POSITIVE EXAMINATION

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ABSTRACT

In the U.S. patent system, when an applicant makes an application for patent the public must assess the merits of investing, by granting a patent, in an allegedly new, useful, and unobvious invention. Assessing whether a new property right should be granted has costs. Chief among those is the cost of obtaining and understanding information that defines the property to which the applicant seeks to stake a claim.

An examination of the systemic importance of information necessary for defining the topography and contours, *i.e.*, the boundaries, of patented property reveals that such information is fundamental to the proper functioning of the patent system. Indeed, the question, "What *is* the thing that is patented?" is perhaps the single most important inquiry in patent law. For example, the cost of obtaining and understanding information that defines the boundaries of the property sought must be paid as a prerequisite to the decision making that underlies the patent grant, to the determination that certain conduct is unlawful, and in substantive cases, to the determination that a patent should not have issued. Moreover, when the boundaries of the property are not well-defined, the resulting uncertainty causes cost inefficiencies that are felt by all of the participants in the patent system, *i.e.*, the Patent Office, the patent applicant (and later patentee), patent assignees or licensees, actual or potential competitors, courts, and every member of the public at large.

Because of its institutional role as *ex ante* arbiter of whether a patent should issue, the Patent Office plays an important role in the systemic allocation of the information costs associated with ascertaining the boundaries of patented property. Applying the theoretical assumption that reducing the systemic cost of information necessary to construct an understanding of the boundaries of

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patented property will result in a patent system of greater utility; this article sets forth a proposal. It is implemented by the simple positive rule that early in the process of examination, the examiner should commit to the administrative record the examiner's understanding of the boundaries of the property right. The examiner's understanding of the boundaries, however, will not become binding unless the patent applicant ratifies it. Rather, the examiner's definition of the boundaries of the property serves as a framework from which the patent applicant can provide specifically targeted information necessary to build a record of those attributes, or data points, that define the boundaries of the property. This procedural change shifts some of the informational cost from higher cost providers, *i.e.*, the Patent Office and post-grant participants, and moves it to the patent applicant, the party best positioned to most cheaply provide such information. Moreover, by increasing informational content, this record building procedure benefits all participants in the patent system because it allows them to form a more certain understanding of the boundaries of the property at issue and more usefully compare it to prior art and commercial goods and services.

INTRODUCTION

The U.S. patent system is one of the oldest and longest running example of direct government intervention in the national economy. The authorization for the creation of instruments and institutions to affect such intervention clearly resides in the U.S. Constitution, which authorizes Congress to "promote the Progress of Science and useful Arts, by securing for limited Times to . . . Inventors the exclusive Right to their respective Discoveries."[1]

In broad strokes, the patent laws operate by providing exclusionary rights to those individuals who through study and experimentation, or through pure serendipity, discover and disclose to the public, novel, useful, and unobvious inventions. As a matter of theory, the public authorizes the laws awarding these rights as part of a constructive bargain with inventors. In simple terms, the bargain gives inventors who comply with legal rules the benefit of an opportunity to exploit their invention in an environment of legally reduced, or in some cases, eliminated, competition. The public's benefit from the bargain is generally thought to be twofold: an increase in quality of life ascribed to the fruits of innovation, *i.e.*, the development and production of new and improved articles of manufacture, methods, and services; and an increase in the amount of useful information, *i.e.*, the tool necessary to speed innovation.

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1 U.S. Const. art. I, § 8.

The validity of the theory of the patent bargain is widely accepted. In addition, by some accounts, a purported high level of innovation in the United States is good evidence that the patent system is working well and does not require any fundamental changes.[2] However, even optimistic observers recognize that there is room for improvement.

In particular, many observers point to the problem of questionable patents. Questionable, or low quality, patents are those patents that should never have issued from the Patent Office because they fail to meet the statutory requirements for patentability.[3] Most commonly, they claim inventions that are either not new or are not sufficiently inventive to meet the requirement that for a patent to be granted the claimed invention must be unobvious in light of the knowledge and abilities of a person of ordinary skill in the art to which the invention pertains.

In a recent report, the Federal Trade Commission ("FTC") has concluded that questionable patents block competition and harm innovation in several ways.[4] The FTC has concluded that questionable patents harm innovation by deterring the entry of new competitors into areas of innovation and by making licensing more complicated thereby spurring a host of inefficient behaviors on the part of competitors.[5] These broad complaints can be considered in terms of transaction costs. For instance, the existence of patents ostensibly directed to a particular subject matter may deter new competitors from pursing projects and innovation in that subject matter because they perceive that the cost of ascertaining whether they can comfortably enter the field is too high. Questionable patents inflate this cost because they add costs that should never have existed.

Likewise, questionable patents inflict excess transaction costs on even established competitors because although they have leverage in a particular field, they must ascertain whether other competitors have overlapping patents and if so, take steps to acquire rights.[6] Overlapping rights mean negotiation and agreement, the costs of which may be exacerbated by the number of competitors

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2 *See* National Research Council of the National Academies, *A Patent System for the 21st Century* 19 (Stephen A. Merrill, Richard C. Levin, & Mark B. Myers, eds., The National Academies Press 2004) [hereinafter A Patent System for the 21st Century]; *see also* Federal Trade Commission, *To Promote Innovation: The Proper Balance of Competition and Patent Law and Policy* 4 (2003) [hereinafter To Promote Innovation] (concluding that "[t]he patent system does, for the most part, achieve a proper balance with competition policy").

3 To Promote Innovation, *supra* n. 2, at 5.

4 *See id.*; *see also* A Patent System for the 21st Century, *supra* n. 2, at 47 (recognizing that "[o]ver the past decade the quality of issued patents has come under sharp attack").

5 *See* To Promote Innovation, *supra* n. 2, at 5-7.

6 *Id.* at 6-7.

and the number of rights that must be coordinated. Thus, it is reasonable to believe that questionable patents suppress patent related transactions to some degree. The suppression of transactions based, at least in part, on the existence of questionable patents may stimulate behaviors that only compound the problem. It is well-known that one strategy established competitors use to overcome the problem of having to coordinate a large number of rights is obtain a large number of patents themselves. These large portfolios, consisting of both legitimate and questionable patents are then used as part of a brute force approach to increase the leverage necessary to gain access to other rights. In the view of some, the race to get more patents-as-bargaining chips is wasteful because it requires the investment of resources to fill patent portfolios with patents that have little to no innovative value when the resources might have been better spend on engaging in work designed to further innovation. In other words, the existence of questionable patents may be driving competitors to obtain even more questionable patents.

The problem of questionable patents unpacks even further, however, in that patents that are later determined invalid may have before that fact stimulated substantial investment.[7] Subsequent determinations of invalidity may terminate otherwise interesting avenues of research if investors can no longer rationalize a reasonably certain way to recoup their investment. Also, of course, if competitors believe that a patent is likely not valid, they are less likely to take a license to that patent. Consequently, there may be a greater likelihood that questionable patents will incur the transactions costs that attend litigation.[8]

Finally, when patents issue covering inventions that are not new, useful, and unobvious, the public is deprived of its benefit of the patent bargain. The public-as-consumer realizes its benefit through the consumption or use of goods and services comprising patented subject matter. The transaction costs discussed above are passed on to the public-as-consumer, and show up, for instance, in the increased cost of goods and services. Accordingly, even when transactions proceed, the suppressive effects of questionable patents reach, and detriment, the public.

The problem of questionable patents is, more often than not, attributed to the two primary institutional players in the patent system, the Patent Office and the Court of Appeals for the Federal Circuit. Although there are a plethora of criticisms for both institutions, the criticisms directed to the Federal Circuit (and in some instances the Supreme Court) generally pertain to doctrinal changes that permit the patenting of subject matter that current observers under-

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7 A Patent System for the 21st Century, *supra* n. 2, at 46-47.

8 *Id.* at 46.

stand to have been unpatentable in the past;[9] the court's general refusal to make special doctrinal exceptions for "newly" patentable matter;[10] doctrinal flaws in those instances where it is (conversely) perceived that the court has given subject matter relating to new technology special treatment (*i.e.*, biotechnology and software);[11] and a doctrinal weakening of the obviousness requirement for patentability.[12]

When it comes to the Patent Office, the criticism is primarily that the Office is simultaneously too overwhelmed, too underskilled, and too adversely incentivized to correctly evaluate the substantive statutory standards of patentability.[13] A suggested solution to these perceived defects is to increase the Office's funding to provide for a greater number of patent examiners and/or second examiner review.[14] Another suggested solution is to add some form,

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9 *See generally* Arti Rai, *Addressing the Patent Gold Rush: The Role of Deference to PTO Denials*, 2 Wash. U. J.L. & Policy 199 (2000) (discussing gene sequences and business methods as inventions "long thought 'unpatentable'").

10 *See e.g.* Dan L. Burk & Mark A. Lemley, *Is Patent Law Technology-Specific?*, 17 Berkeley Tech. L. J. 1155, 1159-60 (2002) (contending that the Federal Circuit applies technology specific rules to biotechnology and software that may not be well-suited to overall goals of patent policy); *see also* Dan L. Burk & Mark A. Lemley, *Policy Levers in Patent Law*, 89 Va. L. Rev. 1575 (2003) (contending that the Federal Circuit has gotten patent policy precisely wrong in the technologies of biotechnology and software); *but see* R. Polk Wagner, *Exactly Backwards: Exceptionalism and the Federal Circuit*, 54 Case W. Res. L. Rev. 749 (2004) (questioning that notion that the Federal Circuit is establishing technology specific rules to guide patent policy).

11 *See* Rai, *supra* n. 9, at 213 (arguing that the Federal Circuit erred by not deferring to the Patent Office's technical expertise in area of biotechnology); Arti K. Rai, *Intellectual Property Rights in Biotechnology: Addressing New Technology*, 34 Wake Forest L. Rev. 827, 833 (1999) (discussing a lowered bar for obviousness in the area of biotechnology); *see also* Lee Petherbridge, *Intelligent TRIPS Implementation: A Strategy for Countries on the Cusp of Development*, 22 U. Pa. J. Int'l Econ. L. 1029, 1054 (2001) (commenting that "[i]n the United States, in the field of biotechnology, it is possible to get a patent on things that are reasonably viewed as obvious.").

12 *See* Brief of Twenty-four Intellectual Property Law Professors as amici curiae*, in KSR International Co. v. Teleflex Inc.*, No. 04-1350 *on Petition for Writ of Certiorari* (May 12, 2005) (contending that the Federal Circuit's misunderstanding of the law of obviousness causes patents to issue that should be considered legally obvious, resulting in overall social disutility).

13 *See generally*, To Promote Innovation, *supra* n. 2 (collecting the comments and criticisms of a number of patent system participants as well as academics).

14 *See* A Patent System for the 21st Century, *supra* n. 2, at 104 ("[I]n the patent examination system . . . there is no substitute for having adequate numbers of trained personnel with sufficient time to exercise their considered judgment on the cases assigned to them."); To Promote Innovation, *supra* n. 2, at 12-14 (recommending that the Patent Office be given greater funding and suggesting a second examiner review of patent applications); *see also, e.g.* Rai,

depending on the proposal, of post-grant review so that questionable patents may be identified and litigated by interested parties around the time of issue.[15]

Each of these solutions will likely entail significant costs. And, while the costs could be administratively shifted to patent applicants, the net effect is to increase the cost of administering the patent system. Because very few patents are actually litigated, and because adding cost to the patent system across the board will only increase the patent tax that consumers must pay, the presumptive solution is to accept examination in its current form and let interested parties make the relevant cost/benefit judgments when specific patents are actually litigated.[16]

This Article argues that it is possible to view the problem of questionable patents as something more than a simply a problem of erroneous substantive decision making by the Patent Office. Rather, this article argues that so-called questionable patents are merely symptomatic of a much more fundamental problem in the patent system: Namely, a failure on the part of the Patent Office to collect (and record) from the applicant information sufficient to permit interested participants the ability to efficiently and reproducibly construct a consistent understanding of the boundaries of the patented property. So viewed, transactions involving questionable patents, and indeed transactions involving all patents, can be productively considered as problems of information costs and information cost allocation. Following from that argument, the Article proposes a theory-based, yet practical, easy to implement, and cost-effective mechanism for reducing the information costs associated with defining patented property.

This article has four main parts. Part I sets forth a theoretical background of information costs in intellectual property generally and considers information costs in the patent system with a particular focus on how the Patent Office functions to allocate information costs for the entire patent system. Based on theoretical considerations, part II provides a detailed proposal for im-

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supra n. 9, at 218 ("One relatively straightforward reform would involve an increase in the number and quality of patent examiners.").

15 *See* A Patent System for the 21st Century, *supra* n. 2, at 95-103 (proposing a PostGrant Open Review Procedure); To Promote Innovation, *supra* n. 2, at 7-8 (recommending a new administrative procedure to allow post-grant review and opposition); *see also* Jay P. Kesan, *Carrots and Sticks to Create a Better Patent System*, 17 Berkeley Tech. L. J. 763 (2002) (setting forth several additional strategies including granting different presumptions of validity depending on the patentee's disclosure of and explanation of relevant of prior art; allowing pre-grant public opposition; and implementing a pro-defendant fee shifting system when invalidity is established based in prior art that should be known to a reasonably diligent patentee).

16 *See generally* Mark Lemley, *Rational Ignorance at the Patent Office*, 95 Nw. U. L. Rev. 1495 (2001) (discussing the potentially high cost that certain systemic improvements might create).

proving the allocation of information costs in the patent system. Part III discusses several different modes of implementation and considers the doctrinal and administrative implications to the institutional participants, while part IV offers some concluding remarks.

I. THEORETICAL BACKGROUND

A. Information Costs and Property

Information costs include a subset of transaction costs associated with understanding the qualities and merits of a transaction. In terms of property transactions, information costs can be thought of as falling into two categories. The first involves the cost to individuals of ascertaining the legal relationships between property owners and everyone else.[17] The second category involves the cost of achieving an understanding of the subject matter that is the property that serves as the nexus for the legal relationship between the parties.[18] Some commentators refer to this second category as pertaining to information about the property-as-a-thing.[19]

The first type of information cost is exemplified by the cost to non-owners of ascertaining their legal duties to the owner of the property. In the case of patents, non-owners have the duty to not infringe—or the duty to avoid violating the patentee's right to exclude—a rather bright rule.[20] The second type of information cost is exemplified by the cost of learning and understanding what the property is—*i.e.*, what are its attributes; what are its boundaries and topography. This second type of information cost is particularly relevant to non-owners who must identify the property to avoid infringement and to that class of non-owners who may want to transact in the property by purchasing it or taking a license. [21]

The information costs associated with understanding the boundaries and topography of real property can be low. In particular, many people seem to have, through either custom or social norm, a reliable conception not only of the legal relationships that surround a piece of real property, but also of what a plot

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17 For a lengthy discussion of this subject, *see* Clarisa Long, *Information Costs in Patent and Copyright*, 90 Va. L. Rev. 465 (2004).

18 *Id.* at 476.

19 *Id.* at 471-74 (explaining the informational distinction between "the contours of the [property] relations created by legal rules, and . . . intellectual 'goods-as-goods'").

20 *Id.* at 474-75.

21 *Id.* at 476-82.

of land actually is. Thus, custom and social norms can operate to lower information costs surrounding real property.[22] By way of example, most people have seen a fence and learned that the presence of a fence imparts particular information about the piece of property it surrounds.

In contrast, the characteristics of patented property, namely that patented property is intangible can make it much more difficult for observers to comprehend the boundaries of the property protected by a patent. The fact that intellectual property is intangible makes it more difficult for observers to rely on those tools often relied upon to comprehend real property, *i.e.*, longstanding customary definitions, communal norms, or social understandings about the boundaries of property.[23] For many individuals who rely on an object-oriented approach to understanding the boundaries of property rights, there is a dearth of information when faced with comprehending the boundaries of intangible property. This problem is exacerbated by the fact that to receive protection, by definition, the property has never existed before.

Another view on how to measure the boundaries of patented property involves examining the property through the lens of the legal rules that establish whether or not an exclusive right should be granted.[24] Because anticipation is the "epitome of obviousness,"[25] this boils down to the proposition that the boundaries of patented property are coterminous with the qualities which make the property nonobvious.[26] So viewed, a non-owner's information costs with respect to the patented property can be very high. As described by Long, an observer must first form a understanding of the patented property as a concept, then form an understanding of the prior art as a concept, finally comparing the two with an eye to ascertaining (1) what the "gap" is between the two concepts—*i.e.*, the protectable attributes, and (2) whether that gap is sufficient to warrant protection.[27] As Long notes, "[i]t is harder to think of a higher measurement-cost margin than this."[28]

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22 *Id.* at 476 (quoting Michael A. Heller, *The Tragedy of the Anticommons: Property in the Transition from Marx to Markets*, 111 Harv. L. Rev. 621, 660 (1998), for the proposition that: "People seem to know private property when they see it.").

23 *Id.* at 483-84.

24 *Id.* at 477-82 (discussing the novelty and nonobviousness requirements of Title 35 U.S.C. §§ 102 and 103).

25 *In re Fracalossi*, 681 F.2d 792, 794 (C.C.P.A. 1982).

26 Although Long describes the use of both the novelty and nonobviousness requirements to define the boundaries of patented property, it is necessary here to consider only obviousness.

27 *See* Long, *supra* n. 17, at 479-80.

28 *Id.* at 480.

Under general principles, information costs, like other transaction costs cannot be completely eliminated. However, social welfare can be improved if information costs can be ablated for a price that is less than the burden of the information costs themselves.

B. A Theory of Information in the U.S. Patent System

In the U.S. patent system, when an applicant makes an application for patent, the public must assess the merits of investing, by granting a patent, in an allegedly new, useful, and unobvious invention. To assess the merits of investing in a new property right, the public relies on a legislatively created instrument, the Patent Office.[29] By statutory authority, the Patent Office establishes the regulations that govern the conduct of examination proceedings in the Office.[30] As discussed below, it is by the exercise of this power that the Office sets the rules and procedures by which the Office collects and records information useful for understanding the boundaries of the property for which an applicant seeks a patent. How well the Office applies the rules in the individual instances sets the practical limitation on the rules' usefulness. As explained below, the Office's use of its information powers is of crucial importance to the fulfillment of its institutional role. How well the Office exercises its authority, from both rule implementing and practical perspectives, is a rate limiting step in the quality of not only Office decision making, but also of the decision making of all other participants in the patent system. The reason, as further explicated below, is that the Office's use of its informational powers serves to allocate the cost of information to all other participants in the patent system.[31]

1. Information Costs at the Patent Office

The U.S. patent system relies heavily on the examination procedures of the United States Patent and Trademark Office to ensure that legal relationships which attend an issued patent are incurred by the public only where the property itself meets the statutory requirements for patentability. These procedures define the property for purposes of examination by both informing the patent examiner's understanding of the topography of the newly discovered property as

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29 *See* 35 U.S.C. § 1 (2000).

30 *See id.* at § 2(b).

31 As further explained, *infra*, there is a common thread to the information cost problems that attend the U.S. Patent System. In particular, the cost of defining the property-as-a-thing, that is, defining its boundaries and topography, is central to nearly every dispute and transaction in the patent system.

well as informing the examiner's understanding of what is *not* new property. After the examiner becomes fully informed regarding the boundaries of the property for which an applicant seeks a patent, and the boundaries of the property already owned by the public, the examiner performs the substantive legal inquiry that governs whether a patent should issue. The entire process is called patent examination. The written recording of these procedures is called the prosecution, or file, history.

The first step in the process of patent examination is establishing a full and complete understanding of the definition of the boundaries of the property to which a patentee seeks the right to exclude. As a matter of statutory law, [32] case law,[33] and regulation,[34] the claims of a patent define the boundaries of the property to which exclusive rights may attach. Thus, before engaging in any substantive decision making, the Office, and more specifically the patent examiner, must interpret the claims of a patent. The information costs involved in defining the property right of a patent are manifold. They primarily derive from (1) the need to collect information sufficient to make reasonably clear the full scope of the claims; (2) the need to separate relevant information from irrelevant information; and (3) the requirement that the examiner, once armed with sufficient information, be sufficiently skilled to conceive of the property in its full scope—to understand its place in the relevant art. At a more practical level, an examiner needs to address issues that include: the general imprecision that exists in the use of language to communicate complex ideas, the state of the examiner's knowledge concerning the art of the claimed invention; an inventor's in-

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[32] The claims are required to "particularly point[] out and distinctly claim[] the subject matter which the applicant regards as his invention." *See* 35 U.S.C. § 112.

[33] *Phillips v. AWH* Corp., 15 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc) ("It is a 'bedrock principle' of patent law that 'the claims of a patent define the invention to which the patentee is entitled the right to exclude.'"); *see also Innova/Pure Water Inc. v. Safari Water Filtrations Sys., Inc.*, 381 F.3d 1111, 1115-16 (Fed. Cir. 2004) (discussing Supreme Court precedent that establishes the primacy of claim language).

[34] Under the regulations, an examiner making an examination is to read the application and "shall make a thorough study thereof." The examination is to be "complete . . . with respect to the patentability of the invention as claimed." *See* 37 C.F.R. § 1.104 (2002). The MPEP provides specific instructions to examiners concerning how claims in patent applications should be interpreted. It directs examiners to afford claims their "broadest reasonable construction" and explains that this approach "reduces the possibility that the claim, once issued, will be interpreted more broadly than is justified." MPEP § 2111 (2005). According to the MPEP, the broadest reasonable construction is the "plain meaning" of the words of the claim as understood by a person of ordinary skill in the art, an interpretation it contrasts as broader than the interpretation a court construing an issued patent would reach because courts interpret claims patents "in light of the specification, prosecution history, prior art and other claims." *Id.*

complete conception of the invention; the quality *vel non* of the written description portion of the patent application, and perhaps more cynically, intentional efforts on the part of some applicants to be as imprecise and obtuse as possible in the language used to define the boundaries of the property.

After establishing the data-points necessary to fully discern the boundaries of the claimed property, the Office must, second, define the boundaries of property already in the public domain. In other words, the examiner has to interpret the prior art, every relevant piece of information available to the public before the critical date of the patent application being examined. This step is informationally very similar to claim interpretation, although there is of course no claim for guidance, and involves the same information costs associated with collection, sifting, and understanding, but draws from a much deeper pool of information. Because the applicant need only provide material information of which he or she is aware, and is not required to search for any of this information, the informational burdens on the examiner are clearly heavy—even before the examiner engages in the heavy lifting of interpreting the prior art.

The third task, that of substantive decision making, requires the Office to apply the substantive statutory standards for patentability by comparing of the full scope of the claimed invention to the full scope of the prior art. For claims to issue, the examiner must not only conclude that the property defined by the claims is outside the bounds of the property already expressly present in the public domain, but must also conclude that the property defined by the claims is outside the bounds of that property which is clearly implied by existing public property.

By any standard, the information costs incurred by the Patent Office are quite high, and, as Long noted when describing a theoretical process to discern the attributes of intangible goods, "[i]t is harder to think of a higher measurement-cost margin than this."[35]

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[35] *See* Long, *supra* n. 17, at 479-80.

2. Information Costs to Competitors

Non-owners of property can be divided into several groups.[36] This Article refers to competitors as the class of non-owners who are reasonably likely to infringe and are interested in pursuing lawful conduct, *i.e.*, not infringing. This class of competitor might seek information on patented products for at least three reasons. First, although uninterested in the property owner's innovative activities, a competitor might simply be seeking to avoid infringement liability in the ordinary course of its business activities. Second, a competitor might be intentionally seeking to use the patented property, and is thus considering a purchase or license. Third, a competitor might be interested in improving the property with an eye to creating new property.

In terms of information costs, competitors can be reasonably sure of their legal relationship vis-à-vis the property owner. Absent permission, they simply must avoid infringement. They must fastidiously observe the patent owner's right to exclude.

The operative question for competitors then, is: "What am I excluded from?" The answer to that question is that they are excluded from using the property-as-a-thing, which is defined by a valid patent. In short, they are excluded from the property that is, at least in theory precisely the same property that the examiner identified and examined. This implicates the same or nearly the same information costs, except a competitor will also have the burden of identifying which patents it might possibly infringe.[37] Thus, a competitor faces the information costs of (1) searching for patents that it might infringe, and after having identified those patents, (2) establishing the data-points necessary to fully discern the boundaries of the claimed property in all those patents, and (3) ensuring that its goods or conduct are clearly outside the boundaries of, or distinct from, the claimed subject matter.

When it comes to determining the boundaries of the patent property, the competitor's situation is distinguishable from the examiner's in one additional regard. As a matter of law, the primary source of information useful for claim

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[36] *See e.g. id.* at 489-95 (discussing avoiders, transactors, and builders). In theory the size of a class of competitors may vary greatly depending on the nature of the thing that is the protected property. For instance, there are likely to be many more competitors for property that comprises a method of brushing teeth, while there may be very few competitors for property which is a difficult and expensive to synthesize organic chemical. Also, because of the non-rivalrous nature of patented goods, there will also be competitors who are unaware they are competitors and unaware they might be infringing.

[37] Some of these concerns are mitigated by the patent marking statute, and the notice provided when a patentee asserts a claim for infringement.

interpretation is fixed when the patent issues.[38] Thus, the competitor must look primarily to the intrinsic record, the claims, the written description, and the prosecution history to determine (and as the case may be, establish) the meaning of the claims, and thus, the *legal* boundaries of the patented property.[39] In terms of information costs, the doctrinal rule can be helpful or harmful. Assuming the relevant intrinsic information reliably and reproducibly delineates the boundaries of the property, the legal rule limiting the search for information to the intrinsic record will be helpful in reducing information costs.

However, in situations where the intrinsic record does not provide enough information to reliably and reproducibly delineate the protected property, the rule generally limiting the inquiry to the intrinsic record may greatly increase information costs. The information is missing. It cannot be dispositively established from the public record. Indeed, in such circumstances parties may have to pay the ultimate information cost—litigating a case to conclusion. Because only then will the parties know what at least some of the relevant boundaries of the patented property actually are.

Where a competitor concludes that its conduct falls within the boundaries of the property for which another has the right to exclude, the competitor must incur even greater information costs. These costs must be incurred to establish whether the patent in question is valid. In such cases a competitor must search the prior art and re-perform the act of substantive decision making originally performed by the examiner. Although like the question of infringement, the competitor incurs largely same information costs as the examiner, the competitor may also incur the additional information cost of litigating the case.

3. Information Costs to Patentees

Before issuance, patentees (or more appropriately patent applicants) suffer the information cost of providing information to the Patent Office concerning the nature of the property for which they seek exclusive rights. This cost is

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[38] *See Phillips*, 415 F.3d at 1303; *Vitronics Corp. v. Conceptronics, Inc.*, 90 F.3d 1576 (Fed. Cir. 1996); *see also* R. Polk Wagner & Lee Petherbridge, *Is the Federal Circuit Succeeding? An Empirical Assessment of Judicial Performance*, 152 U. Pa. L. Rev. 1105 (2004) (examining claim construction methodology).

[39] Notwithstanding the literal consequences of doctrinal logic, it should be noted that clearly other "extrinsic" information enters into the inquiry. However, this extrinsic information is rarely elevated to the level of evidence. For that reason and because it is often sufficiently complex that is susceptible to varying correct (but unhelpful) individualized views, it generally does not have strong legal power or otherwise serve as a normative baseline for the different patent system participants.

necessarily borne by the patent applicant because prior to filing the applicant is the only participant in the patent system who has any information on the boundaries of the property for which it seeks a patent.

The cost of providing information about the boundaries of the property can vary depending on the skill and knowledge of the patentee and his agents. For instance, where the applicant does not have a good understanding of the boundaries of the property, it may be difficult to convey knowledge of those boundaries to the Office. In addition, sometimes the applicant will be trying to obtain a patent in crowded field, *i.e.*, a field in which much of the property is already owned by either the public or other patentees. In such cases the patentee may have to be very careful about the language used to define the boundaries, or run the risk that the Office will reject the claims. Finally, a patent applicant may suffer information costs in trying to educate patent examiners who have difficulty grasping the property that the applicant is trying to delineate through a claim.

Once the patent issues however, an applicant begins to incur information costs similar to those suffered by competitors. Rather than asking "What am I excluded from?", a patentee must ask, "What can I exclude?" This implicates the costs associated with discerning the legal boundaries of the patented property, identifying potentially infringing property, and comparing the boundaries of the patented property to the potentially infringing property.

4. Information Costs to Courts

Before adjudicating the merits of a claim of infringement or a defense of invalidity, courts must first determine the boundaries of the property for which the plaintiff asserts the right to exclude. Courts, however, suffer information costs in a way slightly different from competitors. For instance, it is the court's function to decide the meaning of the claims. Thus, courts will produce a statement of the boundaries of the patented property even where the intrinsic record is of very low informational quality.

Courts, however, may be the victims of the high information costs involved in determining the scope of patented property and in making the substantive decisions on whether a patent should issue. When the informational quality of an intrinsic record is too low, both parties to a litigation may feel that their arguments directed to defining the scope of the patented property may prevail. In such cases, they may be less likely to settle because they misapprehend the

economic (or moral) merit of their position. Consequently, information deficiencies may be a factor in creating excess judicial workload. [40]

5. Information Costs to the Public-at-Large

As mentioned at the outset, it is generally thought the public receives its benefit from the patent system in two broad ways. First, the public is thought to enjoy an increase in the quality of life, which is ascribed to the fruits of innovation, *i.e.*, the development and production of new and improved articles of manufacture, methods, and services. Second, by granting patents in exchange for disclosure, the public enjoys an increase in the amount of useful information in the public domain, *i.e.*, the tool necessary to speed future innovation.

The first benefit the public receives is actually a second level benefit which may fluctuate depending on transaction costs—including information costs—incurred by patentees and competitors. For instance, where transactions between relevant parties are suppressed or hindered because of high information costs, the public either does not receive new innovation at an efficient rate, and/or to the extent new innovation does develop, the public has paid too high a price.

However, the second benefit directly implicates the information costs associated with discerning the boundaries of the patented property. Although the information provided by patent disclosures will be intellectually available to different subsets of the public, in order for that information to be used, those "capable" members of the public will have to incur the costs of ascertaining what property—what inventive subject matter—is disclosed in the patent. It should be noted, however, that the "noncompetitive" public may not always have to determine the boundaries of the protected property with the same preci-

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[40] Moreover to the extent that courts contribute to the problem it may be because they appear to have been unable to explain to the bar how to reliably and reproducibly determine the meaning of patent claims. *See* Wagner & Petherbridge, *supra* n. 38. For example, recent data indicates that the Federal Circuit, widely-known as the most skilled court in the United States in dealing with the problem of defining the boundaries of patented property, reverses a district court's determination of the boundaries of patented property nearly fifty-percent of the time. *See* Christian A. Chu, *Empirical Analysis of the Federal Circuit's Claim Construction Trends*, 16 Berkeley Tech. L. J. 1075, 1098 (2001); Kimberly Moore, *Are District Court Judges Equipped to Resolve Patent Cases?*, 15 Harv. J.L. & Tech. 1, 14 (2001) (finding reversal rates to be slightly less, only 33%); *see also* Wagner & Petherbridge, *supra* n. 38, at 1111-12 (analyzing all Federal Circuit claim construction jurisprudence since the Supreme Court's famous *Markman* decision). Assuming litigants observe Rule 11, these studies imply that claim construction law permits litigants on both sides of a case to believe they have the correct understanding of the meaning of the claims.

sion as competitors. For instance, in some cases, all the public may need are teachings from the written description.

C. A Common Nucleus

The examination of the information costs incurred by the different participants in the patent system indicates a common nucleus. Specifically, the rate limiting step—that is to say, the step that must be performed consistently well and predictably by each of the participants in the patent system—is the step of determining the full scope and identity of the property-as-a-thing; in other words, the boundaries of the patented property. Thus, before it can even consider whether a patent can be granted the Patent Office must ascertain the full scope of the boundaries of the property to which the applicant seeks the right to exclude. Likewise, before a competitor can know whether it is possible to avoid infringement, whether it is desirable to obtain a license, or whether it is possible to improve patented property, a competitor must know the full scope of those boundaries. And, of course, patentees need to determine the boundaries of the property in order to prevent infringement.

Appreciating that the information costs associated with determining the boundaries of the property are a cost that is present in nearly every patent transaction suggests that if we take steps to maximize the degree to which patent system participants will, when faced with patented property, reliably and reproducibly arrive at the same understanding of the bounds of that property, we can reduce the transaction costs involved in the patent system and achieve benefits that should inure to all participants.

Before we can consider what steps to take to improve the information needed so that all interested participants in the patent may more reliably and predictably understand the boundaries of patented property, we must first consider how information costs are created and allocated in the patent system. As I discuss below, the Patent Office is nearly entirely responsible for the allocation of the cost of information needed to understand the boundaries of patented property.[41]

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[41] This is not to diminish the role of the applicant who is responsible for allocation in a different sense. The Office, however, serves the public's demand for information and is responsible for ensuring compliance with that demand.

D. The Information Cost Allocation Function of the Patent Office

The Patent Office has three primary information functions. Those functions include collection, use, and recordation. The Patent Office performs its "collection" function by (1) collecting information concerning the boundaries of the property for which an applicant seeks the right to exclude and (2) collecting information concerning the prior art. The Patent Office performs its "use" function by engaging in the substantive decision making that attends the statutory requirements for patentability. The Patent Office performs its "recordation" function by (1) recording information useful for defining the boundaries of the property and (2) recording information that shows how the boundaries of the patented property make that property completely and patentably distinct from property already in the public domain.[42] The product of the Patent Office's performance of its recordation function is the intrinsic record. In other words, the claims, written description, and prosecution history.

Although the Patent Office can collect information from any source to inform its understanding of the boundaries of the patented property, the other participants in the patent system, *i.e.*, competitors, courts, and the public-at-large cannot. When the patent issues, the intrinsic record becomes fixed. Moreover, outside of litigation or private agreement, the other patent system participants are generally limited to the intrinsic record to determine (1) what are the boundaries of the exclusive property,[43] and (2) how did the Patent Office reach the conclusion that whatever the property is, its boundaries do not encompass property already owned by the public.

Because the record becomes fixed at issue, how well the Patent Office performs its information functions is a rate limiting step in the patent system and thus allocates information costs to other participants. Take, for example, the situation of the Patent Office failing to collect information from the applicant sufficient to fully identify the boundaries of the property for which an applicant seeks a patent. In such a case, the Patent Office has first allocated the cost of providing that information to itself. Ordinarily the cost to the Patent Office of providing this information without recourse to the applicant will be very high.[44] If the Patent Office cannot pay this cost, it cannot form an objectively reproducible understanding of the full scope of the boundaries of the protected prop-

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42 *See generally* 37 C.F.R. § 1.

43 *See e.g. Phillips*, 415 F.3d at 1314.

44 In fact, if the Office could perform the task, one would expect that applicant had (1) either provided sufficient information or (2) the invention itself was obvious.

erty. Without an understanding of the full scope of the protected property, it is not possible to meaningfully compare that property to the prior art. In such cases then, the Patent Office cannot consistently perform its second information function, use, which requires that the first function, collection, have been successful. The result is haphazard, or random, granting of patents.[45] As discussed above,[46] granting patents of indeterminate validity and scope translates into additional transaction costs for patent system participants.

Where the Patent Office fails to collect, or merely fails to record the information necessary to identify the boundaries of the claimed property, and cannot provide the information itself, it allocates the cost of providing the information to other participants in the patent system. Because the record is fixed, however, the cost other participants in the patent system can be quite high. Often, there little legally relevant information that can be obtained outside of an *inter partes* transaction. Where the information of record is insufficient to define the boundaries of patented property, however, negotiation can be difficult because the scope of the right may be highly uncertain. Moreover, litigation to conclusion may be the only recourse, because the dearth of information in the record may cause the transacting parties to either (1) misevaluate the respective strengths of their positions, or (2) decide that a fifty-percent chance of prevailing is worth the risk.

Indeed, because the doctrinal rules push the cost of obtaining information about the boundaries of the patented property to such heights, the other patent system participants, including patentees, are forced to acquire somewhat different information. Rather than devoting resources to establishing the

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[45] Because patent examination procedure is effectively structured such that an applicant is entitled to a patent unless the office can prove that the statutory standards are not met, the reality is perhaps less like haphazardness or randomness an more like an automatic green light to patentability reminiscent of a registration, rather than examination, system. Recent studies indicate that where applicants vigorously pursue applications, patents are highly likely to issue. One recent study reports that when applicants are prepared to pursue applications all the way, that is they are prepared to file continuation applications, continuations-in-part, and divisional applications, the Patent Office eventually issued patents at least 85 percent and perhaps as high as 97 percent of the time. Cecil D. Quillen & Ogden H. Webster, *Continuing Patent Applications and Performance of the U.S. Patent and Trademark Office*, 11 Fed Cir B.J. 1, 12, 17 (2001). In a follow up study, designed to refine the number of issues by accounting for patents that issue from the same disclosure, *e.g.* where a patent issues from both a parent application and a continuing application, the authors found the issue rate to be 83 percent. Cecil D. Quillen, Ogden H. Webster, & Richard Eichman, *Continuing Patent Applications and Performance of the U.S. Patent and Trademark Office*, 12 Fed. Cir. B.J. 35, 38, 54 (2002).

[46] *See supra* Introduction.

boundaries of the patented property, patent system participants must instead seek the "information" of resolution, *i.e.*, "I am safe" through either negotiation or litigation. Information on liability *vel non* is useful information,[47] but it may add little to the category of information legally useful for defining the boundaries of patented property. Moreover, absent a conclusion of invalidity litigation will have a minimal impact on the quantity of legally relevant information useful for defining the boundaries of patented property.[48]

Where the Patent Office fails to collect and record information concerning the boundaries of the protected property, it allocates additional information costs to interested parties and courts. The work of searching for the relevant prior art, and comparing that art to property at issue must be re-performed. Given the high information costs associated with validity, the added costs of resolving the problem of indeterminate scope may often make the cost of a predictable and reliable validity analysis all but insurmountable.

1. Features of the Patent Office's Information Functions

First, as is evident, the Patent Office allocates information costs to patent system participants based on the quality of the performance of its information functions. In particular, where the Patent Office does not spend enough to determine the boundaries of the property, it cannot make a meaningful determination on whether or not a patent should issue. Moreover, where the Patent Office does not collect and record sufficient information for other parties to reliably determine the boundaries of the property, it transfers the cost of that inquiry to other participants in the patent system. Unfortunately, however, the cost to other participants of determining the boundaries of the patented property may be much higher than it is for the Patent Office. This is because unlike the Patent Office, who can reach to a wide range of sources, including the applicant,

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47 A judgment of noninfringement is in effect a piece of information that whatever the boundaries of the patented property, those boundaries do no include the accused infringers goods or conduct.

48 *See A.B. Dick Co. v. Burroughs Corp.*, 713 F.2d 700, 705 (Fed. Cir. 1983) (allowing for the application of collateral estoppel, but explaining that it is to be very narrowly tailored: "judicial statements regarding the scope of patent claims are hypothetical insofar as they purport to resolve the question of whether prior art or products not before the court would, respectively, anticipate or infringe the patent claims"). Collateral estoppel in these cases is further limited by a fairness exception, *id.* In what cases it would be fair to prevent a new infringement defendant from presenting new arguments for claim interpretation or new pieces or interpretations of prior art would have to be seriously considered.

to establish an understanding of the boundaries, the other participants are generally limited to the fixed intrinsic record. If the fixed record is not sufficiently clear, the boundaries of the granted property right are uncertain. Generally speaking, the more uncertain the boundaries of the right are, the higher the costs to parties who need (or want) to bargain or transact in the property.

Second, the Patent Office is the *ex ante* arbiter of whether a patent should issue. This fact, combined with the fact that determining the boundaries of the property is central to nearly all patent transactions means that when the Patent Office fails to properly perform its information cost functions, the effects are amplified throughout the patent system.

Third, while the Patent Office's information functions are a mix of the substantive and the procedural, the procedural functions appear to be a prerequisite for the performance of the Patent Office's substantive function. Thus, one would expect that the better the Patent Office performs its procedural functions, the more likely it is that the Patent Office correctly determines the substantive question of obviousness. Moreover, one would expect that the better the Patent Office performs its procedural functions, the more likely it is that the competitors and courts can rectify errors in the Patent Office's decision making.

2. Implications

To begin with, the Patent Office determines the boundaries of the patented property for the entire patent system primarily through a process of collecting and recording information, and less through the substantive use of information.

Next, the better the Patent Office collects and uses information about the boundaries of the property right, the higher the quality of examination. In addition, the better the Patent Office collects and records information defining the boundaries of the property, the more likely it is that any mistakes in Patent Office substantive decision making can rectified because parties and adjudicators could more easily identify and be more certain about the Patent Office's errors in judgment. Thus, obtaining better information concerning the boundaries of the patented property can serve as an important buffer against erroneous substantive decision making.

In addition, the concern over low quality patents is perhaps substantially miscast as a problem primarily of erroneous Patent Office decision making. Low quality patents can be meaningfully thought of as one of two types. The first type, the "obviousness-type" questionable patent, claims inventions that are either not new or are not sufficiently inventive to be unobvious in light of the knowledge and abilities of a person of ordinary skill in the art to which the invention pertains.

The obviousness-type questionable patent has within it, two subtypes. The first subtype reflects an error in judgment by the Patent Office on the merits of the question of obviousness, in other words, a substantive error in the application by the patent examiner of the law of obviousness.

The second subtype reflects a correct judgment on the merits of the question of obviousness, but error on the part of the Patent Office in discerning the scope of the property that it must compare to the prior art. In other words, the Patent Office correctly applied the substantive law of obviousness, but either compared the wrong property to the prior art, or due to misapprehension of the claimed property failed to collect the best, most material art. This second subtype reflects an error not in the application of the difficult-to-apply doctrine of obviousness, but rather, in the determination of the boundaries of the property for which the patentee seeks the right to exclude.

The other main type of questionable patent is the "written description-type" questionable patent. This type of questionable patent is characterized by a significant disconnect between the scope of the invention described in the written description and the scope of the invention claimed. This type of questionable patent never should have issued because the claimed invention is insufficiently described. This type of questionable patent, like the second obviousness-subtype, does not reflect an error in the substantive law of patentability,[49] but instead reflects an error on the part of the Patent Office in understanding the boundaries of the property for which an applicant seeks exclusive rights.

Using questionable patents as a surrogate for transaction cost generating features of patents suggests that patent generated transaction costs flow only partially from errors in Patent Office substantive decision making. Instead, patent generated transaction costs are at least as likely to flow from the inability of first the Patent Office, and later other participants in the patent system to efficiently form a reproducible understanding of the boundaries of patented property. Examining property for obviousness is a famously difficult enterprise that is fraught with very high information costs.[50] Indeed, obviousness distills to a judgment call following the consideration of the *Graham* factors.[51] This sug-

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[49] It is possible, but because of the nature of the written description requirement not particularly meaningful here, to separate an additional written description-type questionable patent.

[50] Long, *supra* n. 17, at 479-80.

[51] *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966) ("[t]he § 103 condition, which is but one of three conditions, each of which must be satisfied, lends itself to several basic factual inquiries. Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or non-obviousness of the subject matter is determined. Such secondary considerations as commer-

gests that improvements in the task of substantive decision making will be hard won.

By contrast, defining the boundaries of patented property, while still subject to judgments concerning the meaning of words and the relevant context, is perhaps more amenable to improvement. Indeed, in its recent *Phillips* opinion the Federal Circuit has attempted just that, suggesting that the Court at least believes that the process of claim interpretation can be made more clear, more reliable, and more predictable.[52] Given the difficulty of obviousness, and given that many of the transaction cost generating features of patents have as their kernel the problem of defining the boundaries of the patented property, it makes sense to think that changes to the patent system that would improve the ability of all interested participants to reliably and consistently reach a similar understanding of the boundaries of the property should be very useful. Moreover, such an improvement would be useful well beyond the realm of low quality patents, because the same broad considerations apply to all patents.

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cial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented.").

52 415 F.3d at 1303.

3. Features of an Improvement[53]

Reducing transaction costs associated with defining the boundaries of the property for less than the cost of implementing the changes necessary to reduce those costs should widely reduce transaction costs in the patent system, resulting in a system of greater utility. Thus, to ensure that costs incurred through "improvement" are less than the costs that are ablated, any proposal to reduce the information costs in the patent system should strive to be as inexpensive as possible. For this to occur, the proposal must take into account that many patents may not be particularly economically relevant. It would be best, therefore, to spend as little as possible on these sorts of patents.

A proposal should recognize that the Patent Office, as information cost allocator, is in a unique position to provide vertical systemic benefits if it can improve the quantity and quality of information useful for defining the boundaries of the property. Because the Patent Office, unlike competitors and the public, has the ability to collect and record the information necessary to define the boundaries of the property, the Patent Office has meaningful control over the systemic impact of information costs in patent law. Furthermore, in its institutional position as the *ex ante* arbiter of whether a patent should issue, the Patent Office has the statutory authority and regulatory authority to require information from patent applicants.[54]

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[53] The term improvement is appropriate here because information costs in the patent system can never be eliminated. Also, it should be recognized that the patent system does have some rules concerning the disclosure of information. This probably so because it is simply indisputable that as compared to all other participants in the patent system the applicant knows more about the property for which a patent is sought than any other player. By way of example, both the statute and Patent Office rules require that a person seeking a patent file an application with a specification that includes a written description and claims. 35 U.S.C. § 112; 37 C.F.R. § 1.75(d)(1) (requiring that "claims must conform to the invention as set forth in the remainder of the specification and . . . find clear support . . . in the description so that the meaning of the terms in the claims may be ascertainable by reference to the description."). In addition, the rules provide some guidance on how property boundary information will normally be extracted from claims. For instance, 37 C.F.R. § 1.75 requires that the least restrictive claim be presented as claim number 1 and state that "[c]laims in dependent form shall be construed to include all the limitations of the claim incorporated by reference." 37 C.F.R. at § 1.75(c), (g) Moreover, Patent Office rules require that applicants submit information known and available to them that is material to patentability. 37 C.F.R. § 1.56(a). For a discussion of these and other statutory, regulatory, and doctrinal "information producing rules" *see* Christopher A. Cotropia, *Patent Claim Interpretation and Information Costs*, 9 Lewis & Clark L. Rev. 57, 67-74 (2005).

[54] 35 U.S.C. § 2; 37 C.F.R. § 1.105.

The Patent Office defines the boundaries of the patented property for the entire patent system using more procedure than substance.[55] Since not all examiners are necessarily of skill in the relevant art, and since it will be very difficult to make human beings smarter a proposal should focus on using procedure to improve the informational quality of patents.

Finally, any proposal should recognize that the patent applicant is the cheapest cost provider of the information necessary to define the boundaries of the property for which the applicant seeks the right to exclude. It should also recognize that due to doctrinal rules, the cost of providing information jumps very significantly if other parties are forced to provide the necessary information. Thus, procedural changes should be directed to collecting information from the patent applicant.

II. THE PROPOSAL: POSITIVE EXAMINATION

Positive examination seeks to improve the allocation of information costs in the patent system by exploiting the knowledge that information concerning the boundaries of the patented property is of critical importance, and that because of its information cost allocation function, the Patent Office is in a unique position to cheaply provide vertical systemic benefits. As set forth below, positive examination is a simple, low-cost proposal that takes into account all of the features of an improvement discussed above. Positive examination uses a low-cost procedural rule implemented early in the process of patent examination, which drives a cooperative relationship between the applicant and the examiner. The result is a procedural change specifically directed to increasing the amount of information in the public administrative record that is precisely targeted to defining the boundaries of the patented property.

In so doing, positive examination can improve the patent system in several important ways. First, it reduces the likelihood that an examiner will make an incorrect substantive decision due to the failure to fully comprehend the scope of the patent right. Second, it mechanically creates information directly related to the scope of the right. This makes it less likely that the Patent Office and post-grant participants will be required to bear the cost of providing the information necessary to establish the boundaries of patented property and additionally reduces the patent generated transaction costs that flow from incomplete information about the boundaries of the patented property that must otherwise be borne by the Patent Office, the patentee, competitors, and the public. In addition, positive examination can assist judicial decision making by making more

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[55] *See generally* 37 C.F.R. § 1.

manageable the information costs attending defining the scope of the property right at that level.

A. The Mechanics of Positive Examination

From a practical standpoint, positive examination is quite simple. It requires only a single procedural alteration to the current examination regime. Specifically, the proposal is completely implemented by the simple positive rule that early in the administrative process the examiner commits to the administrative record the examiner's understanding of the boundaries of the property for which the applicant seeks the right to exclude. The examiner's understanding of the scope of the boundaries will not, however, become binding on the applicant unless the applicant ratifies it by expressly agreeing or impliedly agreeing by deciding not to comment. Rather, the examiner's definition of the boundaries of the property serves as a framework from which the patent applicant can provided targeted information necessary to build a record of those attributes or data points that define the boundaries of the property to which the applicant considers himself entitled.

Positive examination is completely implemented by requiring the patent examiner to engage in one simple mechanical step. In particular, in its basic form, the examiner is required to complete a claim chart which becomes part of the prosecution history. It accompanies the ordinary correspondence of prosecution and serves as a living, breathing document that reflects how the boundaries of the patented property are refined by prosecution. Claim charts are tools common to the practice of patent law. Accordingly, they are familiar to patent applicants, patent examiners, and patent knowledgeable observers. A claim chart is a simple document typically containing several columns. In the far left column is the claim or claims, deconstructed in some meaningful way, usually by resort to distinct elements. In the next column over, an interpretation of that claim element is written out. A third column may optionally be added in which legal or factual support for a particular interpretation can be added and/or citation of prior art encompassed by the claims as interpreted can be efficiently linked to the relevant claim limitations. The act of the examiner completing the claim chart instantly provides significant benefits. But, as will be explained below, the benefits of this simple plan go far beyond the immediate.

CLAIM CHART

Claim	Interpretation	Prior Art (optional)

Employing a claim chart as an informational tool is low-cost. Even in the current examination regime, a patent examiner is required to discern the full scope of the property at issue.[56] However, currently, examiners typically commit to the record little or no information concerning the product of that work. All positive examination requires is that the examiner commits to the record some of his mental work. Because examiners are already required to perform this mental step as part of the examination process, committing it to paper should not be too difficult.[57]

Moreover, electronic filing techniques further reduce the cost of positive examination. The Patent Office could elect to require an electronic copy of each patent application and either require applicants to provide a claim chart, or use software to identify the claims in the file and automatically create a claim chart.

It should be noted that there is an information cost to patent examiners in expressing an understanding of the claims. This cost has two components; the first is the cost necessary to mentally form an expression of the boundaries of the property. The second is the cost of transmitting that expression. We should consider embracing the first cost. After all, how well can an examiner understand the boundaries of the property that is being examined if the examiner cannot create the words necessary to form an expression of the qualities and attributes of that property? The second cost, transmitting the expression to paper can be reduced by several means. An examiner, besides typing in the results of his cognitive process, might use electronic means to search for and cut and paste relevant definitions from (1) technical or other dictionaries; (2) an Office or art unit glossary; (3) other patents in the art with which the examiner is familiar; or (4) portions of the written description that the examiner has used to inform his understanding of the meaning of particular claim elements.

In addition, not every term of a patent will need to be addressed. For example, certain terms like, "comprising,"[58] or "operatively connected"[59] are essentially terms of art in patent law. They need no additional treatment.

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56 Long, *supra* n. 17.

57 To the extent that some readers might believe that no matter the current requirements of examination, examiners do not perform this crucial step, or perform it less than rigorously, positive examination performs an additional critical function. By requiring examiners to show their work for this step of examination, it reminds the examiner to focus on this critical inquiry.

58 *See e.g. Gillette Co. v. Energizer Holdings, Inc.*, 405 F.3d 1367, 1371-72 (Fed. Cir. 2005) (stating well-settled law that the term comprising is presumptively open-ended and, and thus, "[t]he addition of elements not recited in the claim cannot defeat infringement.")

59 *See e.g. Innova*, 381 F.3d at 1120 (explaining that elements are "operatively connected" where they are "arranged in a manner capable of performing the [recited] function").

Moreover, because dependent claims[60] cannot be infringed unless the independent claims from which they depend are also infringed,[61] examiners can focus first and foremost on the relatively few independent claims in the application. Dependent claims could be addressed either narrowly—on their additional limitations—or perhaps not at all depending on the examiner's judgment.

Because cost is such an important issue, it should be noted that positive examination does not contemplate that the examiner exhaustively labor on claim interpretation. Nor does positive examination contemplate that prosecution will require additional Office Actions.[62] Rather, the point of positive examination is to create a relationship in which the cheapest cost provider of the relevant information, *i.e.*, the patent applicant, will be forced to participate. Control over the cost of prosecution lies primarily with the applicant. The better job the applicant does of explaining the boundaries of the patented property, generally speaking, the lower the cost of prosecution. Indeed, some of the time, positive examination is expected to literally lower the cost of prosecution to the applicant as compared to the current cost.

In some cases, the informational quality of the application regarding the boundaries of the property will be superb. In such cases, the information costs associated with this aspect of examination will not only be relatively low, but will entail second level cost savings. The examiner will quickly and easily understand the boundaries of the property, and create a claim chart that is coterminous with the applicant's desires. No back and forth is needed. In other cases, where the information quality of the application is very low, positive examination contemplates that the examiner will still quickly set forth an understanding of the claims. Instead of relying on the applicant's low quality disclosure, which is more cost-effective where the disclosure is clear, the examiner should immediately go to secondary sources, *e.g.*, Patent Office glossaries, dictionaries, etc., that allow the framework for a dialog concerning the boundaries to be created. In short, when faced with a low quality or ambiguous disclosure, the examiner should immediately put the ball back in the applicant's court, because the applicant is the cheapest cost provider of the information necessary to estab-

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60 Dependent claims are claims that "shall be construed to incorporate by reference all the limitations of the claim to which it refers." 35 U.S.C. § 112 ¶ 4.

61 *Wahpeton Canvas Co. v. Frontier, Inc.*, 870 F.2d 1546, 1553 (Fed. Cir. 1989) (stating that "dependent claims cannot be found infringed unless the claims from which they depend have been found to have been infringed")

62 An Office Action is the written embodiment of the administrative response to an Applicant's demand for a patent.

lish the boundaries of the property.[63] When applicant receives a claim chart from the Patent Office that defines an invention that does not resemble the boundaries of the contemplated property, the applicant will know that the application did a poor job of conveying that information and can take open and recorded steps to correct the examiner's understanding.

By way of example, consider a hypothetical patent[64] which makes the following disclosures.

U.S. Patent No. 5,400,000

WRITTEN DESCRIPTION

- A first piece of DNA performs the function of activating a gene.
- A second piece of DNA encodes the gene for human protein X.
- The two pieces of DNA may be ligated, i.e., stuck together, and introduced into a cell.
- In the cell, the first piece of DNA will activate the second piece of DNA which results in substantial amounts of human protein X.

I claim:

- A method for producing a human protein comprising culturing a mammalian cell containing a chromosomally integrated nucleotide sequence encoding a human protein X controlled by a regulatory sequence that promotes gene expression.

Positive Examination

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63 Undoubtedly, some applicants may insist on ambiguity. There are several ways in which the Office could handle such an applicant. A non-exhaustive list includes: First, the Office could simply treat a non-responsive reply as acquiescence to the examiner's interpretation. Second, the Office could simply inform the applicant that the information it provided was not good enough, demand more information, and collect a fee. In addition, if this occurs in the second action, the examiner can treat it as final, requiring the applicant to continue the application and pay a fee. Third, the Office could simply abandon the application, leaving the applicant the costly recourse of seeking a ruling from the Director and, ultimately, challenging the Director's discretion under the Administrative Procedures Act.

64 This hypothetical is not, and is not intended to be, any comment on any existing patent, patent application, or judicial decision. It is merely a convenient example to demonstrate the application of positive examination.

Following the ordinary procedures of examination, the examiner serving as the public's proxy for the objective skilled artisan would read the written description and the claims of this patent. Applying the principles of positive examination, immediately thereafter the examiner would take a moment to consider the full scope of the property for which the applicant seeks a patent and enter that information into the claim chart which is part of the intrinsic record. The examiner might fill out the claim chart as follows, rejecting the claim as obvious in light of, *e.g.*, Alberts et al., reference and for failure to either enable or describe certain elements.

Claim	**Examiner's Interpretation**	**Prior Art (optional)**
A method for producing a human protein X	Preamble of no interpretive value	
Comprising	Includes what follows plus any added elements	
culturing a mammalian cell	growing cells derived from an animal of the class mammalia in a laboratory;	Bruce Alberts et. al., *Molecular Biology of the Cell* (1989).
containing a chromosomally integrated nucleotide sequence encoding a human protein X	where exogenous DNA has been introduced or inserted into cells' chromosomes and the exogenous DNA is a sequence that is capable of being transcribed and translated by normal cellular processes into human protein X	*Id.*
controlled by a regulatory sequence that promotes gene expression	the amount of human protein X made by a cell can be influenced or altered by the proximity of additional exogenous DNA sequences.	*Id.; § 112.*

In one embodiment of positive examination, the examiner could then complete the Action and send it back to the applicant. Upon receiving the Action, the applicant might conclude that the examiner's understanding of the boundaries of the invention was too narrow. For instance, the applicant, knowing (1) what he believes his invention to be, (2) the commercial goals for the invention, (3) how the invention fits within the art, and (4) how easy at least some forms of infringement might be might think that the examiner misunderstood "culturing a mammalian cell" by limiting his conception to both "growing" and "in a laboratory." The applicant may seek a definition of "culturing a mammalian cell" where "culturing" only requires subsistence, no increase in

size or number. In addition, the applicant might conclude that the term "laboratory" is both too limiting and too easy for a potential infringer to avoid.[65] If so, he might seek a definition of "culturing" in which included "culturing" outside of a laboratory.

On the subsequent limitation, the applicant might take issue with the term "chromosomally integrated." For example, the applicant should note that the examiner understood that the property was limited to embodiments where "exogenous DNA has been introduced." The applicant, however, may think that definition is too limiting and, if so, might inform the examiner that "chromosomally integrated" merely means "in a chromosome" and is not limited to DNA that was introduced from outside the cell.

Depending on the precise embodiment of positive examination deployed, the applicant could simply make the clarifications in the text of the response, could amend claims, or could ask that the examiner change his claim chart to reflect the sought after definitions. Thus in one embodiment,[66] the examiner might, in response to the applicant's demands, make the following adjustments, removing the bracketed language and adding the underlined language.

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65 For example, the applicant may intend or envision a commercial embodiment that produces human protein X using living animals as bioreactors. In such a case, the animals containing the DNA may freely over a farm or ranch, falling outside the definition of "laboratory."

66 Although an embodiment in which the examiner performs the act of setting forth an initial claim interpretation is perhaps the most preferred, as is evident to the reader, the principles of positive examination can be employed in other embodiments. For instance, in one embodiment the applicant might be required to submit a completed claim chart at the time of filing. The chart could be required to include the applicant's interpretation of the claims, as well as information identifying the corresponding supporting disclosure and/or other sources of information, if there are any, which the applicant views as objective support for his interpretation. In yet another embodiment, the applicant could be required to help the examiner sort prior art by including in the chart information linking particular pieces of material prior art to particular claim limitations.

Claim	**Examiner's Interpretation**	**Prior Art (optional)**
A method for producing a human protein X	Preamble of no interpretive value	
comprising	Includes what follows plus any added elements	
culturing a mammalian cell	[growing] sustaining cells derived from an animal of the class mammalia [in a laboratory];	Bruce Alberts et. al., *Molecular Biology of the Cell* (1989).
containing a chromosomally integrated nucleotide sequence encoding a human protein X	where [exogenous DNA has been introduced or inserted into cells' chromosomes and] the [exogenous] DNA is a sequence that is capable of being transcribed and translated by normal cellular processes into human protein X	*Id.*
controlled by a regulatory sequence that promotes gene expression	the amount of human protein X made by a cell can be influenced or altered by the proximity of additional exogenous DNA sequences.	*Id.; § 112.*

With this better understanding of the boundaries of the property, the examiner can reconsider the art cited against the claims in light of the applicant's arguments as well as reconsider whether boundaries this wide are supported by the applicant's written description and whether the applicant has enabled the full scope of this property. In this case, for instance, the disclosure makes no express reference to "culturing . . . cell[s]" in living animals. In addition, according to the disclosure, the only means provided for making human protein X requires the use of exogenous DNA. Because of positive examination's precise focus on the prospective patent's boundaries, and because it breaks information down into more easily comprehendible chunks and elements, it allows the examiner and applicant to confront these important issues in the context of examination where they can be publicly resolved. In this case, the applicant and examiner may correspond on the extent to which the scope the applicant seeks, if not expressly disclosed, is "inherently" disclosed given the relevant knowledge and skill of the art.

In the example provided above, the applicant refined his explanation of the boundaries of the patent sought by broadening those boundaries within the plain meaning of the claims. Although perhaps needless to say, an applicant may also narrow the meaning. The examiner may contend in his rejection that

the claim's definition of the boundary of "a regulatory sequence" fails to "particularly point[] out"[67] which regulatory sequences are part of the invention. Alternatively, given the disclosure the examiner may contend that the boundaries set forth by "a regulatory sequence" are not described or enabled by applicant's disclosure.[68] If the applicant disagrees, publicly accessible argument can be presented as to why "a regulatory sequence" is appropriate in light of this disclosure and the relevant knowledge and skill in the art.

B. The Benefits of Positive Examination

As is explained in more detail below, this mostly clinical task performs at least four important functions. First, it focuses the examiner's attention for some period of time on the absolutely critical question of understanding the full scope and breadth of the property for which the applicant seeks the right to exclude. Second, it gives the patent applicant some insight into the examiner's thought process. The applicant will better understand if the examiner is "getting it" or not. When it is clear that the examiner is struggling, positive examination can help the applicant discover on what points the examiner needs additional education. Third, the framework of the boundaries created by the examiner inspires a dialog that is specifically targeted to obtaining information about the boundaries of the property. In so doing, it reduces discussion about irrelevancies and more efficiently than traditional examination collects information directly pertaining to the boundaries of the property. Finally, of course, positive examination creates a public record more likely to identify what property was actually compared to the prior art during examination. Because it is axiomatic[69] that the boundaries of patented property can be no greater than the boundaries of the property that was examined for patentability, positive examination will make more transparent the relationship between the rights granted by the Patent Office and the rights the patentee hopes to assert. That, in turn, provides for a more meaningful future review of what boundary-rights a patentee later claims and how effectively the Patent Office performed its substantive decision making.

1. Benefits to the Patent Office

The Patent Office is charged with making certain that the U.S. public receives the benefit of the patent bargain. Accordingly, the Patent Office has a

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67 35 U.S.C. § 112 ¶ 2.

68 *Id.* at ¶1.

69 At least as a doctrinal matter.

very strong interest in issuing patents that grant a property right in truly new, useful, and unobvious subject matter. The Patent Office is susceptible to two kinds of nonexclusive critical error when grants a patent. When the Patent Office makes a mistake and issues a patent that does not meet the criteria of new, useful, and nonobvious, it permits a patentee to take property that is already lawfully owned by the public. Because the patentee obtains as part of the patent property right, the right to exclude, a patentee possessing a patent that does not meet the standards for patentability can exclude the public from its own property and charge rent to use the same. The Patent Office also is susceptible to mistakes of the other extreme. The Patent Office may mistakenly issue patents, whose scope is well beyond the invention disclosed to the public. In these circumstances, the Patent Office has erred in giving the patent applicant the right to exclude well beyond the scope of the invention given in exchange for that right. Assuming the absence of corruption or simple clerk-function mistake, the cause of both of these errors may often stem from the information costs associated with defining the scope of the property right. Positive examination immediately assists the Patent Office by reducing the information costs associated with understanding the property right.

Positive examination benefits the Patent Office because it collects information concerning the scope of the boundaries of the property right directly from the applicant. The applicant is the only party in the patent system who, *ex ante*, knows the boundaries of the property that is believed to have been invented. We also generally expect the applicant to have some understanding of his commercial goals for the property and have some understanding of how is invention nestles within the prior art.[70] Thus, by drawing on the applicant, the cheapest cost provider of information concerning boundaries of the property, positive examination reduces the extent to which the Patent Office needs to direct resources to the task of seeking information concerning the boundaries of the property. In cooperative fashion, positive examination helps to specifically inform the applicant about which attributes and qualities of the invention are poorly understood by the examiner. This is expected to benefit the Patent Office because it helps the applicant more specifically provide information useful to the examiner, increasing the efficiency of prosecution.

Positive examination benefits the Patent Office because it requires examiners to spend at least some amount of time directly considering the full

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[70] Undoubtedly, different applicants will have varying degrees of understanding of these points. For instance, it is certainly true that the Patent Office does not require that applicant search for—and therefore know the substance of—the prior art. Even so, it is not unreasonable to expect that applicants will generally know more examiners on these points.

boundaries of the property for which an applicant seeks exclusive rights. In addition, the more clearly the examiner understands the boundaries of the property being examined, the more efficiently he can search for prior art, since less time will be spent pursuing irrelevant information. The combination of better knowledge concerning the boundaries of the property being examined, and a more efficient search for prior art should result in an improved likelihood that the Patent Office will make the correct decision on patentability.[71]

The Patent Office can more effectively perform its function as guardian of the public domain if it employs positive examination. By implementing positive examination, the harm of Patent Office mistakes in substantive decision making may be reduced. When the boundaries of the property are more clearly in the record, patentees and competitors may be able to more reliably determine whether the patent is narrow, weak, or likely to be held invalid. In some situations then, positive examination can increase the possibility of *ex post* private party resolution of erroneous Patent Office decisions.

In addition, a record that better sets forth the boundaries of the property being examined will be of great assistance to examiners who need to relearn the subject matter of applications years after first action. Positive examination will also assist examiners in understanding the prior prosecution in old cases that they inherit from other examiners. Moreover, records containing more information precisely targeted to defining the boundaries of the patented property will be more useful to the Patent Office in reexamination proceedings and useful to Administrative Patent Judges (or other decision makers) in the event some sort of post-grant opposition is ever implemented.

2. Benefits to the Patent Applicant

Although the patent applicant must work a little harder in positive examination, he also receives a benefit. Positive examination reduces information costs to the applicant because it provides the applicant with information explaining the examiner's view of the contours of the property right the applicant is seeking. Seeing those contours should be important to applicants because it permits applicants to fine tune their response to rejections the Patent Office might make. Thus, the applicant, who knows vastly more than the examiner about the property right he seeks to obtain, can correct an examiner's misinterpretation of the scope of that right, easily traverse rejections that are incorrect in

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[71] As noted earlier, this does not mean perfection. There are still other reasons why the Office's substantive decision making might still go awry.

light of the proper scope, and focus examination on those aspects of the property right that are most likely to be the source of dispute.[72]

3. Benefits to Competitors

As noted above, the information costs associated with ascertaining the boundaries of the patented property are not extinguished when a patent issues. By reducing the information deficits surrounding the boundaries of the patented property, positive examination should make competitors' comprehension of the boundaries of the property more certain. As a matter of theory, the more certain the boundaries of the property, the lower the transaction costs associated with avoiding infringement. Competitors are more likely to correctly predict whether their conduct falls inside or outside the boundaries of the patented property. Moreover, should events require it competitors are more likely to correctly evaluate their case for invalidity. Improving the certainty of the boundaries of patented property may also help those competitors who license or purchase more accurately evaluate the value of their investment.

4. Benefits to the Courts

As noted above, under the current doctrinal rules extrinsic evidence is disfavored as a source of interpretive guidance for the purpose of establishing the legal boundaries of patented property.[73] Thus, in defining the boundaries of patented property, courts, like competitors and post-issuance patentees are largely cut off from much art-based information useful for defining the boundaries of the property. While this approach conserves on the cost of information because it limits what information is available for guidance, it can also impose a huge information cost in terms of ambiguity in cases where the intrinsic record does not meet even the basic threshold of sufficiency. When the basic threshold of sufficiency is not met, different cognitive actors, including courts, cannot reliably reproduce a consistent comprehension of the boundaries of the pro-

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[72] Some applicants may not desire the clarity and coherence of the scope of the property right that follows from positive examination. Naturally, to the extent that applicants prefer a high degree of ambiguity surrounding the definition of the property right, they will not view positive examination as having the described benefits.

[73] *Phillips*, 415 F.3d at 1317-19; *Vitronics*, 90 F.3d at 1582 ("In most situations, an analysis of the intrinsic evidence alone will resolve any ambiguity in a disputed claim term. In such circumstances, it is improper to rely on extrinsic evidence.").

tected property.[74] For reasons that are now more than apparent, positive examination can only help make more likely that courts and cognitive actors will more reliably and predictably comprehend the scope of patented property.

5. Benefits to the Public

The public benefits from positive examination in at least three general ways. First, the public gets better disclosure of the invention in which it invested. This increases available information, the tool necessary for further innovation. Second, the public benefits from enhanced innovation. Because patent applicants must provide greater disclosure, and because the above-referenced competitors can more safely undertake efforts to design around the patented invention, the public innovation should theoretically both accelerate and diversify. Third, the public is expected to benefit by a reduction in the cost of goods and services comprising patented products because transactions underlying the creation, production, and marketing of those goods and services may proceed at lower cost in an environment of positive examination.

C. The Costs of Positive Examination

What positive examination does is improve the informational quality of the intrinsic record by an approach specifically targeted to provide critical information on the precise issue of what are the boundaries of the property for which an applicant seeks the right to exclude. Positive examination is not, however, a panacea. Rather, positive examination is a low cost procedural tool that could be implemented alone or as a complement to other approaches such as increasing the skill and number of the examining corps, calls by others that the applicant be required to provide certain additional types of information,[75] and

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[74] This phenomenon may contribute to the high reversal rate on the issue of claim construction at the Federal Circuit. As noted *ante*, the Federal Circuit's reversal rate on this issue is as high as fifty-percent. Chu, *supra* n. 40, at 1098. Regional circuits, on the other hand, reverse district court at a rate of 7-10 percent. And, while some component of the reversal rate seen at the federal circuit may well be attributed to the complexities of patent law's diverging interpretive paradigms, *see* Wagner & Petherbridge, *supra* n. 38, as applied to ever more complex technologies, another portion might be attributed to the fact that both the trial court and the reviewing court are deciding the scope of the property right on vastly insufficient information.

[75] *See e.g.* Joseph Scott Miller, *Enhancing Patent Disclosure for Faithful Claim Construction*, 9 Lewis & Clark L. Rev. 177, 201, 206 (2005) (proposing that the applicant include with his filing a statement of the field of art, the problem that the invention solves, a list of objective reference sources, and a list of explicit definitions of terms to which the inventor attaches

perhaps someday, some form of post-grant opposition. At its core, it requires an express discussion between the applicant and the Patent Office concerning the boundaries of the property that is to be examined and perhaps later litigated. What it permits is a clearer understanding of what the property is, and how the Patent Office viewed the property as allowable subject matter.

In some cases, positive examination will dispositively address attributes of the property that would have been litigated and prevent litigation. In other cases, positive examination will incompletely address attributes of the property that would have been litigated, but will have improved the information concerning those attributes to a level sufficient to drive settlement. In still other cases, positive examination will miss altogether the attributes of the property that later become important in litigation. Thus, positive examination behaves as a filter that will catch and remove costs from some transactions, by not catch and not remove costs from others. One way to consider whether positive examination will be wealth maximizing is to consider what it will cost the patent system.

According to recent reports, the examining corps numbers roughly 3,000 examiners.[76] Approximately 1,000 applications are filed every working day for a total of roughly 300,000 new applications every year,[77] a number that increases approximately 10 percent every year.[78] Given the ratio of examiners to applicants it should come as no surprise that patent examiners spend anywhere from 8-25 hours on each application.[79] Even so, the Patent Office's 3,000 examiners allow 167,000 patents every year.[80]

Leaving aside the cost of judicial resources and the time lost by corporate employees involved in a case, the cost of patent litigation *alone* is estimated to be somewhere north of $2 billion per year in the United States.[81] Estimates reflect, however, that litigation involves only about 1.5 percent of all patents.[82] By Professor Lemley's estimates, an additional 3.5 percent of patents are subject to licensing each year. Based on the assumption that each licensing transaction

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"other-than-ordinary-meaning."); Mark Lemley, *Rational Ignorance at the Patent Office*, 95 Nw. U. L. Rev. 1495, 1523-31 (2001) (listing some suggestions for improving Office processes).

76 *See* To Promote Innovation, *supra* n. 2, at 10.

77 *Id.* at 9-10.

78 *Id.* at 9.

79 *Id.* at 10; *see also* A Patent System for the 21st Century, *supra* n. 2, at 51 (testifying that examiners spend between 15 and 30 hours per application).

80 *See* A Patent System for the 21st Century, *supra* n. 2, at 48.

81 Lemley, *supra* n. 75, at 1501.

82 To Promote Innovation, *supra* n. 2, at 12.

sums to approximately $100,000, Professor Lemley estimates the total annual cost of licensing is something greater than $500 million.[83] Thus, assuming conditions have not changed[84] litigation and licensing account for over $2.5 billion annually.

Let us now consider the potential impact of positive examination to get an idea of the welfare benefit it could provide. As a hypothetical, suppose that the average patent examiner makes $75,000 per year. Assuming a forty-hour work-week, that examiner's time is worth roughly $40 per hour. Assume next that it will take the average examiner thirty minutes to complete the positive examination claim chart—to commit to writing his understanding of the boundaries of the patented property. Sticking with our estimates, thirty extra minutes costs $20 extra. Assuming 300,000 applications per year, the net cost to the Patent Office is $6,000,000.[85] Although thirty minutes should be a reasonable estimate given the current requirements of examination, if the task were to take one hour instead of thirty minutes, the cost to the Office would double to $12,000,000.

Twelve million dollars is not quite 0.5% of the total estimated cost of licensing and litigation. Accordingly, if positive examination could eliminate three median patent litigations,[86] or 12 licensing deals[87] it will from one perspective have paid for itself. Moreover, it is easy to imagine that positive examination, even where it does not eliminate these transactions, can have the effect of reducing the cost of some of these transactions.

Up to this point, we have not considered the cost of positive examination to the applicant. In many ways the cost to the applicant of improving the quality of the disclosure on the point of defining the boundaries of the property is hard to determine. For instance, we do not know how much time some applicants spend intentionally trying to make applications as ambiguous and obtuse

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83 *Id.* at 11-12.

84 These estimates, reported in 2001, operated off assumptions of fewer applications and fewer issues; accordingly current dollar values are in all likelihood even higher.

85 This naturally does not include the costs associated with establishing the procedure, which might include a software change or upgrade, the costs of informing the examiner and parties of the requirement, and other sunk costs.

86 *See* Am. Intell. Prop. Assn. L. Prac. Mgt. Comm., *Report of the Economic Survey 2003* 22 (Fetzer-Kraus, Inc. 2003) (estimating that the median patent litigation in which $1 million to $25 million is at stake costs approximately $4 million) (cited in Joseph Farrell & Robert P. Merges, *Incentives to Challenge and Defend Patents: Why Litigation Won't Reliably Fix Patent Office Errors and Why Administrative Patent Review Might Help*, 19 Berkeley Tech. L. J. 943, 948 (2004)).

87 Based on Professor Lemley's estimate.

as possible. Generally, positive examination drives applicants to provide initial filings that are a better objective source for determining the boundaries of the property. By way of example, applicants who would decrease their disclosure in an effort to "free-ride" on the Office's work should be rightfully concerned that ill-considered and uninformative disclosures will not act to establish a critical date (*i.e.*, will not describe) for the property they seek. However, applicants who improve the part of their application that is directed to defining the boundaries of the property may ultimately pay less for the prosecution of that application because they will not suffer the additional costs of responding to irrelevant rejections and correcting examiner misunderstandings. Thus, assuming it takes a little extra effort to expressly define the meaning of claims in a patent application, that effort may be rewarded by more efficient prosecution.

For purposes of discussion, however, let us assume that positive examination does add a net cost to the preparation of applications. Much like the cost to examiners, this cost involves comprehending and committing to paper information sufficient to convey what the boundaries of the property at issue actually are. On average the typical patent agent or attorney spends 20-40 hours preparing an initial application. Generally speaking, patent agents and agent-attorneys cannot bill at the same rates as patent litigators. Moreover, some clients will refuse to pay more than a certain amount for each issued patent. If we consider in combination all of the entities that prepare patent applications, including inventors themselves, independent patent agents, in-house patent agents, and both in-house and independent agent-attorneys, we may assume as a high estimate, an average billable rate of $150 per hour.

It is not unreasonable to assume that patent applicants have (or ought to have) a fairly definite and clear understanding of what property it is that they think they have conceived and created.[88] Accordingly, it is not unreasonable to assume that they have as good a chance as anyone at clearly committing this understanding to paper. Therefore, given all the considerations above, the following estimate may be very high, but let us assume that positive examination adds a net hour to the preparation of the initial application. Again, assuming 300,000 new applications a year, that amounts to cost of $45 million.[89]

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[88] Indeed, one might question the wisdom of awarding a patent at all to an applicant who has so poor an understanding of the boundaries of the property that comprises the invention that it cannot be readily and clearly set forth.

[89] It should be noted that this additional cost might have the cost-lowering benefit of reducing applications, and the attendant costs where applicants discern that such applications are frivolous and would result in weak or possible invalid or unenforceable patents.

We might additionally assume that positive examination could add some time to a Response.[90] One expects that the time would be quite little given that the applicant has already seriously considered the boundaries of his property at least once, and given that the applicant has the claim chart filled out by the examiner to guide his evaluation of the examiner's action. However, assume an additional thirty minutes of work in the first response. In other words, and additional $75 dollars in the course of prosecution, and, assuming $300,000 applications, a total $22.5 million to all applicants combined.

Summing an assumed $12 million at the Office, an assumed $67.5 million for patent applicants, and leaving out the costs sunk in implementing the procedure, a liberal estimate of the yearly cost of positive examination is $79.5 million. According to one commentator, who has set forth a valuable proposal,[91] which although it provides less-directed information than positive examination may be similar in cost, if the costs of any implemented changes remained below $110.8 million a net cost improvement would be realized.[92]

III. MODES OF IMPLEMENTATION

A. Regulation: The Preferred Embodiment

It is likely that the Office could implement positive examination without obtaining, promulgating, or enacting any new rules. Recently, the Office promulgated and enacted Rule 105.[93] Rule 105, entitled "Requirements for Information" states as follows:

> (a)(1) In the course of examining or treating a matter in a pending or abandoned application filed under 35 U.S.C. 111 or 371 (including a reissue application), in a patent, or in a reexamination proceeding, the examiner or other Office employee may require the submission, from individuals identified under § 1.56(c), or any assignee, of such information as may be reasonably necessary to properly examine or treat the matter.[94]

The rule then sets forth a number of examples of information that the Office may seek from an applicant.

For instance, the Office is entitled to request information concerning whether the applicant performed a search, and what were the results of that

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90 A Response is the applicant's written reply to an Office Action.

91 *See* Miller, *supra* n. 75, at 199.

92 *Id.*

93 37 C.F.R. § 1.105.

94 *Id.* at § 1.105 (a)(1) (emphasis added).

search.[95] The Office may additionally seek non-patent literature from the applicant that "relates to the claimed invention,"[96] that was "used to draft the application,"[97] "that was used in the invention process, such as by designing around or providing a solution to accomplish an invention result,"[98] or "[w]here the claimed invention is an improvement, identification of what is being improved."[99] The Office may require information pertaining to "any use of the invention . . . known . . . at the time the application was filed,"[100] or "[t]echnical information known to applicant concerning the related art, the disclosure, the claimed subject matter, other factual information pertinent to patentability, or concerning the accuracy of the examiner's stated interpretation of such items."[101]

Rule 105 additionally permits the Office to require "factual information"[102] and seek such information through either normal communications or via interrogatories[103] and requests for stipulations.[104] Moreover, to the extent the applicant knows the information sought and can readily access and transfer that information to the Office,[105] the applicant must do so.

Moreover, this rule has been recently tested in litigation. In *Star Fruits S. N. C. v. U.S.*,[106] the appellant's patent application went abandoned for failure to respond to a requirement for information. In considering the application of the necessary to properly examine or treat the matter standard, the court cast the requirement in terms that implicate a discovery-type standard, reviewable under the arbitrary and capricious standard of the Administrative Procedure Act[107]:

> So long as there is some legitimate reason for seeking the information under *section 1.105*, the applicant has a duty to respond. If the examiner deems the information sought pertinent to the legal inquiry the examiner must conduct, .

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95 *Id.* at § 1.105 (a)(1)(i)-(ii).

96 *Id.* at § 1.105 (a)(1)(iii).

97 *Id.* at § 1.105 (a)(1)(iv).

98 *Id.* at § 1.105 (a)(1)(v).

99 *Id.* at § 1.105 (a)(1)(vi).

100 *Id.* at § 1.105 (a)(1)(vii)

101 *Id.* at § 1.105 (a)(1)(viii).

102 *Id.* at § 1.105 (a)(3)(i).

103 *Id.* at § 1.105 (a)(3)(ii).

104 *Id.* at § 1.105 (a)(3)(iii).

105 *Id.* at § 1.105 (a)(4) (stating "any reply to a requirement for information pursuant to this section that states either that the information required to be submitted is unknown to or is not readily available to the party or parties from which it was requested may be accepted as a complete reply").

106 393 F.3d 1277 (Fed. Cir. 2005).

107 *Id.* at 1281; *see* 5 U.S.C. §§ 702-706.

> . . [t]he Office is authorized under section 1.105 to require any information that is either relevant to patentability under any nonfrivilous legal theory, or is reasonably calculated to lead to such relevant information. . . . [T]he applicant may challenge that decision under the APA. The scope of APA review is not . . . to test the examiner's theory of the case . . . . The district court, on APA review, does not enmesh itself in the decision-making process of the examiner. Its function, instead, is simply to guard against the possibility of arbitrary or capricious behavior by examiners in seeking information.[108]

Although in *Star Fruits S.N.C.* the information the applicant refused to provide information related to validity, the reasoning of the case applies with equal force to information concerning the scope of the claims.[109] As set forth by the Federal Circuit:

> The Office is clearly entitled to use section 1.105 to seek information that may support a rejection. Just as the applicant produces information it deems pertinent to patentability under section 1.56, the examiner is free to request information under section 1.105 that the examiner deems pertinent to the issue of patentability. In this case, the dispute over whether Star Fruits should be compelled to answer the examiner's Requirement For Information under section 1.105 boils down to a disagreement between Star Fruits and the examiner as to the significance of the information sought to the ultimate question of whether Star Fruits's application discloses patentable subject matter.[110]
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> The Director is charged with the duty of deciding whether a patent should issue from an application. To perform that duty, the law must be applied to the facts at hand in any application. That the person charged with enforcement of the law, here an examiner, may sometimes disagree with the applicant on the theory or scope of the law to be applied is hardly surprising. So long as the request from the examiner for information is not arbitrary or capricious, the applicant cannot impede the examiner's performance of his duty by refusing to comply with an information requirement which proceeds from the examiner's view of the scope of the law to be applied to the application at hand. To allow such interference would have the effect of forcing the Office to make patentability determinations on insufficient facts and information.[111]

Because under any reasonable view, information concerning the boundaries of the property for which the applicant seeks the right to exclude is information necessary to properly examine or treat the matter, the Office already has the procedural tool it needs to implement positive examination.[112] If some-

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108 *Star Fruits S.N.C.*, 393 F.3d. at 1284-85 (emphasis added).

109 *Id.* at 1283.

110 *Id.*

111 *Id.* at 1283-84.

112 Although individual examiners are already capable, an official office policy to use Rule 105 for positive examination could be implemented.

how Rule 105 were deemed insufficient for the task, the Office has statutory authority to "establish regulations, not inconsistent with law, which—(A) shall govern the conduct of proceedings in the Office."[113] As the Federal Circuit recently reiterated in *Stevens v. Tamai*,[114] by enacting section 2, Congress delegated to the Office plenary authority over Office practice.[115] Thus, if the Office needed a different rule, it certainly has the power to promulgate such a rule, although as final recourse, if needed, the Office could look to Congress to obtain either substantive rulemaking authority, or a specific addition to Title 35 implementing positive examination.

B. Review

In terms of appellate review of district court claim interpretations, because positive examination generates information in the intrinsic record, it does not require that standards of review be altered or made more deferential.[116] If anything, it should support consistent and meaningful review under the current de novo standard.[117] It may even help reduce the high reversal rates currently exhibited by the Federal Circuit,[118] and might help mitigate the consequences of the currently diverging methodological approaches to claim interpretation, which seem to contribute the Court's high reversal rate.[119]

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113 The Office already has other more specific procedural rules that require information from applicants. 35 U.S.C. § 2(b)(2)(A); Miller, *supra* n. 75, at 193, (noting that the office requires applications to be in the English language.) (citing 37 C.F.R. § 1.52(b)(ii)); *see also* Cotropia, *supra* n. 53, at 61-62 (discussing statutory and regulatory requirements).

114 366 F.3d 1325, 1333 (Fed. Cir. 2004); *see also Merck & Co. v. Kessler*, 80 F.3d 1543, 1549-50 (Fed. Cir. 1996) (explaining that the Office has procedural, but not substantive rulemaking authority).

115 *Stevens*, 366 F.3d at 1333.

116 That is not to say that there are no arguments that generally support some deference. *See* Phillips, 415 F.3d 1303 at 1330 (Lourie, J. dissenting in part and concurring in part, Mayer, J. dissenting) (Mayer, J. arguing in dissent that there is a heavily factual component to claim interpretation worthy of appellate deference); *see also* John F. Duffy, Patent Law and Policy Symposium: Re-engineering Patent Law: The Challenge of New Technologies: Part I: Administrative Law Issues: On Improving the Legal Process of Claim Interpretation: Administrative Alternatives, 2 Wash. U. J.L. & Policy 109 (2000) (discussing the sometimes competing principles of national uniformity and procedural cost).

117 *See Markman v. Westview Instruments, Inc.*, 517 U.S. 379 (1996); *Cybor Corp. v. Fas Techs., Inc.*, 138 F.3d 1448 (Fed. Cir. 1998).

118 *See* Chu, *supra* n. 40, at 1121; Moore, *supra* n. 40, at 14.

119 Indeed, the diverging approaches may be explainable not only as differing perceptions as to the primacy of claim language, but also as an attempt to deal with information costs. Where written descriptions and prosecution histories fail to provide information sufficient for the

However, positive examination could have some implications for appellate review of district court claim interpretations. For example, positive examination may support a Skidmore-like deference of district court claim interpretation. In some cases, positive examination will produce a record that is both rich and on point to the subject matter in dispute. In such cases, assuming the district court's order reflects a thorough and well-reasoned evaluation of that record it might be accorded deference even where the record itself did not completely foreclose an appellant's theory of construction.[120] In other cases, where the record is of low quality, or fails to address the relevant boundary issues, less deference may be appropriate.[121]

Positive examination has some interesting implications for review of cases before the Board. For example, in *ex parte* cases the Board is reviewing the validity of the examiner's actions. Such actions may include rejections due to anticipation or obviousness.[122] When considering whether the Board properly interpreted the claims, where the applicant has clearly had the opportunity to establish precisely those boundaries that are the subject of dispute, it would seem appropriate to award the Board some deference on the question of whether the applicant established those boundaries to the Office's satisfaction. Such a review would complement positive examination because it would allow the Board to determine, and therefore police to some extent, whether applicants had

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court to fully reconstruct the boundaries of patented property, the court must pay the cost of information. Diverging methodological rules may in part reflect normative judgments on how to economize information costs. For instance, the procedural approach claim construction may better serve the public notice function of claiming, economizing the systemic cost of information. In contrast, the holistic approach may serve to economize the judicial cost of information at the expense of systemic cost. *See* Wagner & Petherbridge, *supra* n. 38, at 1112.

120 It may well be that this already occurs as a matter of course. *See* Paul Michel, *Judicial Constellations: Guiding Principles as Navigational Aids*, 54 Case W. Res. 757, 761 (2004) (explaining that "review is not really de novo after all" because where a district court interpretation is careful, detailed and not clearly at odds with the other intrinsic evidence is it likely to be affirmed").

121 Although this may depend on why the record is poor. If the applicant clearly participated, but the prosecution dialog simply never reached the specific boundary issues that are the subject of the appeal, deference might still be warranted assuming a well-reasoned order. However, where the record is highly deficient in relevant information, perhaps a more plenary look by the appellate court is appropriate.

122 35 U.S.C. § 134; 37 C.F.R. 41.50 ("(a)(1) The Board, in its decision, may affirm or reverse the decision of the examiner in whole or in part on the grounds and on the claims specified by the examiner.").

set forth the boundaries of their property in a manner sufficient to objectively convey those boundaries to the hypothetical skilled artisan.[123]

In terms of substantive decision making, positive examination probably does not present a strong argument in favor of increasing the deference district courts give to Patent Office decision making.[124] It is true that generally speaking positive examination should improve Office substantive decision making in the sense that there is a better chance the examiner will reach the correct conclusion. This would seem to support greater deference. However, the decision to allow a patent is important, and the substantive law so difficult to apply, that it in the view of the author it still makes sense to maintain de novo review.

C. Complementarity

Positive examination complements a whole host of other proposed patent system improvements. First and foremost, the quality of examination is unlikely to improve until examiners better obtain and use information about the contours of the property right that they are granting. This suggests that recommendations that the Office hire more examiners[125] will at best be only partially successful until all examiners are better able to understand the scope of property they are considering. If this does not improve, having more examiners will only result in more examiners making the same, sometimes erroneous, decisions that result in questionable patents. In addition, hiring more examiners will probably result in more patents issuing. If those patents do no better than current patents in terms of setting forth information necessary to determine the boundaries of patented property, the "solution" of hiring more examiners could easily increase systemic transaction costs.

Second, absent positive examination, recommendations calling for improved examination on the obviousness element of patentability will likely be ineffective. It is unreasonable to expect that examiners can make better judgments on the issue of obviousness (or for observers to think they are making better judgments) when the boundaries of the property at issue are not clear. Moreover, because examiners do not provide direct information, it is very difficult to know what property examiners are examining. Consequently, those who

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123 Also called the "Person Having Ordinary Skill In The Art", sometimes known as the PHOSITA.

124 Although it might make the current clear and convincing evidence standard necessary to prove invalidity at least slightly more justifiable.

125 *See e.g.* Rai, *supra* n. 9, at 218.

study the patent system will have a very difficult time determining whether quality is improving or not.[126]

Third, because validity depends on the quality of examination and the quality of the record of that examination, recommendations to create and insert into the patent system an additional judicial forum of administrative patent judges to litigate the validity of issued patents, may be of limited usefulness if examination does not improve. In fact, post-grant review, if not carefully constructed might be not only costly, but detrimental. Where post-grant review may fix a patent as "valid," it may not have done much work in terms of defining the boundaries of that "valid" patent. This is because by focusing on validity, the decision-maker focuses on the boundaries of the property only in terms of the art that is presented. Therefore, post-grant review, while reducing the *ex post* cost of determining which patents are valid, may be of no greater assistance (although likely of a greater cost) than positive examination for establishing the boundaries of the patented property. In many cases, whether competitive or public conduct constitutes infringement may be nearly just as open a question after post-grant review as it was before. Unfortunately, depending on the form of post-grant review, the ability to invalidate a patent after learning more about its legal boundaries may be limited.

IV. CONCLUDING REMARKS

While many commentators view low quality patents as a problem of Patent Office substantive decision making, it is useful to consider that decision making not from the perspective of whether patent examiners are smart enough, are properly incentivized, or have sufficient time to cogitate on the merits of the very difficult decision of whether claimed property is unobvious, but, instead, from the perspective of whether the Office may perform that decision making on incomplete and/or misleading information. In other words, questionable patents may be merely a symptom of a much deeper systemic problem, *i.e.*, a comparative lack of focus on efficiently collecting and making public information useful for defining the boundaries of patented property. Put differently, a lack of attention to efficiently collecting as much information as possible productive for establishing the meaning of the claims. It is no doubt true that sometimes a discourse concerning prior art can imply certain information about what

[126] This assumes a relatively rational and rigorous approach to the question of quality. If the test of quality is a gut reaction to the subject matter of the patent, *e.g.* the issue of a patent directed to swinging on a swing or a sandwich sealing method equals low quality, then perhaps a different approach to improving the patent system might be warranted.

claims mean. Generally, however, removed discussions concerning the import of prior art is unlikely to generate high amounts of quality information productive for establishing the legal boundaries of patented property.[127] That being so, perhaps it is time to spend less time during prosecution talking about prior art, and more time talking about the details of the boundaries of the property sought.

As set forth *ante*, an important aspect of the Office's function is collect the information that defines the property right in order to engage and conclude the substantive decision making that attends the decision to grant the right in the first place. After a patent is granted, however, all institutional and public participants in the patent system rely on the Office's decision to collect, or not collect as the case may be, information concerning the scope of the property right. Thus, the Office's decision making with respect to information drives the allocation of information costs for those participants in the patent system who participate post-grant. Although rational conduct may support limiting costs incurred for each patent filed, by recognizing that the Office serves an important allocative function we can explore Office behaviors from a different perspective.

From that perspective, perhaps we should not overweight as a measure of success the ability of the Office to correctly make the obviousness judgment. Our external ability to measure the Office's success at this task is limited. This being the case, perhaps we should seek success farther up the informational chain. What we can control, and what positive examination makes clear we can improve, is the Office's information collection and recordation functions. Moreover, for the reasons discussed above, improvements in those functions that increase the quantity and quality of information concerning the specific boundaries of patented property can be reasonably expected to improve systemic information costs by increasing the clarity of the property right. Accepting that, perhaps the measure of success should be how effectively the Office creates a record that permits the Office as well as *ex post* actors to better understand the boundaries of patented property. That goal is reasonable, and if met improved substantive decisions could be expected to follow.

After considering the implications of the Office's information cost allocation function, this Article proposes a very practical, theoretically sound, cost effective improvement that, if implemented, should pay large, patent system-

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[127] This is further made clear when practitioner strategic conduct is considered. *See* Richard A. Killworth, *Strategic Prosecution Tactics*, in State Bar of Texas, 17th Annual Intellectual Property Law Course Chs. 10, 1, 3 (2004) (giving numerous examples of how to overcome substantive rejections "without arguing that any claim limitation distinguishes patentability over a reference" and "*without ever arguing the merits of the claimed invention*" (emphasis in original)).

wide dividends. The improvement comprises a small modification to the examination procedure that significantly enhances the public record. By reducing the information deficiencies that attend the examination process and, ultimately, the protected property, the improvement reduces impact of transaction costs on the institutional players, patent applicants, competitors, and perhaps most importantly, the public.