the workbench scientist who wants and needs his work judged.

7. *Termination of Funding*

Another issue that both university and faculty are likely to raise involves planning for continuing funding after the original sponsor's commitment runs out. Here is an area where arrangements with private sponsors can be so much more flexible than government funding which is almost invariably on an annual basis. In Exxon's arrangement with MIT, for instance, either party must give the other two years' written notice to terminate the agreement, thus giving some warning and a chance for future planning before the existing funding runs out. The Hoechst-MGH Agreement contains a similar mechanism.

8. *Secret Sponsorship*

Industrial sponsors might be tempted to suggest a secret funding arrangement. That is to say, they are willing to be sponsors, but want to do so anonymously. They may have perfectly valid reasons for doing so. Why alert their competition unnecessarily as to their research and development plans. Perhaps the competition might use it as an excuse to attempt to lure away some of their in-house research talent.

For whatever the reason, an anonymous sponsorship of a major funding effort at a university, unless it is an out and out grant, is not likely to be a very successful beginning, even in those instances where a university would be willing to agree to it. And I suspect that few universities would be willing to agree to enter into a major research project involving technology transfer where it was not free to disclose the name of the sponsor and the purpose of the research arrangement. Disclosure of contractual details is another matter, of course, and these can usually be kept private, although often there may be extensive pressure from faculty, students, the press and the government to make the full details of significant research associations between a university and a private sponsor public. Still, disclosure of contractual details, I think, is more a matter of taste than of necessity.

9. *The Researcher's Role in Negotiations*

The Harvard contract with Monsanto was heavily criticized because it was negotiated in secret. That is to say, it was not publicized that a contract was under negotiation until those negotiations were substantially completed. As a practical matter, that was probably the wisest course, since a public debate about a yet uncompleted contract can often have a very injurious affect upon the negotiations and, indeed, can make the likelihood of successfully completing negotiations just about impossible. Nevertheless, in my judgment faculty should be consulted and brought in at an early stage.

There is no question that by inviting the faculty (or more likely and properly, I think, a representative member or members) you will complicate the negotiations. Anytime you introduce a third party to the negotiations, you are introducing complexity and slowing down the whole process. Furthermore, and this is a peculiarly personal reaction, the precision and accuracy of the research scientist may not mesh well with the sometimes broader idiom of the world of negotiation. Nevertheless, failure to bring in the researcher may also produce a good deal of tension and suspicion later on.

10. *What the Sponsor Will Be Asked to Fund*

It would seem elementary that private sponsors of a research effort at a university should, regardless of the size of the project, bear the full costs of the services they are contracting to acquire. That is to say, the direct costs of the laboratory efforts involved plus some reasonable allocation for administrative overhead. Where the sponsor does not want to influence the direction of research or the operation of the university in any way, it might argue that it should not have to bear all of the costs because the costs would be incurred without the sponsor. They are not costs incurred solely because the sponsor wanted

them to be incurred. The problem with such a position, however, is that where the sponsor wishes to have a license with respect to any inventions coming out of such partially supported laboratory work, it will find it difficult not to provide total support. One answer might be to settle for only a nonexclusive license. It will be very difficult, however, to obtain an exclusive license for inventions arising out of research which the sponsor only partially supported.

From the university's side, it might argue that it is entitled to a bit more than full support from a sponsor hoping for an exclusive license. That is to say, since the sponsor has come to the university in order to avail itself of the science as it exists in the university environment, that sponsor ought to pay a little extra to help support the context in which its research will be conducted. Thus the sponsor may be asked to contribute to the support of the university's animal facilities, or its workshops, or its PHD students or postdoctoral students. Persuasive as that argument may be, I think support of that kind should be purely discretionary and efforts to require it as part of a sponsorship arrangement may be viewed quite cooly by a proposed industrial sponsor.

11. *Publicity*

In the ordinary case, I suspect that the interests of the private sponsor and the university will be quite harmonious on the subject of publicity. Neither will be anxious to say too much, if anything, about the sponsorship arrangement, and publicity is likely to be kept at a minimum. Clearly, as little as possible should be said while the negotiations are in progress, notwithstanding the criticisms that may arise from faculty, students and the public when announcement is finally made. A press release or even a press conference may be necessary if the contract is of enough interest. This may include disclosure of the general purposes of the sponsorship, the level of support being provided and the duration of the sponsorship. It is probably best for the university and the sponsor to coordinate their press releases on the matter so as to avoid unnecessary embarrassment.

Subsequent publicity releases concerning the status of the research must also be considered and properly coordinated. Business enterprises are not alone in wanting publicity about new products or other advances in which they have an interest. The university may have its own publicity department anxious to announce a new discovery from its laboratories in order to encourage future sponsors, reward scientists and attract students.

I have touched only very lightly on the kinds of concern the government has raised about industry-academia contracts, and some of the

issues that may have to be faced in actually crafting a workable arrangement. It is difficult to be too specific, for obvious reasons. Sponsors' needs differ; university policies and needs differ, and the kinds of arrangements that can be fashioned are as limitless as your imagination. It has been done and it can be mutually advantageous. I encourage more industrial sponsors to go back to school. It's a lot of fun.

PATENTS AND PUBLICATIONS/ PATENTING LIFE*

DAVID W. PLANT**

I. *Introduction*

A. Of the many legal issues embraced by today's topic, two seem to me to emerge as especially perplexing to academia and industry:

1. What have been traditional rights of an employer and of an inventing employee or consultant in inventions and technological ideas, and are these traditional rights relevant to industry-academia relationships?

   Absent express agreement, and in light of the murky faculty-university legal relationship, it is important to have these traditional rights in mind — especially in light of the evolving, and sometimes dramatically changing, university policies regarding ownership and publication of technological ideas.

2. What constitutes "publication" and what are its effects on property rights in inventions and other technological developments?

   This seems to be a burning issue. But it is an anomaly. It engenders vibrations of fear in every academic. Yet, at the same time, academics are quick to disclaim the value of patent rights. If there are to be no patent rights, there may be no need for restraints on publication, and thus, no issue.

B. I shall not be so bold as to propose specific solutions, because specific solutions must be fashioned in light of a specific factual framework. However, I shall have some general observations.

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*Paper delivered before The Association of the Bar of the City of New York, April 21, 1982.

**Member, New York Bar.

C. At the outset, some of my broad views are:

1. It is appropriate for faculty and student researchers to enter into consulting arrangements, in which the researcher is obligated to assign to the sponsor or principal title to ideas and discoveries created by the researcher during the course of the consultancy.
2. It is appropriate for a university or an outside sponsor to promote and exploit the researcher's invention, on behalf of the researcher, university and/or sponsor, and with some monetary tribute to the researcher, the university and the sponsor.
3. It is appropriate for a faculty or student researcher to be obligated to defer *any* unrestricted disclosure or publication of a new discovery, for a reasonable time, so as to enable the university or the sponsor to consider and to take appropriate steps to apply for a patent. I refer to far more than mere deferral of publication in a journal or submission of a manuscript to a publisher. I mean *any* unrestricted disclosure, as I shall elaborate later. Such temporary deferral can be compatible with customary laboratory interchanges, departmental seminars and peer reviews.

II. *Fundamental Legal Rights Regarding Intellectual Property*

A brief review of some fundamentals as to legal rights and obligations of researchers, university employers and industrial sponsors concerning intellectual property may provide a useful base for considering some of the issues mentioned today. Specifically, it should point up the desirability of having these rights and obligations expressly and unambiguously spelled out for all concerned in written contracts. (Apparently, express contracts between faculty and universities are not likely to be a universal phenomenon.)

A. *Conceiver's Rights*

The originator of a technological idea, i.e., one who independently conceives, has the right to develop it, use it, disclose it, shelve it or conceal it, absent an implied obligation or a contractual obligation to the contrary.

Also, the originator's right to use may be restricted by a valid patent. This may be a contractual obligation, i.e. as provided in a license agreement. But such a restriction may also flow from judicial enforcement of the patent.

B. *Implied, Or Common Law, Ownership Rights In The Ideas Of Employed Inventors*

I have in mind four separate variations of implied ownership rights in an employee-inventor's ideas, i.e., rights which the law implies absent an express contract to the contrary. Each is applicable to faculty and student researchers.

1. If a faculty member is hired *to invent,* i.e., to conduct research, with respect to a *particular* subject matter, *ownership* of the concrete, tangible fruits of the faculty member's research (including inventions) related to *that subject matter,* as a matter of common law, rests in the *employer.*[1] The same is true with respect to an academic consultant retained by an industrial organization.
2. If an employee is hired *to invent* with respect to a *particular* subject matter, and invents with respect to a *different* subject matter, the *ownership* rights usually are held to rest in the *employee.* The employer, however, receives a "shop right", unless the employee works substantially on his own time and substantially with his own facilities.[2]
3. If an employee is *not* hired *to invent, but does so* substantially using the *employer's time* and *facilities, ownership* of the invention rests in the *employee.* However, the employer is entitled to a *"shop right"* in the invention.[3] *U.S. v. Dubilier,* 289 U.S. 178 (1933).

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[1] *Solomons v. United States,* 137 U.S. 342 (1890). Employee of Bureau of Engraving & Printing was assigned duty of devising self-cancelling stamps, which he did. No contract existed *re* assignment of rights. Held rights to the invention are in the government.

[2] See dissent in *U.S. v. Dubilier Condenser Corp.,* 289 U.S. 178 (1933). In *Dubilier,* employees not assigned to invent developed inventions in the radio field which were outside the scope of their work. The Court *refused to order assignment* of the inventions to the employer. Only the dissenting opinion discussed the situation where an *employee generally employed to invent* does so outside the scope of assigned activity. The dissent concluded that the ownership of the invention rested in the employer. Also Gullette, "State Legislation Governing Ownership Rights in Inventions Under Employee Invention Agreements", 62 JPOS 732, 736-38 (1980). But see Jager, "The Rights To The Trade Secrets And Ideas Of Employees And Third Parties" printed in ABA monograph entitled *Sorting Out The Ownership Rights In Intellectual Property* (1980) pp. 147, 148.

[3] *Kinkade v. N.Y. Shipbuilding Corp.,* 21 N.J. 362, 109 U.S.P.Q. 254 (Sup. Ct. 1956). Tinsmith employed by defendant designed simplified method for installing bunk beds on ships. Device was designed on company time and made with company

4. If an employee is *not* hired to *invent,* and makes an invention substantially *independently* of the employer, *all rights* rest in the *employee.* No "shop right" accrues to the employer.[4]
5. Shop Right[5]
   a. A shop right is a non-exclusive license. It is personal, non-assignable[6] and royalty-free. It arises in the absence of an express contract. It is relatively anachronistic in industry, in light of today's sophisticated contractual arrangements. However, it is still viable in academia, where express agreements are not yet so much in vogue.
   b. Generally, an employer gets a shop right if there was "any substantial contribution" on his part.[7]
   c. It is questionable whether shop rights arise in third parties. However, under some circumstances, an industrial sponsor of research performed at a university by a faculty member or a student may have a shop right, especially if the sponsor has relied to the sponsor's detriment on the availability of the invention. This right has been criticized. In any event, insofar as industrial sponsorship of university research is concerned, it is likely that an express contract would control at least between the sponsor and the university or the researcher. However, if the sponsor has contracted only with the university, and the university has no express contract with the researcher, hard questions may arise.

C. *The Laws Of Agency*

The laws of agency are germane to this discussion. They

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material. Since employee-inventor was paid an hourly wage he ended up with less wages when his simplified device was used by his employer. Held employer has shop right and employee entitled to no compensation.

[4] E.g., *Aero Bolt & Screw Co. v. Iaia,* 180 Cal.App.2d 728, 125 U.S.P.Q. 545 (Cal.2d Dist. 1960). No shop right where employee-order clerk had idea for self-sealing fasteners. Employee on own time and at own expense designed and developed device and paid patent costs.

[5] Generally see, Koenig, "The Shop Right — Time For Limitation", 49 JPOS 658 (1967).

[6] Generally, the shop right does pass to a successor to the entire business of an employer.

[7] F. Neumeyer, *The Employed Inventor In The United States: R & D Policies, Law, and Practice,* (1971), p. 42.

apply, absent an express contract, to a faculty or student researcher who consults with an industrial sponsor, or who is retained to conduct research on behalf of the sponsor, or who is retained to conduct research on behalf of the university.

In such circumstances, the researcher can not properly serve two masters in connection with the same transaction without the acquiescence of both masters in the arrangement.

The researcher can *not* properly compete with the university or the sponsor and can *not* properly acquire interests adverse to the university or the sponsor. The researcher's duty is to act solely for the benefit of his principal in the matters entrusted to him, and also to take no unfair advantage of the researcher's position in the use of information or things acquired by the researcher because of his position as agent or because of the opportunities which his position affords.

A researcher is not, however, necessarily prevented from acting in good faith outside his employment in a manner which may adversely affect his principal's business. For example, a university researcher retained by an industrial sponsor to do recombinant DNA research would not violate his duty to the sponsor by advocating environmental legislation which might impact the sponsor.

Unless otherwise agreed, a researcher who makes a profit in connection with acts conducted by him, on behalf of his sponsor, is under a duty to give such profit to the sponsor.

A researcher who, with the sponsor's knowledge, acts on the researcher's own account in a transaction, in which the researcher is retained by the sponsor, has a duty to deal fairly with the sponsor, and to disclose to the sponsor all facts which the researcher knows or should know would reasonably affect the sponsor's judgment, unless the sponsor has manifested that he knows such facts or that he does not care to know them.

The same duty of fairness and disclosure applies to a researcher who, to the knowledge of two sponsors, acts for both of them in a transaction between them. The researcher, however, is under no duty to disclose, and indeed has a duty not to disclose, to one sponsor confidential information given to the researcher by the other sponsor. But if the information is of such a nature that the researcher can fairly give advice to one sponsor without disclosing it, the researcher can properly continue to act as consultant or researcher. Query the impact of the university's role as a teaching institute on this rule.

A researcher is not in a fiduciary relationship with the

sponsor as to matters in respect of which he is not employed. As to matters not connected with the researcher's employment or consultancy, the researcher can properly deal as freely with his sponsor as if the researcher were not an agent, provided that the researcher does not act because of information obtained in connection with the employment or consultancy, and does not act where there is a general confidential relationship between the principal and the agent.

The researcher's duty not to communicate or to use information given to him in confidence by a sponsor applies to information which the researcher should know the sponsor would not want to have revealed to others or used in competition with the sponsor. This does not apply to matters of common knowledge or to special skills the researcher has acquired because of his employment.

D. *Implied Restraints On Disclosure And Use Of Information, Typically Trade Secrets*

1. Implied restraints on disclosure and use of information by a researcher often can embrace information or ideas transmitted by the employer to the researcher, as well as ideas the researcher originates himself. The customs with respect to openness in the university setting obviously are germane to this rule.
2. Such restraints are warranted when the information is acquired in connection with a confidential relationship. The confidential relationship may be the subject of an express contract or it may be implied from the circumstances surrounding the disclosure.[8]
3. A researcher is given more leeway in the personal use of a trade secret, if the secret originated with him. In such cases, a Court is more likely to conclude that the information is part of the researcher's "general knowledge, skill, and experience."
4. Restrictions on the researcher's use and disclosure may survive for as long as the secret status exists or as long as

[8] Plaintiff hired Lawton to build improved machinery to dehair raw cashmere. Plaintiff supplied Lawton with drawings and instructions to produce the machines. Defendant approached Lawton to manufacture similar machines and Lawton did so still having in his possession plaintiff's drawings. Held: tortious misappropriation. *Atlantic Wool Combing Company v. Norfalk Inc.*, 357 F.2d 866 (1 Cir. 1966).

the confidential relationship exists. Thus, the obligation can survive the period of employment. However, a researcher can nevertheless freely use "the general knowledge, skill, and experience" developed by the researcher during employment.[9]

E. *Express Contractual Rights And Obligations*

Recently, universities have been formulating policies which are akin to contracts with faculty members. They purport to provide for ownership of and other rights with respect to inventions. They purport also to provide for the timing and the extent of publication. I have inquired about and have considered briefly, but I have not yet found, a legal basis for enforcing these policies, other than perhaps the common law rights I have just alluded to, or perhaps an implied obligation which arises from circumstances unique to the university setting.

F. *Conclusion*

In sum, as universities are driven by industrial research contracts and other industrial sponsorship, implied legal rights will be significant, but eventually they should and will be supplanted, and appropriately so, by expressly agreed upon rights. Until universitiy policies and university arrangements are the subject of such express contracts, however, it will behoove the researcher, the university and the industrial sponsor to be aware of such rights as the law may imply — and the obligations.

III. *Publication*

A. *The Issue*

The issue is whether or not, and if so, how, the university researcher can discharge his obligation to disclose freely, when at the same time, he is beholden by contract or otherwise to an industrial sponsor (or even to his university) to refrain to one extent or another from publishing.

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[9] *Anaconda Co. v. Metric Tool & Die Co.*, 485 F.Supp. 410 (E.D.Pa. 1980). Plaintiff used special machines to fabricate a strip wound flexible metal hose. Defendant wanted similar machines and hired away some of plaintiff's employees. The employees built the machines for defendant. Employees had no written contract with plaintiff. Issue was whether information taken was within employees' general knowledgee experience, etc. Held: knowledge of actual construction of plaintiff's machine was plaintiff's confidential trade secret. The employees had not played a part in plaintiff's initial development of the machine and thus they breached an implied duty to plaintiff when they disclosed to defendant.

Publication is a term used loosely and with imprecision of definition. Indeed, it appears to me that, in the university policy statements and agreements I have seen, the impact of publication is either misunderstood, overlooked or negotiated away.

A sound understanding of what constitutes publication and of the impacts of publication is necessary to a realistic and fruitful resolution of the issue.

With reasonable resilience in attitudes, this issue can be resolved.

B. *Patentable Technology*

For purposes of this discussion, there are essentially two patent systems in the world: 1) the U.S. and Canadian systems (which I shall lump together and refer to as the U.S. system — even though they are not identical)[10], and 2) the systems of the balance of the world.

In the U.S., our patent system is predicated on the proposition, inter alia, that the original and first inventor should have the patent.

In the rest of the world, the predicate is that the first to apply for a patent should have the patent, regardless of who invented first.

Regardless, however, of whether it is a first-to-invent or a first-to-file system, a patent system anywhere typically grants to patentees *the right* to exclude others from making, using or selling, in the jurisdiction, and for a limited period of time, the subject matter claimed in the inventor's patent. More accurately, in a practical sense, at least insofar as U.S. patents are concerned, this is a right *to attempt* to exclude others. It should not be viewed as an absolute right to exclude. And it clearly should not be construed as the grant of a right to practice one's own invention.

In return for this right to exclude, or to attempt to exclude, the inventor is customarily required to describe his invention in his patent with sufficient fullness, clarity and exactness to enable "any person skilled in the art" — to use the U.S. rubric — to practice the invention. Thus, the inventor is required to disclose, indeed, to publish, his invention to all the world — so that the public will be able to practice the invention when the patent is no longer in force, and equally importantly, while the

[10] The Phillipines are also like the U.S. and Canada.

patent is in force, to enable the public to comprehend and to improve upon its subject matter or otherwise design around it. Further, in the U.S., the inventor is required to describe in the patent the best mode for practicing the invention known to the inventor at the time the application was filed.

These last points deserve emphasis. *A patent is a publication.* It is a document open to public perusal. If the relevant patent statute is complied with, a patent is a full and complete disclosure of the invention and how to practice it. We should not lose sight of this significant fact.

The patentee's right to exclude must be considered in light of the strong public policy in the U.S. *against* monopolies and *in favor* of free access to and use of information and ideas which are already in the public domain. Thus, a patent, i.e., the right to exclude others, is valid only if it claims something new and also something which is more than a routine advance over the state of the art. In other words, ideas and information already known to the public, or obvious to a person skilled in the art, cannot properly be excluded from free use by the public. Accordingly, a valid patent contributes to the fund of public knowledge by disclosing subject matter not previously a part of that public fund *or* which could not have been routinely added to that public fund.

C. *Trade Secrets v. Other Unpatented Technology*

There is a sharp contrast between patents and trade secrets.

Trade secret technology, which necessarily is unpatented technology, is technology which is not widely known and which gives its possessor a commercial advantage.[11] It must be secret and it must be of value. It must be kept in confidence, i.e., its trade secret character must be preserved. A trade secret owner can enforce his rights in the trade secret against someone who derives properly or improperly from the trade secret owner and who misappropriates the secret, i.e., improperly discloses or improperly uses. The trade secret owner thus is necessarily motivated to preserve the secret character of the technology, i.e., is motivated not to publish, for so long as the trade secret owner perceives value in the trade secret. Thus, by definition, from the moment a trade secret is born and continuously until its owner no longer regards it of value, it is quite properly the subject of an effort to withhold it from the

[11] Restatement of Torts §757.

public. Publication destroys the trade secret.

In the case of a patent, this motive to withhold from the public is not proper, and not nearly so powerful. Indeed, as I have noted, a patentee is obligated to disclose fully in his patent.

Thus, from both the academic's and the industrialist's point of view, patents and trade secrets are significantly different properties.

What then is the impact of publication on patent rights?

D. *Impact Of Publication On Patent Rights*

Mr. Justice Brandeis once wrote[12]:

"The general rule of law is, that the noblest of human productions — knowledge, truths ascertained, conceptions, and ideas — become, after voluntary communication to others, free as the air to common use."

From the observations I am about to make concerning "voluntary communication to others," an academic inventor will divine the following two rules:

1. With respect to U.S. Patents —
   a. Make your invention in the U.S. before anyone else publishes it; and
   b. File your U.S. patent application within one year of anyone's publication of the invention, even your own.
2. With respect to patents anywhere else in the world (except Canada) —
   a. File your patent application before anyone, including you, publishes anywhere and in any way.

In my view, it follows that mere 30, 60 or 90 day delays in submitting manuscripts to publishers, or in publishing technical papers in learned journals, may not be enough to save patent rights. Other unrestricted disclosures also will have to be deferred.

1. *Publication before the invention is made*

Every patent system I know of limits patent protection to technology which is new. It follows, therefore, that if an idea has been published before an inventor independently conceives of the idea, the inventor should not anywhere be

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[12] *Internat'l News Serv. v. Asso. Press*, 248 U.S. 215, 250 (1918).

entitled to a valid patent on the idea. An old idea cannot meet the novelty requirements of any patent system.

For U.S. patent purposes, it is important to understand what constitutes invention, so that the date of invention can be ascertained.

Invention, for U.S. patent purposes, comprises two steps: conception and reduction to practice. Conception is the mental formulation of the idea. Reduction to practice (unless only constructive) is the manual demonstration that the idea will work. Both steps have to be performed for an invention to be made. It is not uncommon for an invention to be made over a period of time.

Thus, a publication may intervene between the date of an inventor's conception and the inventor's reduction to practice. Such a publication may bar a U.S. patent on the invention.

This is not an academic matter. Or better put, it is a practical matter for academics. Parallel, independent work in separate laboratories may result in publication by the second to conceive before the first to conceive has reduced to practice. Such a publication may jeopardize the potential right to a U.S. patent of the scientist who was first to conceive.

Of even larger import, for our purposes in considering conflicts between industry and academia, is publication *after* the invention is made.

2. *Publication after the invention is made*

The critical question here is when, prior to filing a patent application, can publication occur without jeopardizing potential patent rights?

a. *U.S. patents*

With respect to U.S. patents, publication more than one year prior to the effective filing date of the application for the U.S. patent will automatically bar the issuance or validity of the patent. The purpose of this forfeiture provision is to encourage prompt disclosure of inventions to be patented and prompt issuance of the patent, if one is to issue, thus disabling the inventor from prolonging the term of exclusivity.[13]

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[13] *Pickering v. Holman,* 459 F.2d 403, 406, 173 U.S.P.Q. 583, 585 (9 Cir. 1972). *Metallizing Engineer. Co. v. Kenyon Bearing & A.P. Co.,* 153 F.2d 516, 520 (2 Cir.

Perhaps two examples of how these rules work will be illuminating:

i. With respect to a U.S. patent, if in chronological sequence (1) an invention is made, (2) it is published, and (3) an application for patent is filed, the publication will not bar the patent if the publication is one year or less before the effective U.S. filing date.

ii. With respect to a U.S. patent, if in chronological sequence, (1) an idea is published, (2) a scientist independently invents the same subject matter and (3) an application for patent is filed, the patent is barred. This is so because the publication preceded the date of invention, and regardless of whether the publication is more or less than a year before the effective U.S. filing date of the application.

Two more temporal aspects of invention and publication are important, insofar as U.S. patents are concerned.

Constructive reduction to practice

Reduction to practice may be constructive rather than actual. That is, an inventor may file a U.S. patent application which properly describes the invention before the inventor manually reduces the invention to practice. The filing of the application is the reduction to practice. The filing of the patent application, therefore, marks the completion of the invention. Accordingly, if reduction to practice has been only constructive, publication of the invention at any time prior to the filing of the application may bar the patent, because the publication is prior to the date of invention, even though the publication occurs less than one year before the application was filed.[14]

1946):

> ... (added) "it is a condition upon an inventor's right to a patent that he shall not exploit his discovery competitively after it is ready for patenting; he must content himself with either secrecy, or legal monopoly. It is true that for the limited period of two years he was allowed to do so, possibly in order to give him time to prepare an application; and even that has been recently cut down by half. But if he goes beyond that period of probation, he forfeits his right regardless of how little the public may have learned about the invention."

[14] If the applicant proves diligence in devleoping the invention and in preparing a patent application on the invention, from the effective date of the publication until

Contemporaneous publication

Publication by a *third party after* the date of the invention and *at any time before the filing* date of the patent application (or even *after* the filing date of the application) may be evidence of invalidity of the patent, notwithstanding that the publication is not an automatic bar with respect to novelty. Such a publication, if it evidences independent, contemporaneous development by another, may tend to establish that the invention in question was obvious and thus not properly patentable.

Also, post-invention characterizations or mischaracterizations of the invention, by the inventor or by others, may adversely affect the validity of the patent.

In sum, the validity of a U.S. patent may be adversely affected by:

publication before the date of invention, even when less than a year before the filing of an application (absolute bar — lack of novelty);

publication more than one year before the filing of an application (absolute bar — forfeiture); and

publication after the invention and less than a year before the application, indeed, even after the filing of the application (evidence of obviousness).

b. *Patents elsewhere*

Publication at any time prior to the effective filing date of an application for patent in any country in the world other than the U.S. and Canada will automatically bar a patent in that country, with few exceptions. This is a concomitant of the first-to-file philosophy on which most patent systems rest. Early filing is plainly encouraged.

Thus, patent protection elsewhere than in the U.S. and Canada is instantaneously and automatically impacted by publication prior to filing. There are very few grace periods.

In Europe, for example, even a document dated after the application date may evidence a bar to patentability. Under the European Patent Convention of 1973, ef-

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the filing of the application, the publication is not available as a reference against the application. 37 C.F.R. §1.131(b).

fective in 1978, a document reproducing a public lecture or describing a use of the invention may evidence the "state of the art," even though the document post-dates the filing date of the European application, if the oral disclosure or use occurred publicly before the filing date. The EPO Examiner will start with the assumption that the later document gives an accurate account of the prior event.

Also under the EPC, publication anywhere bars a patent. The theory is that any geographic restriction on relevant art would prejudice the public, i.e., such a restriction could result, unjustifiably, in a patent's being issued in one jurisdiction on subject matter previously published and thus unpatentable in a second jurisdiction.

E. *What Constitutes "Publication"?*

1. *Printed Publications*

Printed books, papers published in learned journals, articles in newspapers are all forms of publications which may bar a patent.

But other forms of disclosure may also constitute bars.

2. *Public Use, Sale, Knowledge And Invention By Another*

In the U.S., prior knowledge by another[15] or prior invention by another (so long as it is not abandoned, suppressed or concealed) in this country bars a patent on a later invention.

In addition, commercial activities may impact patentability.

In the U.S., and almost everywhere else in the world, commercial use, sale or offer to sell the invention *in the country* in which a patent is sought bars the patent sought on the invention. Indeed, in some countries, use or sale anywhere in the world bars a patent in that country.

Would a university ever, conceivably, invoke such activity to save the university from a charge of patent infringement? Yes. The University of Delaware was recently con-

[15] Knowledge need not be of a reduction to practice, *Application of Borst*, 345 F.2d 851, 854-55 (C.C.P.A. 1965).

fronted with a patent infringement suit in which the university was charged with infringing two patents and with misappropriation of trade secrets. *Watts v. University of Delaware,* 471 F.Supp. 1272, 1275-76, 203 U.S.P.Q. 341, 346 (D.Del. 1979). The subject of the patents and alleged trade secrets were chairs purchased and used by the university. For purposes of our discussion, a chair in a student lounge may not differ from a patented analytical instrument used in a laboratory in connection with contract research, or from a cell line used in a university laboratory on behalf of a sponsor. The University of Delaware prevailed in its defense to the patent infringement claim, because the patented chairs had been in use in a dormitory lounge, primarily for commercial purposes, more than one year prior to the application for the U.S. patent.

> "Thus, use of a device under conditions of *limited public access* may still be a public use. *See Electric Storage Battery Co. v. Shimadzu,* 307 U.S. 5, 19, 59 S.Ct. 675, 83 L.Ed. 1071 (1939); *Marrese v. Richard's Medical Equipment, Inc.,* 504 F.2d 479, 482-83, (C.A.7, 1974); *Magnetics, Inc. v. Arnold Engineering Co.,* 438 F.2d 72, 74, (C.A.7, 1971). Since the *students* who used the dormitory lounge *owed no duty of secrecy to the plaintiff, the fact that the general public did not have access to the lounge is immaterial.* Likewise, the fact that an invention *when used in its natural and intended way may be hidden from the public's eye provides no basis for concluding that a use of the invention is not public. Egbert v. Lippmann, supra,* 104 U.S. at 336.
>
> "The public nature of the June 1974 use does not necessarily render the plaintiff's patents invalid, however. For despite the seemingly absolute wording of the statute, the courts have engrafted an *exception* onto §102(b) *by which a public use incidental to experiment will not bar patentability.*" (471 F.Supp. at 1277)

At 1271:

> "Thus, the plaintiff must prove that his *primary intent in permitting the chair frame to be used in the College Try Program was experimentation.*" (Emphasis added)

In the University of Delaware case, the inventor's use of the invention, primarily for commercial purposes and more

than one year before the U.S. patent application, barred the patent.[16]

Further, disclosure to another in confidence and the other's subsequent public use may trigger the running of the one-year grace period in the U.S.[17]

The Court of Appeals for the Federal Circuit, in a recent decision, has taken a different approach in assigning the burden of proof with respect to experimental use and the public use doctrine of § 102(b). In *TP Laboratories, Inc.* v. *Professional Positioners, Inc.*, Appeal Nos. 83-660/680, Slip Op. (Fed.Cir., January 4, 1984), the Court reversed the finding of the District Court for the Eastern District of Wisconsin of the invalidity of plaintiff's patent, related to an orthodontic appliance, for prior public use under § 102(b).

The inventor had used the appliance claimed in his patent on three patients more than one year before the filing of his patent application. In holding that these three public uses were experimental, the Court stated that the District Court had improperly placed the burden of proof on the patentee to show the experimental nature of the uses. The Court observed that the burden of proving that a patent is invalid remains at all times with the challenging party and never shifts to the patentee. The Court cautioned (Slip Opin. at 14-15) that a trial court must consider all the evidence and determine whether there had been a public use:

> "[I]t is incorrect to impose on the patent owner, as the trial court in this case did, the burden of proving that a 'public use' was 'experimental.' These are not two separable issues. It is incorrect to ask: 'Was it public use?' and then, 'Was it experimental?' Rather, the court

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[16] In the U.S., secret use by another before the invention in issue may not be a bar. *Gillman v. Stern*, 114 F.2d 28, 31 (2 Cir. 1940). This is so because the invention has not become a part of the public's fund of knowledge. (Also, such prior use, if concealed, will not qualify as prior invention.)

[17] *Lorenz v. Colgate-Palmolive-Peet Co.*, 167 F.2d 423, 429-30, 77 U.S.P.Q. 138, 144 (3 Cir. 1948). Defendant misappropriated plaintiff's process, which was regarded as a trade secret before plaintiff's patent issued. The issue was whether or not the public use by one who employs a process in breach of a fiduciary relationship, should bar the inventor from the fruits of his monopoly (167 F.2d at 426). The Court ruled in the affirmative (167 F.2d at 429):

is faced with a single issue: Was it public use under § 102(b)?

"Thus the court should have looked at all of the evidence put forth by both parties and should have decided whether the entirety of the evidence led to the conclusion that there had been 'public use.' This does not mean, of course, that the challenger has the burden of proving that the use is not experimental. Nor does it mean that the patent owner is relieved of explanation. It means that if a *prima facie* case is made of public use the patent owner must be able to point to or must come forward with convincing evidence to counter that showing."

3. *Manuscripts, College Theses, Government Reports, and Other Disclosures*

   a. *Available to the public*

   The law in the U.S. has evolved so that the touchstone is accessibility by the public to the information in issue, enabled by wide dissemination.

   In some Federal Courts, a document is publicly available if distributed or available to any segment of the public.[18]

"The prior-public-use proviso of R.S. §4886 [the then controlling statutory provision] was enacted by Congress in the public interest. It contains no qualification or exception which limits the nature of the public use. We think that Congress intended that if an inventor does not protect his discovery by an application for a patent within the period prescribed by the Act, and an intervening public use arises from any source whatsoever, the inventor must be barred from a patent or from the fruits of his monopoly, if a patent has issued to him. *There is not a single word in the statute which would tend to put an inventor, whose disclosures have been pirated, in any different position from one who has permitted the use of his process.*" (Emphasis added).

[18] *Popeil Brothers, Inc. v. Schick Electric, Inc.*, 494 F.2d 162, 166, 181 U.S.P.Q. 482, 485-486 (7 Cir. 1974):

"To constitute a printed publication for purposes of the publication bar, all that is required is that the document in question be printed and so disseminated as to provide wide public access to it. Pickering v. Holman, 459 F.2d 403, 407, (9th Cir. 1972); Deep Welding, Inc. v. Sckiaky Bros., Inc., *supra* at 1235 of 417 F.2d, Jockmus v. Leviton, 28 F.2d 812, 813 (2nd Cir. 1928). *The key factor is* not access by a specific segment of the public, or number of persons, or even by any specific means, but simply *distribution to any segment of the public.* Pickering v. Holman, *supra,* at 407 of 459 F.2d, 1 Deller's Walker on Patents, 273 §60 (2nd ed. 1964)." (Emphasis added).

In the Court of Customs & Patent Appeals a different standard was invoked. In 1978, the C.C.P.A. stated that the document in issue must be accessible to "the public concerned with the art."[19] According to the C.C.P.A., access may be limited to a part of the public so long as accessibility is sufficient to raise a presumption that "public concerned" with the art would know of the invention.[20]

A current question is what standard will apply in the new Court of Appeals for the Federal Circuit for patent cases, i.e., the current C.C.P.A. combined with the Court of Claims. It does not require extraordinary daring to speculate that the C.C.P.A., in its new garb, will follow its previous standard and not some other standard — until a hard case comes along.

It follows from any of the foregoing criteria, for example, that submission by an author to a journal of a manuscript for publication is not likely to qualify the submitted manuscript as a printed publication in the U.S.[21] The manuscript must become publicly available, e.g., through distribution of the journal.

b. *In writing*

In the U.S., a "printed publication" must be in writing. To qualify as a writing, it need not have been produced on a printing press, but it must be in or on a

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[19] *Application of Bayer*, 568 F.2d 1357, 1361, 196 U.S.P.Q. 670, 674 (C.C.P.A. 1978); *Phillips Elec. & P. Indus. Corp. v. Thermal & Elec. Indus.*, 450 F.2d 1164, 1170-71, 171 U.S.P.Q. 641, 646 (3 Cir. 1971):

"In considering a claim for infringement of a patent, the court in Garrett Corp. v. United States, 422 F.2d 874, 190 Ct.Cl. 858 (1970) adopted with approval the opinion of the trial commissioner which stated:

> "'To be a "publication" under the statute, a document must, among other things, be accessible to the public. *The public, for purposes of the statute, constitutes that class of persons concerned with the art to which the document relates and thus most likely to avail themselves of its contents.* Factors bearing on whether a document was published include the number of copies made, availability, accessibility, dissemination and even intent. In re Tenney, 254 F.2d 619, 45 C.C.P.A. 894 (1958).'

"422 F.2d at 877-878" (Emphasis added).

[20] *Application of Bayer*, 568 F.2d 1357, 1361, 196 U.S.P.Q. 670, 674 (C.C.P.A. 1978).

[21] E.g., *Application of Schlittler*, 234 F.2d 882, 883-84 (C.C.P.A. 1956); *Bergstrom v. Sears, Roebuck and Co.*, 457 F.Supp. 213, 221-22, 199 U.S.P.Q. 269, 277 (D.Minn. 1978).

reasonably permanent medium.

It may be typewritten.[22]

It may be partly typewritten and partly in manuscript.[23]

A thesis which comprised inter alia "95 pages of typewritten matter interspersed with numerous hand drawings and involved mathematical equations in long hand" has been held to be a "publication".

c. *College thesis*

A college thesis available in a university library is a publication.

The Court in *Hamilton Laboratories v. Massengill,* 111 F.2d 584, 585, 45 U.S.P.Q. 594, 595 (6 Cir. 1940), declared that a typewritten master's degree thesis in the Iowa State College library, available to students there and to other libraries having exchange agreements with Iowa State, was a publication for purposes of U.S. patent law. The author's intent to make the fruits of his research available to the public was regarded as determinative.[24]

The *Hamilton Laboratories* Court's emphasis on intent was more recently iterated in *Honeywell Inc. v. Sperry Rand Corp.,* 180 U.S.P.Q. 673, 710 (D.Minn. 1973).[25]

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[22] *Gulliksen v. Halberg v. Edgerton v. Scott,* 75 U.S.P.Q. 252, 253 (PO Bd App 1937).

[23] *Ex parte Hershberger,* 96 U.S.P.Q. 54, 55, 57 (PO Bd App 1952).

[24] "While perhaps not determinative of ultimate issues in the present case, the Weed thesis is in the prior art and marks a step in its development since it was put on file in the library of the college, available to students there and to other libraries having exchange arrangements with Iowa State. John Crossly & Sons v. Hogg, 83 F. 488, 490; Britton v. White Mfg. Co., C.C., 61 F. 93, 95. We think *intent* that the fruits of research be available to the public *is determinative* of publication under the statute whether the paper be printed or typewritten, although the court below decided otherwise." (Emphasis added).

[25] ".3 The statute is based upon the public policy that once an invention has been made accessible to the public through printed publication, it cannot thereafter be withdrawn into a legally sanctioned patent monopoly.

"4. A descriptive document qualifies as a printed publication even where only a single typewritten copy is put on file in the library of a college, because it is the *expression of an intent* that the fruits of research be available to those of the public who have an interest in the subject matter that *is determinative* of the fact of publication.

"5. *Distribution* of a *small number of copies* of a descriptive document to a *limited group* of individuals *skilled in the art,* who are *outside the distributor's organization, is publication* within the meaning of the statute." (Emphasis added).

Consistent with the C.C.P.A.'s stricter view of publication, i.e., its more pro-patent view, the C.C.P.A. held[26] that a University of Toledo graduate student's thesis was *not* a publication as of the date it was defended by the student before a three-member graduate committee, or at any time after receipt at the university's library *until indexed* in the customary fashion.

In so ruling, the C.C.P.A. disparaged the *Hamilton Laboratories* opinion (568 F.Supp. at 1362):

> "we think that, as an expression of the applicable law concerning printed publications, it is ill-conceived, and we decline to follow it."

Earlier, in 1952, the Patent Office Board of Appeals had held[27] a 1940 Ph.D thesis submitted to the University of Michigan to constitute a printed publication notwithstanding the following printed notice at the front of the thesis:

> "'RULES COVERING USE OF MANUSCRIPT THESES IN THE UNIVERSITY OF MICHIGAN LIBRARY AND THE GRADUATE SCHOOL OFFICE
>
> "'Unpublished theses submitted for the doctor's degrees and deposited in the University of Michigan Library and in the Office of the Graduate School are open for inspection, but are to be used only with due regard to the rights of the authors. For this reason it is necessary to require that a manuscript thesis be read within the Library or the Office of the Graduate School. If the

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[26] *Application of Bayer*, 568 F.2d 1357, 1359-62, 196 U.S.P.Q. 670, 673, 674, 675 (C.C.P.A. 1978). *In re Bayer* was followed in *Bergstrom v. Sears, Roebuck and Co.*, 457 F.Supp. 213, 222, 199 U.S.P.Q. 269, 277 (D.Minn. 1978).

[27] *Ex parte Hershberger*, 96 U.S.P.Q. 54, 55-56, 56 (PO BdApp 1952) from the Patent Office Board of Appeals ruled:

> "The thesis was given to the University of Michigan, a public institution, and placed on the shelves of the library of that public institution. A *primary purpose* of so placing the thesis on the shelves was to *make known the contents thereof to the general public*, a condition to which the *author must have at least tacitly agreed* in offering the treaties [sic] to the University. He, therefore, did not and could not restrict the circulation of the thesis to a limited number of individuals. Hence no restriction appears to have been placed on the reading of the text. It was available to anyone to read who was interested therein. Potentially, therefore, the thesis had a wide field of circulation." (Emphasis added).

thesis is borrowed by another Library, the same rules should be observed by it. Bibliographical references may be noted, but passages may be copied only with the permission of the authors, and proper credit must be given in subsequent written or published work. Extensive copying or publication of the thesis in whole or in part must have the consent of the author as well as of the Dean of the Graduate School.

"'This thesis by _____ has been used by the following persons, whose signatures attest their acceptance of the above restrictions.

"'A Library which borrows this thesis for use by its readers is expected to secure the signature of each user."[28]

Also, prior to later C.C.P.A. pronouncements, a typewritten thesis placed on the shelves of the library at M.I.T. had been held by the Patent Office Board of Appeals to be a printed publication *as of the date of receipt by the library.*[29]

So, insofar as the U.S. Patent & Trademark Office is concerned, based on recent C.C.P.A. declarations, a college thesis must be not only received, but also properly indexed and made available, by the college library, in order to qualify as a publication.

d. *Government research reports*

An "Unclassified" government research report has been held not to be a "printed publication" within 35 U.S.C. section 102(b), even though the report was dated

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[28] Query whether this restrictive statement is consistent with a university's function as an open, teaching institution.

[29] *Gulliksen v. Halberg v. Edgerton v. Scott,* 75 U.S.P.Q. 252, 257 (PO BdApp 1937). On a renewed petition for rehearing, the Board of Appeals declared:

> "Since both affidavits referred to above clearly show that the thesis was received September 25, 1929, it is held that the dates when the same was bound or indexed is of no importance for the thesis became available to the public as soon as received in the library."

In citing *Guilliksen, Ex parte De Grunigen,* 132 U.S.P.Q. 152, 154-55 (PO BdApp 1958), the Board held that a University of Florida thesis "became available to the public after it was processed" by the University's library.

22 months before the application date.[30]

The 25 copies were not shown to have been circulated or available beyond a stated distribution list. The Patent Office ruled that the "Unclassified" status of the report was not relevant on the issue of the government's approval of distribution outside proper government circles.

In a 1981 opinion, however, the Patent & Trademark Office decided a similar case differently.[31] The Board held that an Army R & D Technical Report was a printed publication, because (1) the "printed" Report was distributed to 103 addressees before the critical date, and (2) it had been included on the Advisory Group on Electron Devices (AGED)'s list of reports received, the list having been distributed before the critical date. (The R & D Report was not listed by the DDC as available to the public until nine days after the critical date.)

The Board found that the report was not "'one of an internal organizational character'" (at 385).

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[30] *Ex parte Suozzi,* 125 U.S.P.Q. 445, 446-47 (PO BdApp 1959).

As for the distribution list (446-47):

"[E]ach of the entities named thereon would appear to be a regular Governmental installation, or an individual in regular Governmental service, either military or civilian, named as a recipient of a copy of the report because of some relation of the subject matter of the latter to work of said entity. Hence, it seems clear to us that the report is one of an internal organizational character and that each of the aforesaid entities, in receiving a copy of the report, would be doing so in an official capacity and not as a part or member of the general public. On this basis, we see no establishment of publication for the reference report merely by the distribution thereof, in and of itself, denoted on said list."

And as to the report's "Unclassified" status (447):

"Nor would any connotation of such publication follow from the fact of the term 'UNCLASSIFIED' appearing on the reference document. As we see it, this term refers in accordance with conventional usage specifically to security aspects. Thus, while said term might signify lack of 'a confidential nature', using the words of the examiner this would be 'not confidential' only in the security sense of here indicating lack of sufficient pertinence to national defense. Said term would not necessarily denote approval to or lack of administrative prohibition against loose or indiscriminate dissemination of the information contained in the reference report outside of proper Governmental circles, as for example, to those others or members of the general public referred to by the examiner."

[31] *Ex parte Goell and Smith,* 212 U.S.P.Q. 384, 385 (PO BdApp 1981).

Also, in the Circuit Court of Appeals in D.C., another U.S. Army report was held to be a "printed publication."[32]

e. *In the U.S., oral disclosure to the public is not a "publication"*

The reading of a paper before the American Chemical Society in 1919, together with the exhibition at the meeting of typewritten copies to members, did not constitute a printed publication bar. The paper was *subsequently printed* after the critical date. *Corona Co. v. Dovan Corp.*, 276 U.S. 358, 372-73 (1928).

However, it has more recently been held that the distribution at a conference of a technical paper, which is also read at the conference, even in a foreign country, may constitute proper evidence of prior art. This is true where the conference is a public meeting of persons skilled in the art under consideration.[33]

A public lecture before a medical association, with slides, may constitute prior art, if the slides are available prior to the critical date, i.e., if prints are made available.[34]

f. *Microfilm*

Microfilm, properly indexed, may be sufficiently accessible to the public so as to constitute a publication.[35]

4. *"Publication" in European Patent Convention Countries*

To be patentable under EPC, in effect since 1978, an invention must meet both the novelty and the non-obviousness requirements.[36]

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[32] *Boileau v. Diamond*, 659 F.2d 247, 248-249 (D.C.Cir. 1981). (It is not clear precisely what events qualified the report as a publication, or as of what date.)

[33] *Deep Welding, Inc. v. Sciaky Bros., Inc.*, 417 F.2d 1227, 1235, 163 U.S.P.Q. 144, 150-51 (7 Cir. 1969).

[34] *Regents of University of Cal. v. Howmedica, Inc.*, 530 F.Supp. 846, 859-60 210 U.S.P.Q. 727, 738-39 (D.N.J. 1981).

[35] *Phillips Elec. & P. Indus. Corp. v. Thermal & Elec. Indus.*, 450 F.2d 1164, 1171-72, 171 U.S.P.Q. 642, 645-47 (3 Cir. 1971).

[36] *Article 52(1):*

Invention must be "new" and must "involve an inventive step".

Article 56:

Invention involves an inventive step if, having regard to the state of the art, it is not obvious to a person skilled in the art.

Article 54(1):
An invention shall be considered to be new or novel if it does not form a part of *the state of the art.*

Article 54(2):
The state of the art . . . comprises *everything* made available to the public by means of a *written* or *oral* description, *by use,* or *in any other way.*

A six month grace period is provided in only two limited circumstances.[37]

Under the EPC, the novelty question is whether or not the invention as such has already been described *or* worked in public before.

Under the EPC, "the public" is to be construed in its broadest sense. It is irrelevant who actually has taken note of the information concerned. The decisive factor is whether or not the information could be acquired on an unrestricted basis by members of the public.

If the information is provided under a bar of confidentiality restricting its use and dissemination, it is not part of the "state of the art".

Under the EPC, a document destroys novelty of any claimed subject matter described fully and unambiguously (i.e. "derivable directly and unambiguously") in the document, including any features implicit to a person skilled in the art from what is explicitly contained in the document, e.g. an unstated, but inherent, result.[38]

a. *Oral Description Under the EPC*

Oral description places information in the "state of

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[37] *Article 55:*
If disclosure is no earlier than *six months* preceding European filing date, if due to

(a) "an evident abuse in relation to the applicant or his legal predecessor",

(b) display of the invention by the applicant or his legal predecessor at an official, or officially recognized, international exhibition [falling within the terms of 1928 Paris Convention on exhibitions, as revised in 1972], if the applicant files with the European Patent Office an appropriate statement and supporting certificate.

Under the EPC, "an evident abuse in relation to the applicant" is typically unauthorized derivation from the applicant and disclosure against his wish. E.g., an eavesdropper at a private or otherwise restricted discussion.

[38] A document is interpreted as it would have been read by a person skilled in the art on the date of its publication or date of filing, if an application for a patent (Art. 54(3)).

the art" category when facts are unconditionally brought to the knowledge of members of the public in the course of a conversation or a lecture, or by means of radio, television or other sound reproduction equipment.[39]

Thus, under the EPC, oral disclosure of information at meetings of learned societies and in informal discussions among colleagues may be a bar to patentability.

The contrary is so with respect to oral descriptions made by and to persons who were bound to, and did, preserve secrecy, *and* with respect to oral disclosures no earlier than six months before the filing of the European patent application and which derive directly or indirectly without authorization from the applicant or his legal predecessor.[40]

b. *Use And Other Forms of Publication Under the EPC*

"Use" includes producing, offering, marketing or otherwise exploiting a *product,* or offering or marketing a *process* or its application or applying the process. Marketing includes sale and exchange. Such activities are within the compass of the "state of the art".

Also, demonstrating an object or process in training courses or on television, or inspection of a manufacturing process in a factory, may cause an invention to become a part of the "state of the art".

As with other disclosures, an express or tacit agreement of secrecy, or a relationship based on good faith or trust, may except an event or disclosure from becoming a part of the "state of the art". For example, use on non-public property (e.g. factory, military installation) may not be a use available to the public, because the participants are likely to be bound by secrecy. But an open-house, community demonstration or family day may qualify a disclosure or use on such occasion as a part of the state of the art. (*Query* as to whether a departmental seminar, or an informal discussion or demonstration in a university laboratory, qualifies as a part of the state of the art? Can the university impose the requisite umbrella of confidentiality on such activities?)

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[39] A. Turner, *The Law of the New European Patent* 3421 (1979).

[40] A. Turner, *The Law of the New European Patent* 3421 (1979).

To sum up:

> "Availability to the public . . . includes *all possibilities* which technological progress may subsequently offer of making available the aspect of the state of the art concerned." *(Guidelines for Examination and Opposition in the European Patent Office* d.V3 (3.1.1)).

IV. *How To Reconcile Academia's Obligation To Disclose With The Patent Laws And Trade Secret Laws*

The growing industrial presence in academia creates the tensions which have been discussed earlier today. The sponsor wants to protect his investment and enhance the prospects of a return on the investment. The researcher wants freedom to create and to disclose with respect to any subject of his choice. The two objectives are indisputably incompatible. Trade-offs and reconciliation are required. They are both possible and practicable.

A. *Patent Laws*

Assuming patents are indeed of significance to academia and industry, a reasonable reconciliation of academia's obligation to disclose, with the patent laws' forfeiture for premature disclosure, is for academia to defer, for a reasonably short time, *any unrestricted disclosure* of a new development which might jeoparadize patentability in any country of legitimate interest to the sponsor.

By "any disclosure", I mean, for example, informal communications, departmental seminars, peer reviews, lectures, the reading of papers at technical society meetings, printed publications, press releases, press conferences, demonstrations and offers to sell.

By "unrestricted," I mean disclosures made without restriction as to who the audience is, or as to what the audience can do with the information. A disclosure expressly in confidence for the limited purpose of evaluating the idea, and with the understanding that the idea will not be used for any other purpose and will not be disclosed to others, should suffice. But just as a single unrestricted disclosure may bar a patent, so may an unlimited number of otherwise restricted disclosures have the same effect. What I am suggesting is that merely restricting the composition of the audience and what they can do with the information is not enough. Repeated iterations should be avoided.

On this score, it may also be important — and consistent

with academic standards — to monitor the content of such disclosures, from the standpoint of their impact on patentability on grounds other than novelty (e.g., obviousness, utility, scope of invention).

I should add that the majority of university policy statements with which I am familiar do not seem to have taken into account all these factors.

B. *Trade Secrets*

Trade secrets frame a far more difficult issue than the patent issue.

I see no easy and comfortable way for academia to be bound to non-disclosure for the life of a trade secret.

Before the current escalation in sponsored research and the recent mushrooming of research at universities in biotechnology, it was often possible to draw a line between basic research and applied engineering. Basic research was typically conducted at the university's laboratory; applied engineering, typically in industry's laboratory. Trade secrets were less likely to evolve from the basic research than from the applied engineering. Thus, the trade secret issue was not so difficult to handle, because academia was not so often or so dramatically confronted with it.

Today, however, there is more industrially sponsored research, and the applied science in molecular biology follows close on the heels of the basic research. The line between basic research and applied science is blurred. Both occur in the university laboratory. Thus, it is more likely that potential trade secrets will emerge from university work in molecular biology. The trade secret issue is, consequently, starkly present and plainly troublesome.

Broadly speaking — and I am speaking broadly because my views will necessarily be influenced by specific fact situations — it seems to me that the academic researcher can *not* be bound to preserve in perpetuity the secrecy of the fruits of his research.

Broadly speaking, it seems to me that the most the industrial sponsor can bargain for and obtain is deferral of disclosure for a reasonable time until appropriate steps are taken with respect to patent rights. Thereafter, the academic researcher should be free to disclose.

OVERVIEW AND THE VIEW AHEAD*

THOMAS A. BARTLETT**

First of all, let me express my gratitude to the Bar Association and to this gathering of lawyers for giving universities the last word. That's probably more than we deserve, but we need every help we can get on this particular issue.

Let me begin by trying as best I can to pick my way through themes of the day and then move on as Curt has suggested to some of the issues that are developing and to what may be the issues as we move ahead. There will be nothing very startling in anything that I say; because as far as I can tell, there isn't anything very startling in the topic before us. We are groping our way into the future using much material that is familiar.

The problem that brings us together is a particular moment in the development of biological sciences; a moment which has brought into the discussion of science and institutional relationships some rather sensational examples involving money. These occur at a time when universities and basic research generally are feeling insecure about their funding sources.

President Muller made three points that begin the examination of the issue from the university perspective. First, research and teaching must stay locked together. That's not inevitable, but it is so clearly preferable as to be, in the opinion of many, almost the only arrangement.

Second, the university must remember that teaching and training are central to its mission even when it is conducting research, perhaps even especially when it is conducting research.

Finally, there are special conditions for linking together research and teaching which — while not logically necessary — from experience seem to be critical. An example is openness — through open communi-

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**President, Association of American Universities.

cation at the same time and in many places to work at the "state of the art", and to do so in a process in which learning and teaching are central — as contrasted with essentially commercial purposes.

President Muller and President Lederberg both were agreed that the need for funding of research, both research processes and research institutions, had become a critical problem. But both were also aware that we had to approach commercial and industrial ties with caution even though that might be one more important way of trying to deal with the problem of shortages of support for research, and for institutions that do research. It seemed to me they were not in agreement, however, as to just how much risk they thought we ought to take.

If I could infer correctly from some shades of meaning in their two presentations, it seemed to me that President Lederberg was prepared to go a little farther in accepting degrees of risk in order to achieve the important objectives of greater support from industry and of greater interaction with industry, which would be a benefit to the university as well as to industry.

It was clear that Professor Lederberg was raising a very interesting idea as part of his notion that greater risk is warranted when he was suggesting almost as an afterthought that it was the responsibility of the universities to try to help faculty members work through the gray areas. We've had some rather sensational cases with individual faculty members. Probably universities are going to have to do a good deal more internally to try to clarify their own expectations. I want to return to that in a moment.

It seems to me that Ed David and Steve Muller were very interesting in the juxtaposition of their ideas because they were talking about the same world and most of the same values; one from the university point of view, one from the industry point of view, but with differences that came from their different perspectives. They were agreed on the centrality of teaching and on the development of people as a university purpose, both from the perspectives of the university and of industry. They were in agreement that the principle of innovation required earlier links than we now have between the processes of research and the processes of exploitation, and the process of innovation needed to be principally in industry and not in the university because the more universities became the agent of innovation, the greater the conflicts that would come with university principles.

All the speakers this morning kept dealing with one problem in various ways and that was the issue of how to handle information so that there may be some restraint on its distribution, but at the same time openness. That's a neat trick! We're going to struggle with it continually. Each person put a slightly different shade on the problem,

but clearly, how to handle the issue of communication among scientists is central as we worry about university-industry relationships in the process of innovation.

Finally, Ed David made an interesting point when he pointed out that lawyers may be able to help as counselors and educators to the parties in trying to help each to understand the position of the other. I'm not sure of that, because I suspect most of the education that will transpire will be the education of lawyers in order to counsel their clients.

Now I want to look at some general issues that underly points that arose this morning. I shall then go on to some different concerns.

First of all, I think it's worth emphasizing, because it seems to me it's constantly getting lost in the public debate, that there is a long tradition of relations between universities and industry and commerce. We are not at the beginning of a new world. Think of the long tradition of university-industry relationships at every point in agriculture; the long tradition of people from business schools in the United States working with corporations in all kinds of relationships; the long tradition of engineering schools working with industrial organizations in a great variety of relationships; the way medical processes move from basic research into patient care in a continuum in which it's very difficult to find the separation. Even in music and art, there's a long tradition of university institutions being involved with "the commercialization of the product." We do have a lot of experience from our history that will help us in the present. I was very much struck by Professor Lederberg's comments in that regard, and that this present rather special circumstance in biology isn't going to last.

Let me turn to what it seems are the special points of sensitivity for universities. Those themes have run through the morning and through the afternoon as well.

First, clearly, is the issue of openness: How are we to deal with openness among principal investigators and graduate students, processes of communication that are so fundamental to the university and research communities? Such openness is absolutely crucial from the point of view of universities. As universities seek good practices they must err in any compromises on the side of openness and not on the side of making greater concessions to proprietary control of information.

Second is the problem of how to choose the directions of scientific research. We have developed in the last forty years a very elaborate system by which scientists, individually and collectively, try to identify scientific priorities. That's an essential part of the process which we need to protect in whatever is to be done.

Third, we need to protect the principle that research and advanced training go together, as Steve Muller so eloquently agreed this morning.

Fourth, universities must stress that teaching and research keep up with advanced knowledge; university teaching and research cannot be following along, simply exploring old questions as a means of teaching. Keeping up poses very heavy problems for universities.

Finally, universities must protect the principle that there cannot be exclusive relationships in scholarship. Where there are special relationships, they must be limited, with very strict bounds put around them because in university processes there must be the freedom to move among many kinds of relationships.

I hope there is agreement that, since we are not dealing with what will be the permanent circumstances of the biological sciences, we should not try to generalize our present problems of challenges and opportunities excessively; that we are prepared to live with a somewhat messy situation for a time while the supply of people with certain kinds of training increases and while the distance in time between basic research and commercial products gets much longer as it has traditionally been and as it is in almost all other disciplines. We've got to get beyond the circumstance in which laboratory work is immediately merchantable. That time will come. Therefore, it would be a mistake to try to devise for all time a set of relationships and institutions that respond precisely to the condition that exists today.

The intensity of the concern that has come to us, particularly in the press, has caused a great deal of discussion and that leads me to the next point that I wish to emphasize. Everywhere in the university world discussion is going on of the sort that we are having today. There is almost an obsession with the issues that university-industry relationships raise. Universities are institutions that move by talking; by people ruminating on problems; and discussing them; to some extent, by wearing each other down through a process of analyzing and reanalyzing and stating and restating until gradually understanding and consensus grows. Such a process is going on. Its importance should not be underestimated. You've heard about the Pajaro Dunes meeting; our first AAU general discussion on the subject was two or three years ago; another major meeting is coming up at the University of Pennsylvania this fall: Bob Rosenzweig is chairing an AAU group to respond to one set of related issues that Congressman Gore has raised; professional meetings commonly have a section on our topic; on every campus, faculty, over coffee and in informal meetings, encounter our topic: what should the rules be? what processes are needed?

It is a perfect case of the way universities traditionally respond to new problems. That process should continue and, to the major extent possible, be allowed to work itself out. You are beginning to see faculties developing new statements about their own responsibilities; not of a revolutionary different sort, but restatements drawing on past traditions that need to be interpreted in slightly different circumstances today. That process will continue to work around our issues — publications, to delay or not to delay; patent rights and royalties; exclusivity, whether it be exclusivity of funding or of relationships or of training opportunities; the possibility of new joint forums; who should decide through what process as to what work should go forward; the issue of private gains coming out of processes that were publicly funded. These issues will continue with us.

We've heard about problems in research funding growth out of support from government. It seems to me a word needs to be said about that. We hit the peak of federal support for research in the late sixties, and early seventies. Funding then went down drastically at the beginning of the seventies. In the past couple of years, we've been working our way back. We haven't had really dramatic blips up or down since that rapid decline at the beginning of the seventies.

But we have, to a significant extent, been living off our capital in instrumentation and facilities for ten years. That capital, the infrastructure that supports basic research in universities, is depreciating. We are like the steel industry in 1970, or the automobile industry in 1975 — we've been living off our capital too long. That problem is going to be very much a concern for universities in dealing with industry. Universities will be after access to state-of-the-art equipment, to state-of-the-art laboratories, which in many cases universities do not have. Universities are not just concerned about project and operating funds. We do not have in enough places the infrastructure of laboratories and equipment for doing very advanced work.

Let me just close by suggesting that there are two courses open to us, and they are obvious from what I've said. The one course is to try to develop a code. We have been invited by Congressman Gore in a letter to the Association of American Universities to develop a code of good procedure which would protect the integrity of universities and the public interest generally, in the relationship between universities and industry, particularly in biological research. It is a reasonable response from a public figure to what he reads in the newspapers.

The National Institutes of Health Director's Advisory Committee has been discussing what the NIH should do about possible changes in policies which might take into account the new concern for patents

and publications and so on. It would be a mini-code for one particular set of issues.

Responding in a systematic, codified way to the broad range of issues we've been talking about is one of the courses that is being pressed on us. It seems to me it's clearly the second best course.

The alternative response, which I would have thought was much more appropriate to the circumstances and to our traditions, is to continue just what we're doing. To use some of your idiom — we need a whole lot more case law. We need to let many more individual institutions try to deal with their problems from their special perspectives. Each institution has a different set of strengths and circumstances; a different history in the development of its own internal relationships and processes; a different location and set of circumstances in its relationships with industry. But nearly all major universities are somehow confronting the issue of university-industry relationships. That process of exploration, of trial and error, of communication amongst the people most involved, needs to go forward for a period of time. We may at some point in the future discover that we do need some general statements that try to codify experience, but we're not there yet. One of our concerns, instead, must be to try to maintain the momentum of decision making and experimentation that Dr. David mentioned this morning among universities and industries that work with universities.

PATENT ARBITRATION: PAST, PRESENT AND FUTURE*

THOMAS G. FIELD, JR.**

I. INTRODUCTION

Most attorneys have heard of arbitration, but few have more than a vague idea of what it is or have any experience with it.[1] Patent attorneys are no exception, and many are no doubt wondering about the implications of §294.[2] It was enacted in August of 1982, and went into

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*Delivered at an American Arbitration Association Conference in Boston. The author is grateful to Franklin Pierce Law Center and to Vincent Youmatz, a law student, for research assistance in preparing this paper.

**Professor of Law, Franklin Pierce Law Center. Professor Field was the "Consumer Advocate" on the Chrysler Corporation's New Hampshire Customer Satisfaction Board for about three years, has sat as sole arbitrator in copyright dispute, and has been selected as arbitrator in several cases settled prior to hearing. He is also a former Patent Examiner.

[1] Part of the reason is its lack of coverage in most law schools. Where a course *is* offered, it is frequently a seminar. *See, e.g.,* DIRECTORY OF LAW TEACHERS 1983-84, 752-53 (West, 1983). As a consequence, most students do not have the opportunity to take it. Moreover, it would be surprising if most of the courses did not focus primarily or exclusively on the use of arbitration in industrial relations, thus encouraging students to think of arbitration's utility far more narrowly than is warranted. (*See, e.g.,* Reilly, note 6, *infra,* at 24.)

[2] P.L. 97-247, §17, 96 Stat. 322-23 (1982) reads:

> (b)(1) Title 35, United States Code, is amended by inserting after section 293 the following new section of chapter 29:
>
> "§294. Voluntary arbitration
>
> "(a) A contract involving a patent or any right under a patent may contain a provision requiring arbitration of any dispute relating to patent validity or infringement arising under the contract. In the absence of such a provision, the parties to an existing patent validity or infringement dispute may agree in writing to settle such dispute by arbitration. Any such provision or agreement shall be valid, irrevocable, and enforceable, except for any grounds that exist at law or in equity for revocation of a contract.

effect in February 1983: Why was it needed and passed, and what does it mean?

The short answer to why it was needed is that several cases had raised doubts about the extent to which patent disputes could be resolved by arbitration. It was passed as a result of hard work by some patent attorneys and, more importantly, a political climate which was,

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"(b) Arbitration of such disputes, awards by arbitrators and confirmation of awards shall be governed by title 9, United States Code, to the extent such title is not inconsistent with this section. In any such arbitration proceeding, the defenses provided for under section 282 of this title shall be considered by the arbitrator if raised by any party to the proceeding.

"(c) An award by an arbitrator shall be final and binding between the parties to the arbitration but shall have no force or effect on any other person. The parties to an arbitration may agree that in the event a patent which is the subject matter of an award is subsequently determined to be invalid or unenforceable in a judgment rendered by a court to [sic] competent jurisdiction from which no appeal can or has been taken, such award may be modified by any court of competent jurisdiction upon application by any party to the arbitration. Any such modification shall govern the rights and obligations between such parties from the date of such modification.

"(d) When an award is made by an arbitrator, the patentee, his assignee or licensee shall give notice thereof in writing to the Commissioner. There shall be a separate notice prepared for each patent involved in such proceeding. Such notice shall set forth the names and addresses of the parties, the name of the inventor, and the name of the patent owner, shall designate the number of the patent, and shall contain a copy of the award. If an award is modified by a court, the party requesting such modification shall give notice of such modification to the Commissioner. The Commissioner shall, upon receipt of either notice, enter the same in the record of the prosecution of such patent. If the required notice is not filed with the Commissioner, any party to the proceeding may provide such notice to the Commissioner.

"(e) The award shall be unenforceable until the notice required by subsection (d) is received by the Commissioner."

(2) The analysis for chapter 29 of title 35 of the United States Code is amended by adding at the end the following:

"294. Voluntary arbitration."

(c) Sections 5, 6, 8 through 12, and 17(b) of this Act shall take effect six months after enactment.

Approved August 27, 1982

For a relatively recent survey of patent attorneys' attitudes (but before §294), *see PTC Research Report* . . . . , 22 IDEA 271 (1982). Also, since this paper was written an entire issue of the A.P.L.A.J. has been devoted to the topic (vol. 11 no. 4).

and is, relatively favorable to patents, on the one hand, and arbitration, on the other.

Its meaning can be addressed in two senses: (1) The *practical* meaning, *i.e.,* why would anyone want to arbitrate a patent case even if they could? and (2) The *legal* meaning, *e.g.,* what issues can be resolved in patent arbitration? While most of this paper will deal more with legal than nonlegal considerations, it may be helpful initially to consider the utility of arbitration generally and patent arbitration specifically.

Having briefly discussed arbitration relative to other methods of resolving disputes, the paper will then discuss the history of the arbitration provision. Unfortunately, the formal legislative history is exceedingly brief. As has been seen with the '52 Patent Act in general, this can cause difficulty.[3] Fortunately, §294 is not very complex, but, then, neither is §103. However, with care and planning, §294 will prove more useful and far less troublesome.

II. ARBITRATION

Arbitration is a process of resolving a dispute by a binding third-party decision. Parties do not go to arbitration, as they would not go to litigation, if they can settle through negotiation or mediation.[4] Thus, arbitration is a supplement, not an alternative, to any process short of binding third-party determination.[5] In this way, arbitration resembles litigation. There are also other similiarities, but there are important differences.

First, the arbitrator (or arbitration panel), unlike a judge, is chosen by the parties. If there is a single arbitrator, s/he is chosen from a list provided by, *e.g.,* the American Arbitration Association (hereinafter A.A.A.). Each party ranks the list in order of preference, with the most mutually acceptable arbitrator being chosen. In the case of three-person panels, each party may pick one arbitrator with the third

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[3] *See, e.g.,* Graham v. John Deere Co., 383 U.S. 1, 14-17 (1966), discussing the legislative history of §103. *Compare* Dawson Chemical Co. v. Rohm and Haas Co., 448 U.S. 176, 202-15 (1980), discussing the legislative history of §271.

[4] "Mediation" (or "conciliation") involves a third party who attempts to facilitate efforts of the principal disputants to reach agreement. Mediators have no capacity to bind the principals to anything.

[5] For an interesting discussion of an innovative use of nonbinding third-party assistance, *see* Davis, *A New Approach to Resolving Costly Litigation,* 61 J.P.O.S. 482 (1979). Of course, that process could have predeceded either litigation or arbitration. *See also* Newman, *Pacific Industrial Property Association: Non-Binding Conciliation Between Japanese and American Companies,* 18 IDEA 91 (1977).

chosen as above, or they may choose from three lists, each of which emphasizes different expertise.[6]

Second, the arbitrator is usually an expert with reference to at least one major element of the controversy. The person need not be an attorney, particularly where the controversy can be resolved by reference to trade custom rather than formal external legal standards. Also, the person need not be an attorney where the issue is primarily factual; *e.g.*, was contract performance consistent with specifications?

Third, unlike a judge who derives authority from a constitution and statutes, an arbitrator's power is derived from expressed consent of the parties. The consent is usually expressed in a contract clause which sets forth the metes and bounds of the arbitrator's power and obligations in exercising it. If the parties were so inclined, they could insist on all of the accoutrements of a court trial, *i.e.*, Federal Rules of Civil Procedure, Federal Rules of Evidence, a written decision applying the law of a particular jurisdiction, and so forth.[7] However, an arbitration proceeding is usually far less formal, and, in fact, the A.A.A. discourages an award/decision having one word more than absolutely necessary to resolve the issue(s) presented.[8] Such awards are more difficult to challenge: if the arbitrator doesn't state findings of fact, one cannot argue whether they are "clearly erroneous" or based on "substantial evidence on the record considered as a whole." If one does not give reasons, a decision cannot be faulted as capricious and arbitrary, illogical, inconsistent with the law or the language of the contract, or whatever.[9] Nevertheless, such awards are enforced subject to fundamental process limits.[10]

Fourth, arbitration is not open to the public. No one other than

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[6] *See* A.A.A. Commercial Arbitration Rule 15(1982). *See also, e.g.*, Reilly, *The Administrative Machinery of the American Arbitration Association* 18(4) IDEA 23, 25 (1977). Finally, it bears mentioning that the A.A.A. was a set of Patent Arbitration Rules. These can be referenced in future arbitration clauses or substituted by agreement of the parties for the Commercial Rules. *See* Patent Arbitration Rules 13-15 (1983). (Hereinafter, we will assume a single arbitrator.)

[7] *See, e.g.*, Carmichael, *The Arbitration of Patent Disputes*, 38 ARB. J. 3 (1983). At 9, Mr. Carmichael sets forth sample clauses, one of which [c.] provides for discovery under the Federal Rules of Civil Procedure. *See also* note 63, *infra*.

[8] *See, e.g.*, McGovern, *The "Case" for Expanded Review of Commercial Arbitration Awards*, 18(4) IDEA 67, 77 (1977). *See also* DOMKE ON COMMERCIAL ARBITRATION §29.06 (1980).

[9] *Id. See also* Asken, note 10, *infra*, at 88-89.

[10] *See generally*, Asken, *The Case for the Status Quo*, 18(4) IDEA 81 (1977). *See also* note 36 and discussion, *infra*.

parties and witnesses need be permitted to attend.[11]

Other, sometimes cited, differences are more open to debate. There are three of these which are closely related. The first *potential* difference is time: Arbitration can be quick, if: (1) The arbitrator's schedule is not crowded; (2) S/he understands the basics of the matters in controversy without extensive educational efforts by the parties; and (3) The parties *want* it to be quick. If one party or the other wants to drag things out with, *e.g.*, challenges to jurisdiction, it will take considerable effort by the arbitrator and the other party to move the process along.[12]

The second potential difference is money: Time, of course, is money, but it is more complicated than that. On the one hand, the A.A.A. and most arbitrators charge fees.[13] On the other, there may be savings from using fewer witnesses and less attorney time in hearings, *etc.* How this may work out in a particular case is subject to some uncertainty; all things considered, arbitration is nevertheless reported to be cheaper.[14]

The final, and probably the most important difference between arbitration and litigation is the potential effect on the relationship between the parties. Litigation is often perceived as polarizing parties: *i.e.*, at the start, we have two persons with ligitimate differences of opinion; at the end, we have certified enemies. I am not sure why this is less likely to be true for arbitration. Yet good evidence of its truth is afforded by arbitration's being a fixture in contracts governing long-term relationships, *e.g.*, between unions and employers.[15] This is not to say, however, that, if you start with certified enemies, arbitration will magically turn them into friends. On the contrary, it is in

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[11] *See* A.A.A. Commercial Arbitration Rule 25(1982). This has been one of the principal concerns of opponents of patent arbitration. *See, e.g.*, Curley, *Arbitration of Patent Antitrust Disputes: Business Expediency v. Public Interest*, 18(4) IDEA 107, 110-111 (1977). *See also* Patent Arbitration Rule 25 (1983).

[12] *See, e.g.*, Reilly, note 6, *supra*, at 24.

[13] *Id.* at 26. *See also* A.A.A. Commercial Arbitration Rules 48-51 (1982), Patent Arbitration Rules 48-51 (1983).

[14] *See, e.g.*, Goldsmith, *Patent, Trademark and Copyright Arbitration Guide*, 53 J.P.O.S. 224, 238 (1971). *See also* Bowes, *Arbitration of Patent Disputes*, 18(4) IDEA 49, 50 (1977); Janicke and Borovoy, *Resolving Patent Disputes by Arbitration*, 62 J.P.O.S. 337 (1980).

[15] *See, e.g.*, Reilly, note 6, *supra*, at 24. (In the Boston region, labor cases are exceeded only slightly by uninsured motorist cases — and the two account for the overwhelming bulk of the docket.) *See also* Janicke and Borovoy, note 14, *supra*, at 359.

precisely those circumstances that arbitration may prove to be as slow and expensive as litigation.[16]

With that brief background, we can now consider the arbitration of *patent* disputes.

III. PAST: PATENT ARBITRATION PRIOR TO PASSAGE OF §294

Notwithstanding a 1930 case suggesting that patent disputes should be *per se* unarbitrable,[17] over the years they have been repeatedly resolved by arbitration. This is discussed in a widely distributed article by Harry Goldsmith. His paper is a summary report of several years of ongoing cooperation between the N.Y. Patent Law Association and the A.A.A. and is accurately entitled "Patent, Trademark and Copyright Guide."[18] Although the data was not presented by category, in 1971, Mr. Goldsmith reported that an aggregate of 40 to 50 cases were on the annual docket of the A.A.A., alone.[19]

Ironically, just about the same time that the N.Y.P.L.A. and the A.A.A. began to explore the use of arbitration in patent and related disputes and to sort out the kinds of dispute for which it was most suitable, a series of cases cast a cloud over the *patent* component of the effort. One of the most significant of these was *Beckman Instruments.*[20] Relying primarily on *Lear,* the 7th Circuit in that case held that validity was an issue inappropriate for arbitration.[21] Moreover, a subsequent decision in the D.C. Circuit held that *scope* was also inappropriate for arbitration.[22]

While some might think that this left infringement as an arbitrable issue,[23] I find it difficult to imagine a case where infringement would be seriously in question and the scope of the claims would not be. However, by the mid to late '70s, there seemed to be little basis for

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[16] Note 12, *supra. See also* Janicke and Borovoy, note 14, *supra,* at 359.

[17] Zig Mfg. Co. v. Pep Mfg. Co., 44 F.2d 184 (D.Del. 1930).

[18] Note 14, *supra.*

[19] *Id.* at 226.

[20] Beckman Instruments, Inc. v. Technical Development corp., 433 F.2d 55 (7th Cir. 1970), *cert. den.* 401 U.S. 976 (1971).

[21] *Id.* at 62-3.

[22] Hanes Corp. v. Millard, 531 F.2d 585, 593 (D.C. Cir. 1976). Nevertheless, the court, at 594 (note 7), and at 600, indicated that the district court could defer on such issues pending the outcome of arbitration on appropriate issues.

[23] Janicke and Borovoy, note 14, *supra,* is premised in part on that, *but see* note 24, *infra.*

finding patent disputes *per se* nonarbitrable.[24] Thus these later decisions did not challenge the legality of arbitration for resolving a host of other issues. Such issues can arise in almost any contract, for example, determining royalties due.[25]

About this time, the idea of arbitration also began to catch the fancy of other patent groups, including the A.B.A. Patent Section,[26] the A.P.L.A.,[27] and the Licensing Executives Society.[28] Thus a provision was included in the omnibus patent revision bill introduced in the 93d Congress.[29] That provision passed the Senate in the 94th Congress.[30]

That version of §294 expressedly permitted the arbitration of both validity and infringement. However, it was criticized by the patent bar for being limited to agreements covering *present* disputes only; in other words, it did not allow parties to a long-term contract to agree to arbitrate future disputes.[31] Another alleged shortcoming concerned an ambiguity with regard to whether an arbitrator had to consider *all* possible defenses (as listed in §282). At least one patent attorney was afraid that an arbitrator would have to consider all of those defenses regardless of whether they were raised.[32]

These and more fundamental concerns were discussed at a PTC Conference held in Boston in 1976.[33] On the one side were people basically hostile to patent arbitration and concerned about potential inhibition of competition.[34] On the other were those looking for resolution of dis-

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[24] Note 22, *supra*. Moreover Janicke and Borovoy, note 14, *supra*, at 357, concluded that what little authority there was on patent arbitration did not address the arbitrability of *present* disputes.

[25] *E.g.*, note 22.

[26] *E.g.*, HOUSE REPORT 97-542 [to accompany H.R. 6260] 13, 97th Cong. 2d Sess. (1982). *See also* A.B.A. 1982 PATENT TRADEMARK COPYRIGHT SECTION, COMM. REPS., 83, and Goldsmith, note 31, *infra*, at 31.

[27] *See, e.g., Patent Law Revision: Hearings on S.1321 Before the Subcomm. on Patents, Trademarks and Copyrights of the Senate Comm. on the Judiciary*, 93d Cong., 1st Sess., 42-71 (1973).

[28] Brenner, *Licensing Executives Society Inquiry Into Arbitration: A Discussion*, 18(4) IDEA 101 (1977). *See also* Carmichael, note 7, *supra*, at 8.

[29] S.2504 (1973).

[30] S.2255. *See* 122 CONG. REC. 4489-4530 (1976). *See also* Goldsmith, *Addendum: Patent... Arbitration Guide*, 18(4) IDEA 29, 33-5 (1977).

[31] *See* Goldsmith, *The Arbitration of Patent Disputes*, 34 ARB. J. 28, 30.

[32] *Id. See also*, Bowes, note 14, *supra*, at 52-53.

[33] *Foreword*, 18(4) IDEA (1977).

[34] Curley, note 11, *supra; also* Ransom, *Policy Issues in Using Arbitration . . . . , id. at 113*. Neither of these speakers confined themselves to antitrust issues; they were also skeptical (or worse) with regard to arbitrating patent validity.

putes by arbitrators competent to deal with technical issues.[35] As program chairman, I tried to fashion a compromise.[36] Seeing that the former seemed to be leery of hanky-panky in a nonpublic forum, I suggested that opinions be required and that they be subjected to review more intensive than that available to review other kinds of arbitration awards.[37] While this seemed to offer advantages over the use of a master,[38] the patent bar didn't like it (apparently because of the lack of finality).[39] At least I got agreement on *something:* the antitrust people didn't like it *either.*[40]

Notwithstanding this personal disappointment, I nevertheless expected to see further attention given to the topic during the Carter Administration's review of the patent system overseen by Jordan Baruch.[41] If any reference to arbitration appears therein, I have not found it. Yet that review *did* call attention to the importance of patents in spurring the innovation necessary to maintain a favorable balance of trade.[42] Moreover, it called attention to the need for more effective ways for resolving patent disputes.[43] This, of course, is central to the value of patents as incentives to innovation.[44]

Meanwhile, only a few patent disputes were being referred to arbitration.[45] While, in 1980, J.P.O.S. published an excellent account

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35 *Bowes, note 14, supra;* Brenner, note 28, *supra;* and Goldsmith, note 30, *supra. See also* Gambrell and Kimball, *Arbitration and Antitrust* . . . . , 18(4) IDEA 119 (1977).

36 Field, *Introduction,* 18(4) IDEA 1 (1977); *also* Gambrell and Kimball, note 35, *supra;* McGovern, note 8, *supra.*

37 Field, note 36, *supra,* at 3-4.

38 Why this is true, if it is, is unclear. *See, e.g.,* WRIGHT *et al.,* FEDERAL PRACTICE AND PROCEDURE: CIVIL 2d §2603 (West, 1983). *Compare* L. WHINERY, THE ROLE OF THE EXPERT IN PATENT LITIGATION, Study No. 8, Subcomm. P.T.C., Senate Comm. on the Judiciary, 89th cong., 1st Sess., 8-17 (1958).

39 Field, note 37, *supra.*

40 *Id.*

41 *See, e.g., Public Symposium on Patents,* Transcript of the final session, held at the Dept. Commerce, Jan 24, 1979 (N.T.I.S. PB 290412).

42 *See Industrial Innovation: Joint Hearing Before the Senate Comm. on Commerce, Science, and Transportation* [2 parts], 96th Cong., 1st Sess. (1979), *e.g.,* Part 1, at 51-67.

43 *Id.* Part 1, at 56.

44 To the extent that patents cannot be reliably or cost-effectively enforced, their incentive value, whatever it might otherwise be in furthering innovation, drops accordingly. *But see* note 45, *infra,* at 176.

45 In 1982, the A.A.A. reported that it was aware of only one patent arbitration involving infringement or validity in 1980, and none in 1981. *See* U.S. CONGRESS, OFFICE OF TECHNOLOGY ASSESSMENT, PATENTS AND THE COMMERCIALIZATION OF NEW TECHNOLOGY (DRAFT REPORT), 175 (June 21, 1982).

of the arbitration of a particular dispute,[46] apparently most patent attorneys were scared off by the uncertainty generated by cases such as *Beckman*.[47]

In June 1982, a draft report on the patent system was circulated by the Congressional Office of Technology Assessment.[48] It speculated that somewhere between 5,000 and 15,000 patent disputes are resolved privately each year whereas only 300 or 400 go to litigation.[49] While the vast majority of private resolutions occur as two-party settlements, this data goes far in answering those who simplistically oppose patent arbitration because of its privacy. Moreover, it was used to support a tentative endorsement of patent arbitration.[50]

It is interesting that §294, which was contained in H.R. 6260 (primarily addressing patent fees), had *already* passed the House[51] and was passed by the Senate less than two months later.[52] Shortly thereafter, it was signed by President Reagan.[53] I know neither what went on behind the scenes nor the effect that the O.T.A. effort might have had on its passage. However, as noted above, the legislative history is scant indeed. So far as I have been able to determine, it consists of a three-paragraph statement which accompanied S.2255 in the 94th

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[46] Janicke and Borovoy, note 14, *supra*.

[47] Note 45, *supra;* notes 20-22 and discussion, *supra*.

[48] Note 45, *supra*.

[49] *Id.* at 18-19.

[50] *Id.* at 28 and 173-79. At 179, it was concluded that:

> In summary, binding voluntary arbitration of patent disputes will benefit those parties that are able to agree to the proceedings and exercise discipline in the proceedings; however, potentials for abuse exist. The frequency with which voluntary arbitration will be used is subject to speculation, but because the parties must agree to the arbitration and its finality, its use is not likely to be widespread. While questions of the effect of arbitration on society exist, they are not susceptible to quantification. The policymaker can minimize any negative effects on society by requiring that issues of patentability over prior art be resolved through reexamination by the Patent and Trademark Office or by requiring the decision of the arbitrator to be placed in the public record of the patent.

There is, of course, nothing "official" about this draft report. So far as I have been able to determine, the whole effort was aborted and, unfortunately, no "final" report ever issued.

[51] On June 8; *see* 128 CONG. REC. H3203-206.

[52] On August 12; *see* 128 CONG. REC. S10293-294.

[53] On Aug. 27, 1982; note 2, *supra*.

Congress[54] and brief remarks in the House Report accompanying H.R.6260.[55] While the latter does not discuss the differences between this provision and the one which had previously passed the Senate (and, indeed, does not seem to recognize their existence),[56] the significance of the changes seems straightforward. This is particularly true in view of the published criticisms discussed above.

IV. PRESENT: NONDEBATABLE ASPECTS OF §294

Section 294 removes all of the uncertainty about patent arbitration with regard to several key issues and most of it with regard to a couple of others.

A. *Patent Arbitration Is Governed By Title 9*

Subsection (b) recites that:

> Arbitration of [patent] disputes, awards . . ., and confirmation of awards shall be governed by title 9, United States Code, to the extent that it is not inconsistent with this section.

The major way in which title 9 might be inconsistent with §294 is probably the requirement for recording awards with the P.T.O.[57] However, given the contents of §290, this is not surprising.[58] The major effect of subsection (b) would, thus, seem to be one of foreclosing efforts to *require* patent arbitration to be conducted differently or reviewed differently from any other arbitrable subject matter.[59]

B. *Ordinary Contract Issues Are Arbitrable*

It is interesting that §294 clearly states that validity and infringement may be arbitrated but makes no mention of ordinary contract issues. Notwithstanding the 1930 case to the contrary,[60] no one has seriously questioned their arbitrability in recent years.[61] Indeed,

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[54] *Patent Law Revision,* S. REP. NO. 94-642 (to accompany S.2255), 94th Cong., 1st Sess., at 42 (1976).

[55] *Patent and Trademark Authorization,* H.R.REP. NO. 97-542 (to accompany H.R.6260), 97th Cong., 2d Sess., at 12-13 (1982).

[56] *Id.* Although the report cites S.2504 (note 29, *supra*), there is no reference to S.2255 (note 30, *supra*) and no suggestion that this provision differs from those (which *were* identical).

[57] *See* subsections (d) and (e), note 2, *supra.*

[58] It requires clerks of U.S. courts to notice the P.T.O. with reference to complaints filed and judgments/decisions rendered. It also obligates the Commissioner to enter such notices in the files of the patents in controversy.

[59] Notes 33-40 and discussion, *supra. See also* note 50, *supra.*

[60] Note 17, *supra.*

[61] *See, e.g.,* Curley, note 11, *supra,* at 111-12; Ransom, *id.* at 118.

several of the decisions casting doubts on the arbitration of validity or scope actually held ordinary contract matters to be proper for arbitration.[62] Thus, it is clear that one can agree to arbitrate any questions which might arise about amounts of royalty due, rights to inspect books, or whatever.[63]

C. *Future Disputes Are Covered*

While as mentioned above, earlier versions of §294 permitted the arbitration of existing disputes only, subsection (a), as enacted, also permits the inclusion of arbitration provisions in ongoing contracts. Although some patent attorneys have questioned the wisdom of agreeing in advance to arbitration,[64] experience will no doubt show ways to avoid problems.[65] Yet, it is now clear that parties have the freedom to contract to resolve future validity and infringement problems as well as basic contract issues.

D. *Defenses In General*

In still another respect, §294 is an improvement over its predecessor. Subsection (b) recites that defenses shall be considered by the arbitrator *if* raised by a party. The earlier version lacked that condition and created the possibility that all defenses[66] would have to be examined regardless of being raised. While this may seem silly, it is better that the issue has been straightforwardly put to rest.[67]

V. FUTURE: COLLATERAL EFFECTS, REMEDIES, AND MISCELLANEOUS ISSUES

Notwithstanding that subsection (c) states that an award shall have no force or effect on a nonparty, legal uncertainties remain with regard to collateral effects and remedies. No doubt there will be other issues not yet spotted.

A. *Validity*

Consider the collateral effects of a validity determination for example. Should an arbitrator hold one or more claims invalid or implicitly

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[62] *E.g,* note 22, *supra.*

[63] *But see* Levin v. Ripple Twist Mills, Inc., 416 F.Supp. 876, 880-81 (D.E.D. Pa. 1976). *See also* note 7, *supra.*

[64] *See, e.g., Arbitration and Patent Problems,* 21 ARB. J. 98, 111 (1966). However, one will want to avoid having ordinary contract issues of all within the jurisdiction of states which do not recognize the validity of future disputes clauses. *See, e.g.,* Janicke and Rirovoy, note 14 *supra,* at 352-53.

[65] *E.g.,* note 7, *supra. Compare Levin,* note 63, *supra.*

[66] Bowes, note 14, *supra,* at 52-53.

[67] Note 2, *supra.*

reduce their scope by a finding of noninfringement, it is hard to believe that this will not work to the advantage of third parties. Indeed, any attempt to enforce a claim invalidated during arbitration would create a risk of serious problems.[68]

Conversely, if the patentee wins, one would expect an attempt to introduce the award into evidence in subsequent action against other infringers. Granted, that the determination would not be *binding,* if the art were the same, it would seem to be material and relevant in strengthening the §282 presumption.[69] However, this remains to be decided by the Court of Appeals for the Federal Circuit.[70]

Yet at a purely practical level, if arbitrators are respected, their awards, alone, might serve to deter challenges to validity.

Three questions remain, however. First, assuming that the patentee prevails, would an *opinion* by the arbitrator strengthen his position with regard to subsequent potential challenges, or would it merely open the award up to reversal?[71] The answer to that question also awaits decision by the new Court of Appeals.

The second question is whether a patentee would get more benefits from having questions of validity resolved by reexamination before the P.T.O.[72] Any answer ventured here may be wildly speculative. However, it is clear that reexamination suffers from some serious defects.[73]

The third question concerns fraud on the Patent Office. If the patent survives arbitration, fraud would seem to vanish as a threat. Yet if one or more claims are invalidated, there may be a risk that fraud will be asserted. This is one area where I, for one, would opt for a written arbitrator's opinion.[74] Assuming no fraud, I would hope that an expert discussion of the art would reduce this risk. Moreover, whether the discussion came from the P.T.O. or an arbitrator, at least there would be something to be *admitted* regardless of whether or not it was binding in subsequent action.[75]

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[68] Not only would it risk antitrust litigation, *but see also,* Stevenson v. Sears, Roebuck & Co., 713 F.2d 705, 712-13 (Fed. Cir. 1983). *However compare* note 45, *supra,* at 178-79.

[69] *See,* note 7, *supra,* at 7-8.

[70] *See, e.g.,* Pravel, *How Will the Court of Appeals for the Federal Circuit Review the Evidence in a Patent Infringement Suit?,* 65 J.P.O.S. 32 (1983).

[71] *See* note 45, *supra,* at 179; Davis, note 5, *supra;* note 8, *supra;* note 10, *supra.*

[72] Note 45, *supra,* at 178-79.

[73] *See, e.g.,* 1983 A.P.L.A. BULLETIN 389-91, 435-37.

[74] *Compare* note 71 and discussion, *supra.*

[75] *See generally,* Digital Equipment Corp. v. Diamond, 653 F.2d 701 (1st Cir. 1981).

B. *Misuse*

Misuse is an even more difficult issue with potential collateral effects as between the *same* parties. However, before collateral effects can occur, misuse has to be determined to be a defense coming within §282(4) as an "other fact or act made a defense *by this title.*"[76]

Assuming that misuse can be brought in, *e.g.*, because of its discussion in §271(d),[77] what effect might this have on a subsequent antitrust suit by the infringer? On the one hand, the arbitrator might find a patent valid and infringed, awarding damages in spite of an asserted misuse defense. On the other s/he might find the patent valid, infringed and misused. Either way, a patentee may nevertheless be put to the expense of defending an antitrust suit. To hold that a finding of no misuse would bar an antitrust suit between the parties is to make antitrust issues arbitrable. Certainly there is no basis in the legislative history of §294 for such a holding.[78] Moreover, unlike fraud, which is inherently related to validity and often is resolved by resort to technical expertise, an opinion on misuse, even if admissible, may not be likely to carry as much weight.[79]

Given this situation, parties might consider explicitly excluding misuse from the arbitrator's jurisdiction or avoid getting into arbitration in circumstances where a misuse defense is an above-average possibility.[80]

C. *Remedies*

Although the problem is not as complex as those just discussed, some mention of remedies seems necessary. Section 294 makes no mention of remedies. Does this mean that arbitrators are limited to traditional remedies,[81] or do they have the power, *e.g.*, to award treble

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[76] Carmichael, note 7, *supra,* at 7, appears to believe that such issues do fall within that provision.

[77] *See generally, Dawson,* note 3, *supra.*

[78] There is little sentiment anywhere for antitrust issues being arbitrable; *see* Gambrell and Kimball, note 35, *supra.* Rather there is considrable opinion to the contrary; *see, e.g.,* Curley, note 11, *supra;* Ransom, *id.* at 113.

[79] Unless perhaps the arbitrator were a retired trial judge with experience in antitrust litigation. For a general discussion of the relationship between misuse and antitrust, *see* Lowin, *Whether Patented or Unpatented . . . .*, 23 IDEA 77 (1982) — particularly at 103.

[80] Perhaps this will not occur as a matter of course insofar as attorneys seem reluctant to arbitrate cases where there is a great deal at stake. *See PTC Research Report,* note 2, *supra; see also* note 45, *supra,* at 176.

[81] *See* A.A.A. Commercial Arbitration Rule 43(1982). Patent Arbitration Rule 43 (1983) explicitly confers power to enjoin infringement. Without more, the arbitrator seems to have more latitude than an American judge.

damages[82] and/or attorney fees?[83] The latter seems more in accord with §294, for to hold otherwise might be a counter incentive to use arbitration and be at odds with the thrust of that section (insofar as can be determined from its scant history). Assuming that the parties have the capacity to resolve the issue between themselves, it would be a good idea to address the issue in the contract.

D. *Miscellaneous Issues and Conclusion*

One would have to be an optimist, indeed, not to anticipate still other unresolved issues. However, the patent bar should take heart from having a single appellate court with jurisdiction over most of them.[84]

Not only is it a court with judges having an excellent grasp of patent law and policy, but it is also in a unique position to guide and encourage the development of arbitration as an alternative to patent litigation. Moreover where, as with validity, there are three, rather than two, options, it is in a position to coordinate their use.[85]

Thus, notwithstanding a few loose ends, patent disputes are susceptible to quicker, cheaper, and, most importantly, more predictable resolution than ever before. If this does not strengthen the patent system, our bar will have to look to itself for the cause.

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[82] 35 U.S.C. §284.

[83] 35 U.S.C. §285. *See also Stevenson,* note 68, *supra.*

[84] Apparently including antitrust disputes when linked with a substantial patent dispute. *See* 28 U.S.C. §1295. *Compare* S.REP. NO. 97-275, 97th Cong., 2d Sess., 19, *reprinted in* [1982] U.S. CODE CONG. & AD. NEWS, 29.

[85] Deciding, for example, under what circumstances a stay of one would be appropriate pending resolution of an issue by another. *See, e.g.,* notes 22 and 63, *supra.*

STATUTORY DAMAGES AND RIGHT TO JURY TRIAL IN COPYRIGHT INFRINGEMENT SUITS

WENDY K. BREUNINGER*

Even though intellectual property lawyers hoped the Copyright Act of 1976[1] would remove the ambiguities of the Copyright Act of 1909,[2] some vague language was carried over into the new Act. One section which remains vague concerns the right to jury trial in cases where statutory damages are requested. That section, §504(c) of the Copyright Act of 1976,[3] like its predecessor, §101(b) of the Copyright Act of 1909, does not clearly state whether the right to jury trial exists for parties in copyright infringement suits where an injunction and/or statutory damages is the requested remedy. Since the Copyright Act of 1909 was passed, the courts have been divided in their interpretations of the statute. Some courts upheld the right to jury trial in these suits,[4] while some courts denied the right jury trial in these suits.[5]

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*Juris Doctor, Franklin Pierce Law Center, 1983.

[1] P.L. 94-554, Title 17, U.S.C.S. Secs. 101 et seq.

[2] Title 17, U.S.C. Secs. 1 et seq.

[3] 17 U.S.C. 504(c) reads, "infringer is liable in a sum of not less than $250 or more than $10,000 as the court considers just." The portion "as the court considers just" causes considerable difficulty. The 1976 version comes from section 101(b) of the 1909 Act which stated that a "party may sue for an injunction restraining the infringement, and for such damages as the copyright proprietor may have suffered due to the infringement as well as all the profits which the infringer shall have made from such infringement. In lieu of actual damages, the copyright holder may sue for an injunction and such damages as to the court shall appear to be just."

[4] Gnossos Music v. Mitken, Inc., 211 U.S.P.Q. 841 (4th Cir. 1981); Broadcast Music, Inc. v. Moor-Law, Inc., 203 U.S.P.Q. 487 (D.Del. 1978).

[5] Twentieth Century Music Corp. v. Firth, 645 F.2d 6 (5th Cir. 1981); Rodgers v. Breckenridge Hotels Corp., 512 F.Supp. 1326 (E.D. Mo. 1981); Glazier v. First Media Corp. 532 F.Supp. 63 (D.Del. 1982), Broadcast Music, Inc. v. Dici Nazi Velleggia, Inc., 490 F.Supp. 1342 (DC Md. 1980).

The diverging interpretations of §504(c) of the Copyright Act of 1976 may result from the fact that Congress offered no concrete guidance in the related reports and comments that discussed §504(c) and its predecessor §101(b).

I. Legislative History

The House and Senate both wrote general reports on the Copyright Act of 1976, but these reports were not specific enough to clarify every section of the revised Act. The House Report[6] regarding the Copyright Act of 1976, §504(c) stated only that "one of the purposes of the section was to provide the court with reasonable latitude to adjust recovery to the circumstances of the case".[7] Unfortunately the House Report failed to go any further, and made no comment as to whether awards of statutory damages are to be made by a judge or by a jury. The House Report referred only to "the court" without distinguishing between "the court" as judge or "the court" as jury.[8] The Senate Report[9] added nothing to the House Report. The intent of Congress regarding this section remains unclear from the legislative record.

II. Cases Decided Under the Copyright Act of 1909

Cases interpreting §101(b) of the Copyright Act of 1909 are divided as to the meaning of section §101(b) of the statute. Some courts held that the section provides an equitable remedy which does not require the right to jury trial.[10] Other courts held that the section prescribes a legal remedy which requires the court to guarantee parties the right to jury trial..[11]

1. *Courts Finding No Right To Jury Trial*

Three courts held that no right to jury trial existed in actions

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[6] H.R. 1476, 94th Cong., 2nd Sess. 161 (1976).

[7] H.R. 1476, 94th Cong., 2nd Sess. 161 (1976).

[8] See, H.R. 1476, 94th Cong., 2nd Sess. 162-163, which reads in part: "As a general rule, where the plaintiff elects to recover statutory damages, the court is obligated to award between $250 and $10,000. It can exercise discretion in awarding an amount within that range . . . "

[9] S. 473, 94th Cong., 1st Sess. 143-145 (1975).

[10] Broadcast Music, Inc. v. Papa John's Inc., 201 U.S.P.Q. 302, (N.D.Ind. 1979), hereinafter referred to as BMI (1979); Caymen Music, Ltd. v. Reichenberger, 403 F.Supp. 794 (W.D.Wis. 1975), hereinafter referred to as Caymen; Boradcast Music, Inc. v. Dici Naz Velleggia, Inc., 490 F.Supp. 1342 (D.Md. 1980); Sid & Marty Krofft Television v. McDonald's Corp., 562 F.2d 1157 (9th Cir. 1977).

[11] Chappell and Co., Inc. v. Pumpernickel Pub., Inc., 79 F.R.D. 528 (D.Conn. 1977); and Chappell and Co. v. Cavalier Cafe, Inc., 13 F.R.D. 321 (D.Mass. 1952).

where a request was made for an injunction and statutory damages. Two of the three courts considered similar fact patterns: the District Court for the Northern District of Indiana in *Broadcast Music, Inc. v. Papa John's, Inc.*,[12] hereinafter referred to as BMI (1979), and the District Court for the Western District of Wisconsin in *Caymen Music, Ltd. v. Reichenberger*,[13] hereinafter referred to as *Caymen*.

In *BMI* (1979), plaintiffs alleged that the defendant caused the unauthorized public performance for profit of certain copyrighted musical compositions. For each cause of action, plaintiffs sought a permanent injunction restraining the defendant from further infringements, minimum statutory damages, costs, and reasonable attorney's fees.[14] As in *BMI* (1979), plaintiffs in *Caymen* alleged that defendant infringed plaintiffs' copyright by giving public performances for profit of the copyrighted composition. As in *BMI* (1979), plaintiffs in *Caymen* sought injunctive relief, statutory damages, and costs,[15] however, plaintiffs in *Caymen* did not request attorney's fees.

Both *BMI* (1979) and *Caymen* focused on the infringement of plaintiffs' copyrighted music. In each case, the alleged acts of infringement occurred in bars or pub-like settings where the copyrighted music was performed without the copyright owners' permission. In both cases, the defendants responded to the complaints with requests for jury trials. In deciding the motions, both courts held that when an injunction is coupled to a request for statutory damages the remedy should be characterized as equitable, with no coupling of legal and equitable issues occurring, referencing *Beacon Theaters, Inc. v. Westover*.[16] Since both courts saw the overall remedy as equitable, both courts denied defendants' motions for jury trial.

Though the fact pattern and the result of each case were identical, the reasons differed for each court's decision. The court in *BMI* (1979) found that the statutory damage issue was too complex for a jury to decide.[17] In addition, the court found that the decision required "discretion" and that "juries normally do not exercise discretion."[18] In contrast to *BMI* (1979), the court in *Caymen* made three points, (1) the

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[12] Ibid.

[13] Ibid.

[14] BMI, 201 U.S.P.Q. 302, 303, (N.D. Ind. 1979).

[15] Caymen (1979), 403 F.Supp. 794, 795 (W.D. Wis. 1975).

[16] Beacon Theaters, Inc. v. Westover, 359 U.S. 500, 79 S.Ct. 948 (1959).

[17] BMI (1979) 201 U.S.P.Q. 302, 304. (N.D. Ind. 1979). The court added that, "neither the pre-merger custom nor the practical limitations of juries appear to provide a determinative answer in the present case."

[18] *Id.* at 306.

statutory scheme leaves nothing for a jury to decide (it is simply a mechanical task that should be decided by a judge); (2) the pre-merger history of these cases indicates that suits for injunctive relief and just damages are suits in equity; and (3) statutory damages are neither penal nor compensatory, hence must be equitable. The *Caymen* court relied on the tri-parte analysis of *Ross v. Bernhard,* 306 U.S. 531, 538 (1970) in determining that the matter was equitable.

The third case decided under the Copyright Act of 1909 which denied parties a right to jury trial when requesting statutory damages, was *Sid & Marty Krofft Television v. McDonalds Corp.*[19] In that case, an action was brought by the producers of "H.R. Pufnstuf" children's TV shows against the producers of "McDonaldland" TV commercials. The district court for the central district of California entered judgment for plaintiffs and assessed damages of $50,000.00. After the verdict, the parties briefed the question of whether plaintiffs were entitled to additional money recovery in the form of profits or statutory "in lieu" damages. The district court denied the request for additional money recovery. On appeal, the ninth circuit held that if either profits or actual damages or both are ascertained, the court in its discretion may award statutory "in lieu" damages, but if neither profits nor actual damages are ascertained, an award of "in lieu" damages is mandatory, though the amount remains discretionary. In his concurring opinion, Judge Sneed said that an "in lieu" damages request should not be presented to a jury. Thus, the ninth circuit found no right to jury trial in cases where statutory damages were requested.

These three cases reveal a variety of reasons for finding no right to jury trial in copyright infringement suits where an injunction and/or statutory damages are requested. However, an equal number of reasons exist wherein courts preserved the right to jury trial in cases that involve the remedies of the Copyright Act of 1909, 17 U.S.C. 101(b) (1909).

2. *Courts Guaranteeing the Right to Jury Trial*

Both *Chappell & Co., Inc. v. Pumpernickel Pub., Inc.,*[20] and *Chappell & Co. v. Cavalier Cafe, Inc.,*[21] recite that a demand for jury trial should be allowed in suits for copyright infringement where statutory damages are requested "in lieu of" actual damages.

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[19] Sid & Marty Krofft Television v. McDonalds Corp. 562 F.2d 1157 (9th Cir. 1977).

[20] Chappell & Co., Inc. v. Pumpernickel Pub., Inc., 79 F.R.D. 528 (D.Conn. 1977).

[21] Chappell & Co. v. Cavalier Cafe, Inc., 249 F.2d 77 (1st Cir. 1957).

Chappell & Co. v. Cavalier Cafe, Inc.[22] involved an action charging the defendant with infringement, by a public performance for profit, of a musical composition. Plaintiff requested that the defendant be enjoined from publicly performing the compositions and that statutory damages be awarded.

The district court found that the damages sought "cannot properly be considered as merely incidental to the equitable relief demanded."[23] Instead, the court said these damages were:

> peculiar to copyright cases. Insofar as they are recoverable solely by virtue of statutory provisions, they are analogous to the treble damages provided for in other statutes. An action to recover such damages is one which under common law pleadings would have been considered an action of debt upon a statute. Claims for such statutory treble damages have repeatedly been held to be triable by jury, even when joined in the same complaint with claims for equitable relief provided for by other parts of the same statute." *Orenstein v. United States,*[24] *United States v. Strymish,*[25] *Ring v. Spina,*[26] *Sablowsky v. Paramount Film Distributing Corp.*[27] There is no reason why the same rule should not govern claims for damages which are the special creation of the copyright statutes.[28]

The district court found that since the statutory damages in question were comparable to an action in debt, an action legal rather than equitable in nature, then, as a legal remedy, the Seventh Amendment right to a jury trial should be guaranteed.

In the newer case, *Chappell & Co., Inc. v. The Pumpernickel Pub., Inc.,*[29] the district court relied on the older *Chappell* case and reiterated its earlier position, that statutory damages are analogous to actions in debt.[30]

The newer *Chappell* case was factually similar to the older case. The plaintiff sued for statutory damages "in lieu" of actual damages for infringement of a musical copyright. As in the older case, the plaintiff characterized the suit as one similar to an action in debt. Judge Newman used the older case as precedent and then proceeded to elaborate on the ability of a jury to decide on statutory damages. He said:

> Surely a jury is capable of awarding statutory minimum damages, for that is far easier than assessing actual damages. Moreover, the underlying fac-

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[22] Chappell & Co. v. Cavalier Cafe, Inc., 249 F.2d 77 (1st Cir. 1957).

[23] Chappell & Co. v. Cavalier Cafe, Inc., 13 F.R.D. 321, 322 (D. Mass. 1952).

[24] Orenstein v. U.S. 191 F.2d 184 (1st Cir. 1951).

[25] U.S. v. Strymish, 86 F.Supp. 999 (D.C.D. Mass. 1949).

[26] Ring v. Spina, 166 F.2d 546 (2nd Cir.).

[27] Sablowsky v. Paramount Film Distributing Corp., 13 F.R.D. 1381 (DCDC).

[28] Chappell & Co. v. Cavalier Cafe, Inc., 13 F.R.D. 321, 322 (D. Mass. 1952).

[29] Chappell & Co., Inc. v. The Pumpernickel, Pub., Inc., 79 F.R.D. 528 (D. Conn. 1977).

[30] Leimer v. Woods, 196 F.2d 828 (8th Cir. 1952).

> tual issue of whether there was infringement is within jury competence. The issue of infringement is tried to a jury when actual damages are sought and is no less entitled to jury consideration when the claim is for statutory minimum damages.[31]

The five cases described above demonstrate that diverging interpretations remain regarding the right to jury trial when statutory damages are requested. With the passage and enactment of the Copyright Act of 1976 these interpretations have been expanded on and modified. The two patterns of thinking, each at odds with the other, are progressively getting even more divergent.

III. Cases Determined Under the Copyright Act of 1976.

No Supreme Court decision has been rendered stating whether the statutory damages remedy of the Copyright Act of 1976 can be characterized as legal or equitable. However, two circuit courts have addressed the issue and each has rendered a different opinion on the right to jury trial. The Fifth Circuit, in *Twentieth Century Music Corp. v. Firth,*[32] held that statutory damages were equitable in nature. The Fourth Circuit, in *Gnossos Music v. Mitken, Inc.,*[33] held that the statutory damages remedy was legal in nature. In addition to the circuit court opinions, four district courts also addressed this issue and also were divided in their opinions regarding the right to jury trial when statutory damages are requested.

1. *Four Courts Finding No Right to Jury Trial Under The Copyright Act of 1976, 17 U.S.C. (504) (c).*

The first case, *Twentieth Century Music Corp. v. Firth,*[34] consolidated three actions which alleged a total of thirteen copyright infringements of musical compositions. The infringements occurred through public performance, for profit, at the Juwan Knight Club, of Columbus, Georgia during a one year period. Appellant owned and managed the club where the musical compositions were performed. Appellees owned the copyrights on the music performed. Appellant Firth requested a jury trial and the motion was denied by the District Court. Without discussion, the Fifth Circuit said, "The whole case before the Court is equitable in nature";[35] as an equitable matter, no jury trial was required. The Fifth Circuit simply cited *BMI* (1979) and

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[31] Chappell & Co. v. Pumpernickel Pub., Inc., 79 F.R.D. 528, 530 (D. Conn. 1977).

[32] Twentieth Century Music Corp. v. Firth, 645 F.2d 6 (1981).

[33] Gnossos Music v. Mitkin, Inc. 211 U.S.P.Q. 841 (1981).

[34] Twentieth Century Music Corp. v. Firth, 645 F.2d 6, 7 (5th Cir. 1981).

[35] Ibid.

Caymen as the foundation for its holding. It found these cases, decided under the Copyright Act of 1909, adequate precedent.

The second case, *Broadcast Music Inc. v. Dici Naz Valleggia, Inc.*[36] was an action for copyright infringement wherein plaintiff alleged eleven claims of infringement and sought an injunction, statutory damages, costs and attorneys fees. Defendant moved for a jury trial. The court denied the motion citing two Supreme Court decisions on the general subject. The court wrote:

> The Seventh Amendment does apply to actions enforcing statutory rights, and requires a jury trial upon demand, if the statute creates legal rights and remedies, enforceable in an action for damages in the ordinary courts of law. *Curtis v. Loether.*[37]

It added:

> This statement suggests two tests which should be utilized in determining whether an action based on federal statute entails a constitutional right to a jury trial. *First,* are the rights and duties created by the statute analogous to rights and duties historically comprehended by the common law? *Second,* are the remedies sought legal rather than equitable in nature? (See also *Ross v. Bernhard,*[38] *Pons v. Lorillard*[39]).

The District Court for Maryland concluded that the rights and duties by the statute *were not analogous* to rights and duties historically comprehended by the common law and that the relief sought in the case was essentially equitable.[40]

The third case, *Rodgers v. Breckenridge Hotels Corp.,*[41] involved a suit for copyright infringement of musical compositions. Here, the infringements occurred when the defendant publicly performed plaintiff's copyrighted music. The plaintiff requested injunctive relief, costs and attorneys fees. Like the Fifth Circuit, Judge Nangle found that statutory damages traditionally have been considered equitable on the basis of *BMI* (1979), *Caymen,* and *BMI* (1980). In denying the request for jury trial, he wrote, "the very language of this section [504(c)] suggests equitable relief. The Court is to exercise its discretion in determining what is just."[42]

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[36] Broadcast Music Inc. v. Dici Naz Velleggia, 490 F.Supp. 1342, (D.C. Md. 1980) hereinafter referred to as (BMI, 1980).

[37] Curtis v. Loether, 415 U.S. 180, 194, 94 S.Ct. 1005, 1008 (1974).

[38] Ross v. Bernhard, 396 U.S. 531, 90 S.Ct. 733 (1970).

[39] Pons v. Lorillard, 549 F.2d 950 (4 Cir. 1977) rev'd on non-constitutional grounds, 434 U.S. 575, 98 S.Ct. 866, (1978).

[40] BMI (1980) at 1343.

[41] Rodgers v. Breckenridge Hotels Corp., 512 F.Supp. 1326, 1327 (ED.Mo. 1981).

[42] Ibid, 1327.

The fourth case, *Glazier v. First Media Corp.*[43], concerned a claim of copyright infringement and a prayer for an injunction, profits, damages, statutory damages, costs and attorneys fees. Unlike the Fifth Circuit, Judge Steel went a step further and analyzed the legislative history of the Copyright Act of 1976 in regard to this issue. He found the legislative history wanting for a clear statement on the nature of statutory damages. He then proceeded to analyze similar cases decided under the Copyright Act of 1909 and the Copyright Act of 1976. He held, "the determination of statutory damages under the Copyright Act presented an equitable issue and is to be determined by the Court."[44]

In his analysis of the current cases involving requests for statutory damages, Judge Steel discussed *Gnossos Music v. Mitken, Inc.*[45] He determined that the decision in *Gnossos Music v. Mitken* was erroneously based on interpretations of *Barber v. Kimbrell's Inc.*,[46] and *Curtis v. Loether.*[47] He found that neither *Barber,* or *Loether,* applied in this situation.[48] He suggested that, even though both cases stood for the principle that certain statutory damages are legal and not equitable, an analogy, as such, could not be correctly drawn for copyrights. Judge Steel found the analogies drawn in *Gnossos Music* went too far and that statutory damages should not be included in the same category with actual and punitive damages. He found that a jury should render a verdict on the amount of actual damages and punitive damages, but statutory damages in copyright actions should be left to a judge.[49]

2. *Courts Finding a Right to Jury Trial Under the Copyright Act of 1976, 17 U.S.C. 504(c)*

Two cases, which involved a request for statutory damages, upheld the right to jury trial for copyright infringement suits. Those cases

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[43] Glazier v. First Media Corp., 532 F.Supp. 63 (D.Del. 1982).

[44] Ibid, at 64.

[45] Gnossos Music v. Mitken, Inc., 211 U.S.P.Q. 841 (4th Cir. 1981).

[46] Barber v. Kimbrell's Inc. 577 F.2d 216 (4th Cir., *cert. denied* 439 U.S. 934 (1978).

[47] Curtis v. Loether, 415 U.S. 180, 189 (1974).

[48] Loether concerned Title VIII of the Fair Housing Provisions Act which provided "the court" may grant injunctive relief and "award to the plaintiff actual damages and not more than $1000 punative damages." The U.S. Supreme Court held that the language of Title VIII indicated a jury trial was required. In Gnossos Music the court took this rule and went a step further to include in the category of actual and punitive damages, minimum statutory damages.

[49] Glazier v. First Media Corp., 532 F.Supp. 63 (D.Del. 1982).

[50] Gnossos Music v. Mitkin, Inc., 211 U.S.P.Q. 841 (4th Cir. 1981).

were: *Gnossos Music v. Mitkin, Inc.*[50] 211 U.S.P.Q. 841 (4th Cir. 1981) and *Broadcast Music, Inc. v. Moor-Law, Inc.*[51]

In *Gnossos Music,* eight owners of copyrights brought suit for seven instances of copyright infringement of their musical compositions. The infringements occurred when the copyrighted music was publicly performed for profit. The defendant was the owner and operator of a night club in Asheville, North Carolina, called "The Cosmic Ball Room," which regularly presented live music for dancing. After the complaint was filed, defendant moved for a jury trial. The District Court denied the motion for jury trial and found for the plaintiff on five of the seven counts of infringement.

The appeal concerned the denial of the motion for jury trial. The opinion by the Fourth Circuit began with a finding that the language of the statute was ambiguous as to the definition of "the court." To solve the ambiguity, this court examined two cases in which courts were faced with a similar problem: that of defining the phrase "the court" when used in a statute. The two cases relied on were *Curtis v. Loether,*[52] and *Barber v. Kimbrell's Inc.*[53] In each case the court held, "Congress meant the determination [of the phrase, "the court"] should be made by a jury."[54] Taking these determinations in hand, the Fourth Circuit first found the phrase "the court" to mean "the jury" in actions for statutory damages.

Next, the Fourth Circuit found that the Copyright Act of 1976 created a new legal duty, but that the recovery for breach of the duty is analogous to a number of tort actions.[55] It held that the "overall characterization" of the Act, as "legal" should govern and hence "504(c) is basically an action for the enforcement of a legal right."[56]

Finally, the court found the nature of statutory damages to be traditionally legal. It cited the *Chappel* case as precedent for this conclusion.

This three part rationale led the court in *Gnossos Music* to determine that the Copyright Act of 1976, 17 U.S.C. 504(c) invoked a right to jury trial.

The second case unholding a right to jury trial was *Broadcast Music,*

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[51] Broadcast Music, Inc. v. Moor-Law, Inc. 203 U.S.P.Q. 487 (D.Del. 1978).

[52] Curtis v. Loether, 415 U.S.189 (1974).

[53] Barber v. Kimbrell's Inc., 577 F.2d 216 (4th Cir., *cert. denied* 439 U.S. 934 (1978).

[54] Gnossos Music v. Mitkin, Inc., 211 U.S.P.Q. 841, 842 (4th Cir. 1981).

[55] Id., 843. *See,* Screen Gems-Columbia Music, Inc. v. Metlis & Lebow Corp., 453 F.2d 552, 172 U.S.P.Q. 261 (2d Cir. 1972); and Ted Browne Music Co. v. Fowler, 290 F.2d 751 (2d Cir. 1923).

[56] Gnossos Music, at 843.

Inc. v. Moor-Law, Inc.[57] As in *Gnossos Music,* the plaintiffs alleged that copyrighted songs were played for profit without a license in defendants' establishment, here, "The Triple Nickel Saloon." Plaintiffs sought as relief, an injunction and statutory damages. The Court held that if plaintiffs seek the legal remedy of damages under 17 U.S.C. 504(c), then such a request must be submitted to a jury. District Judge Stapleton allowed the defendant's request for jury trial, relying on *Dairy Queen v. Wood.*[58]

IV. Conclusion

The district courts and the circuit courts are not in agreement on whether the right to jury trial exists when statutory damages are the requested relief in a suit for copyright infringement. In the past two years, one court, the District Court of Delaware, initially upheld the right to jury trial and more recently, denied the right to jury trial in separate suits for copyright infringement in which statutory damages were the requested remedy.

As a result, the issue remains unclear whether or not a right to jury trial exists in cases that request statutory damages. The language of the statute is ambiguous, the legislative history regarding the intent of Congress is sketchy and vague, and the cases as decided under the analogous provision in the Copyright Act of 1909 are equally indeterminate. The current case law is developing in two separate patterns at complete odds with each other. As such, the matter is ripe for the Supreme Court to resolve.[59]

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[57] Broadcast Music, Inc. v. Moor-Law, Inc., 203 U.S.P.Q. 487 (D.Del. 1978).

[58] Dairy Queen, Inc. v. Wood, 369 U.S. 469, 133 U.S.P.Q. 294 (1962).

[59] For additional discussion of this matter, See, William Patry, "The Right to a Jury in Copyright cases," 29 Journal of the Copyright Society, 139 (1981).