

Conflicting Theories of Equivalence: 35 U.S.C. § 112, P6 in the Supreme Court and the Federal Circuit

Cyrill P. Rigamonti *

* Lic. iur., University of Zurich, Switzerland; LL.M., Georgetown University Law Center. The author gratefully acknowledges Professor James V. Feinerman, Georgetown University Law Center, for his supervision of the author's LL.M. research.

I. INTRODUCTION

The Supreme Court's recent decision in *Warner-Jenkinson Co. v. Hilton Davis Chemical Co.* n1 is not only a landmark case concerning the doctrine of equivalents, it is also the first Supreme Court case commenting on 35 U.S.C. § 112, P6, one of the most troublesome sections in the Patent Act of 1952. This provision reads:

An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof. n2

In *Warner-Jenkinson*, the issue was whether this provision constitutes a congressional negation of the doctrine of equivalents; the Supreme Court held that it does not. In reaching its decision, the Court discussed 35 U.S.C. § 112, P6 and explained that it "is an application of the doctrine of equivalents in a restrictive role." n3 This statement would not be of further interest if it did not squarely contradict the Federal Circuit's reading of the same provision in *In re Donaldson Co.*, n4 a recent en banc decision holding that 35 U.S.C. § 112, P6 is not limited to post-issuance

[*164] claim interpretation. n5 In *Donaldson*, the Federal Circuit saw "no merit" and "no support" for the proposition that 35 U.S.C. § 112, P6 was a codification of the reverse doctrine of equivalents. n6

Since the Court's statement in *Warner-Jenkinson* was only dictum, *Donaldson* was not technically overruled, and its holding remains good law. However, the two irreconcilable statements reveal that the Supreme Court and the Federal Circuit rely on two completely different theories when reading 35 U.S.C. § 112, P6. In an attempt to provide the law of means-plus-function claims with a consistent theoretical foundation, this article will 1) show the propriety of the Supreme Court's theory based on an analysis of the history of functional claiming and the statutory language; 2) explore the reasons for the Federal Circuit's application of a different theory and its ramifications; and 3) conclude that it is time for congressional intervention in favor of the Supreme Court's approach to 35 U.S.C. § 112, P6.

II. FOUNDATIONS OF THE SUPREME COURT'S APPROACH

In order to understand 35 U.S.C. § 112, P6 and to determine the merits of the Supreme Court's theory underlying its statement in *Warner-Jenkinson*, an inquiry into the reasons for the existence of 35 U.S.C. § 112, P6 and the concepts it incorporates is indispensable.

A. *Why 35 U.S.C. § 112, P6? The Halliburton Trigger*

At first glance, 35 U.S.C. § 112, P6 appears to be superfluous. U.S. patent law obligates patent applicants to define their inventions. n7 Unless applicants are free to choose whatever type of language they think best defines their inventions, some applicants may not be able to fulfill this statutory obligation. Accordingly, it makes sense to allow any type of language, unless it is explicitly forbidden, and that is why the statute does not contain a list of acceptable claim formats. Therefore, the explicit authorization of the use of particular claim formats by statute in 35 U.S.C. § 112, P6 for means-plus-function claims seems unnecessary. At the very least, the existence of this provision calls for further explanation.

[*165] Regrettably, there is no legislative history available that would explain the reasons for which 35 U.S.C. § 112, P6 was enacted. Neither the House Report n8 nor the Senate Report n9 addresses this provision, which is rather remarkable given the fact that it was a completely new provision that was enacted for the first time in 1952 and was not just carried over from a previous Patent Act. However, courts generally recognize n10 that Congress enacted 35 U.S.C. § 112, P6 in response to *Halliburton Oil Wells Cementing Co. v. Walker*. n11 This decision cast some doubt on the propriety of functional claim language in general, when it invalidated a claim under the Patent Act of 1870 on the sole basis that it used "conveniently functional language at the exact point of novelty." n12

While it is plausible that *Halliburton* triggered the enactment of 35 U.S.C. § 112, P6, n13 a closer look at the statutory language reveals that the *Halliburton* theory only explains the existence of one part of the provision. The first clause of 35 U.S.C. § 112, P6, which provides that "an element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof," would have been sufficient to overturn *Halliburton*. In other words, the first clause of 35 U.S.C. § 112, P6 makes it clear that there is no ground for objecting to a claim on the basis of any language beyond what is already sanctioned by 35 U.S.C. § 112, P1 & 2. n14 There was no need for a second clause specifying that "such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof." n15 By attaching a second clause, Congress went beyond a mere *Halliburton* cure. As a result, the explanation generally employed by the courts, that 35 U.S.C. § 112, P6 is nothing other than a *Halliburton* cure, is only partly satisfactory, namely with respect to the first clause. The existence of the second clause remains unexplained, which is particularly troublesome,

[*166] because it is the second clause that gives rise to the conflicting theories addressed in this article.

The second clause of 35 U.S.C. § 112, P6 is the only provision in the Patent Act that uses the word "equivalents." n16 Therefore, it will hereinafter be referred to as the "equivalents clause." Since the controversial "doctrine of equivalents" does not have a statutory basis, applies in a similar context as the equivalents clause, and was known long before the enactment of the equivalents clause, the statutory use of the keyword "equivalents" lends itself to the inference that there is at least some connection between the two. Therefore, in the absence of any legislative history or judicial explanation of the equivalents clause, a historical exploration of the concepts of means-plus-function claims and the doctrine of equivalents is necessary.

B. Historical Perspective of Means-Plus-Function Claims

1. Origin of Means-Plus-Function Claims

Since 1790, the law has maintained that every act of patent infringement requires a qualified use of a "patented invention." n17 This is still the law today under 35 U.S.C. § 271(a). n18 On this level of abstraction, the infringement inquiry appears rather trivial as the question is simply whether the accused object falls within the boundaries of the patented invention. However, determining the boundaries of a patented invention has become one of the most challenging issues in patent law. While the rules governing the description requirement have remained relatively unchanged since 1790, n19 the method by which these rules have been implemented in practice has changed significantly over time, reflecting an advanced understanding of the "nature" of inventions. Two hundred years ago, when an applicant's specification described a machine, the physical structure rather than the principle of operation was considered the invention. In today's language, one might say that

[*167] applicants two hundred years ago described the embodiments of their inventions rather than the invention itself.

The courts in this country soon realized that to promote the progress of the useful arts n20 and to do justice to the individual inventor, patent protection could not be limited to the particular embodiments described in the patent. Therefore, the courts developed an infringement analysis that would compare the described structure with the accused structure and apply a "different in principle" test. n21 This analysis was later labeled the "doctrine of equivalents." n22 When the need for a more distinct description of the invention arose, particularly in view of the frequent invalidation of issued patents for failure to distinguish properly the patented invention from the prior art, the description became a definition. n23 Step by step, the summarizing part of the specification turned into a definitional part--the claims. n24 Although this process was originally just a matter of good patent practice, the claims' full definitional force was later recognized by law with the adoption of the rule that anything disclosed in the patent, but not claimed, was deemed dedicated to the public. n25 Thus, under this rule, the claims define the invention. Of

[*168] course, this new rule dramatically increased the need for claim language that was broad enough to cover multiple embodiments, because describing all possible embodiments was practically impossible. A convenient way to achieve this goal, for machine inventions in particular, was to employ means-plus-function language, which describes what the invention does in terms of the function it performs, rather than what it is structurally. The desire to provide protection to more than just one embodiment gave birth to functional claims.

2. Historical Infringement Test

In terms of infringement, the rule set forth in *Miller* made sure that the doctrine of equivalents could no longer be applied to claims as patent practitioners understand them today. Whatever the patentee disclosed in the written description, but did not claim, was deemed dedicated to the public, and the doctrine of equivalents could not be used to recapture this material. This development, however, did not mean that the doctrine of equivalents had to be abandoned altogether. In the context of functional claiming, the structural elements were moved from the claims to the written description, and so was the application of the doctrine of equivalents. Instead of applying the doctrine to the function recited in the claims, it was applied to the structural *embodiments* described in the specification. To accommodate the new definitional role of patent claims, however, the overall infringement test had to be refined. The new rule that claims define the invention was incorporated into the infringement analysis as an additional requirement that had to be met *before* the doctrine of equivalents could be applied. Unless the accused object came within the meaning of the *claims*, there was no infringement. Once this threshold question was answered in the positive, the *Miller* rule was neutralized, and the courts could proceed to the infringement inquiry under the doctrine of equivalents. This overall test will hereinafter be referred to as the "historical infringement test."

The historical infringement test was fully consistent with the rule that the claim measures the invention, because if the accused structure was not within the meaning of the claim, it did not infringe. Thus, the doctrine of equivalents and the "metes and bounds" concept of patent claims did not conflict at this time. The claims were still the measure of the patent grant for validity as well as patentability. The Supreme Court

[*169] case of *Continental Paper Bag Co. v. Eastern Paper Bag Co.* n26 is a paradigmatic example of the law on means-plus-function claims as it was understood at that time. n27

3. *Continental Paper Bag*: The Supreme Court in 1908

In *Continental Paper Bag*, the patent in suit related to an improvement in paper bag manufacturing machines. n28 The allegedly infringed claim included the functional limitation "'operating means for the forming plate, adapted to cause the said plate to oscillate about its rear edge upon the surface of the cylinder during the rotary movement of said cylinder.'" n29

For purposes of validity, the Court did not refer to the written description or structural equivalence at all, but rather merely considered the claim language. n30 It recognized that the breadth of the claims would "imperil the patent, were the real invention less broad." n31 However, the Court found that the "operating means" distinguished the invention over the prior art, because nobody had previously combined the rotating cylinder and the forming plate due to the difficulty of operating a pivoted folding form upon the surface of a cylinder. n32 In other words, the "real" invention was indeed as broad as the claims, which is why the claims were held valid. The Supreme Court then turned to infringement. n33 The Court found that because the allegedly infringing structure performed the defined function, it came within the meaning of the claim, and the threshold requirement was met. n34 The Court then inquired into structural equivalence. n35 For that purpose, the Court established that the problem

[*170] the invention solved could structurally be achieved in one of two ways--either by causing the pivot of the folding plate to yield away from the cylinder, or by causing the surface of the cylinder to be depressed away from the folding plate. n36 The patentee disclosed the first device as the preferred embodiment, and the defendant used the second device. n37 The Supreme Court held that the accused structure was "within the doctrine of equivalents," n38 thereby upholding the infringement verdict.

In sum, the validity of functional claims was determined on the basis of the claim language, without reference to the written description, because the claim itself had to be patentable. However, the Court found infringement on the basis of an equivalence comparison between two structures--the one described in the written description and the allegedly infringing structure, n39 and it did so after establishing that the accused structure came within the meaning of the claims. n40 From a modern perspective, it is surprising that the Supreme Court invoked the doctrine of equivalents at all, given the fact that the claims admittedly read upon the accused device and therefore, in modern parlance, were "literally" infringed. The Court did so because at that time, structural equivalence between the described embodiment and the accused structure was the ultimate infringement test for functional claims. The "literal" infringement test, on the other hand, served only as a threshold test.

4. Analysis of the Historical Infringement Approach

a) Certainty and Flexibility in Infringement Determinations

The advantage of the historical infringement analysis, as evidenced by *Continental Paper Bag*, lay in the unique combination of two principles that usually contradict each other--*certainty* and *flexibility*. On one hand, the historical infringement test promoted certainty, because competitors could rely on the meaning of the means-plus-function claim as it was written, namely as covering "any" means, without engaging in uncertain equivalence inquiries. Competitors knew

[*171] that as long as they stayed outside the meaning of the claim, they could not possibly infringe, particularly in light of the fact that the doctrine of equivalents was not applied to extend the meaning of the claim at that time. On the other hand, the historical infringement test provided flexibility to the courts, allowing them to determine infringement, on a case-by-case basis, via an equivalence inquiry as of the time of infringement. This combination of certainty and flexibility enabled the courts to deny infringement if the accused structure could not genuinely be considered an embodiment of the invention, particularly if the accused structure employed technological developments that went beyond a mere substitution of equivalents. Hence, the infringement approach, as it evolved over decades, combined the relatively stable meaning of words in a claim and the flexible scope of the claim itself.

b) The Underlying Principle: Claim Meaning Over Claim Scope

The subtle balance between certainty and flexibility relies on a strict distinction between the meaning and the scope of a means-plus-function claim. Such a distinction will be necessary as long as the "literal" infringement analysis is not dispositive of the infringement issue due to the existence of a mandatory second prong incorporating some concept of equivalence. In other words, even if we know what a claim *means*, we still do not know whether it *covers* the accused subject matter. As this analysis is applied to means-plus-function claims, we know what the word "means" means and that it literally reads on any means that performs the function recited in the claim. However, we still do not know whether the claim covers a specific accused device, because unless the device is an equivalent to the structure contained in the specification, it does not. The distinction between meaning and scope is the key to an interpretation of the equivalents clause that is consistent with the doctrine of equivalents and the traditional principles of claim interpretation, such that the claim measures the invention. As will be shown below, the Federal Circuit's failure to adopt this distinction is the main flaw in the court's theory of 35 U.S.C. § 112, P6.

c) The Historical Doctrine of Equivalents as a Reverse Doctrine of Equivalents?

As a matter of principle, it should be noted that the historical doctrine of equivalents described above should not be confused with the

[*172] "reverse doctrine of equivalents," even if the Federal Circuit finds some analogy between the two. n41 The "reverse" doctrine of equivalents was a product of the Supreme Court's seminal decision in *Graver Tank & Manufacturing Co. v. Linde Air Products Co.* n42 In *Graver Tank*, the Court created a completely new doctrine of equivalents which applies to claims and which may either broaden or narrow the scope of the claim as compared to its meaning. The narrowing subtype of the *Graver Tank* doctrine of equivalents later received the label "reverse doctrine of equivalents." n43 Both the historical doctrine of equivalents and the new "reverse" doctrine of equivalents may result in a claim scope that is narrower than the claim meaning; however, one should not overlook the fact that the historical doctrine of equivalents does not apply to the claims but to specific structures disclosed in the written description. n44 Furthermore, the historical doctrine of equivalents is used to find infringement, while the modern "reverse" doctrine of equivalents is used to deny a finding of infringement, and thus might better be called the "doctrine of non-equivalence." n45 Therefore, the term "reverse doctrine of equivalents" should be reserved exclusively for the corresponding subtype of the new *Graver Tank* doctrine of equivalents, and it should not be confused with the historical doctrine of equivalents.

The Supreme Court's *Graver Tank* decision has not only complicated the terminology, it has fundamentally changed the historical infringement test by removing the threshold test of literal infringement. In recognizing that the new doctrine of equivalents may also be used to expand the claim scope beyond the claim meaning and that the doctrine may be applied even if there is no "literal" infringement, the Court has greatly diminished the significance of patent claims. As a result, the

[*173] modern doctrine of equivalents is applied as a mandatory second prong in every infringement case, n46 and not just in cases involving functional claims where the accused device has been found to perform the function recited in the functional claim.

C. The Equivalents Clause--Codifying the Historical Infringement Test

The conceptual similarity between the historical infringement test and the equivalents clause is striking. Both call for a structural equivalence inquiry in the context of means-plus-function claims, both apply the equivalence concept to the structure disclosed in the written description as opposed to the claims, and both require that the function recited in the claim is met before the equivalence concept becomes relevant. n47 Furthermore, the conceptual similarity is backed up by the language of the statute itself. 35 U.S.C. § 112, P6 contains three key words, which were only used in the context of infringement the years before enactment of the Patent Act of 1952. n48 First, there is the word "equivalents." As explained above, "equivalents" historically refers to the doctrine of equivalents as applied in the context of means-plus-function claims. n49 Second, the statute does not employ "to mean," but instead uses "to cover," which was generally used in the context of infringement at that time, and which does not suggest that the *meaning* of a means-plus-function claim depends on an inquiry into structural

[*174] equivalency. n50 Third, the statute relies on the expression "shall construe," which was frequently used to refer to infringement, before the Federal Circuit adopted this language and turned judicial "construction" into a synonym of general "interpretation." n51

In light of these findings, one comes to the inevitable conclusion that Congress actually codified the historical infringement test for means-plus-function claims when it drafted the equivalents clause of 35 U.S.C. § 112, P6. The historical infringement test had evolved over decades in the courts of this country. It had never been taken up by any statute, until *Halliburton* triggered the enactment of a provision on means-plus-function claims. While the first clause of 35 U.S.C. § 112, P6 was enacted to make sure that functional claiming remained available for U.S. inventors, Congress seized the opportunity to attach a second clause, codifying the balanced infringement test for means-plus-function claims in use at the time.

Consequently, the equivalents clause should be read as a rule to determine the scope of a means-plus-function claim in the context of infringement rather than as a rule to determine the meaning of such a claim, which would also apply in the contexts of patentability and validity. Furthermore, this reading fully comports with the nature of functional claims. Functional claims are claims for a class of structures defined by a common function. However, what is patented and claimed is not the function, but rather the structures that perform the function. In the case of infringement, the doctrine of equivalents is used to determine which structures, performing the recited function, belong to the patented class of structures and thus infringe the patent.

[*175] D. *The Supreme Court's Approach Revisited*

In light of the foregoing, the Supreme Court's reading of the equivalents clause was correct when it explained that,

Section 112, P6 now expressly allows so-called 'means' claims, with the proviso that application of the broad literal language of such claims must be limited to only those means that are 'equivalent' to the actual means shown in the patent specification. This is an application of the doctrine of equivalents in a restrictive role, narrowing the application of broad literal claim elements. We recognized this type of role for the doctrine of equivalents in *Graver Tank* itself. The added provision, however, is silent on the doctrine of equivalents where there is no literal infringement. n52

This statement is nothing other than an endorsement of the proposition that the equivalents clause is a codification of the *historical* doctrine of equivalents, i.e., the one which is sometimes imprudently analogized to the reverse or restrictive doctrine of equivalents. The Supreme Court confirms that the literal language of a means-plus-function claim embraces *any* means, even non-equivalent ones, that perform the recited function, but that the *application* of the literal language, not the language itself, is limited to equivalent means. In other words, the Court relies on the distinction between meaning and scope of the means-plus-function claim in reading the equivalents clause as a narrowing application of the broad literal claim language. The Court furthermore explicitly acknowledges that this principle is an application of the doctrine of equivalents, and thereby confirms the proposition that the equivalents clause applies in the context of infringement only. In stating that 35 U.S.C. § 112, P6 is silent where there is no literal infringement, the Supreme Court makes it clear that the equivalents clause relates to the *historical* doctrine of equivalents. It is the historical doctrine of equivalents which requires literal infringement as a threshold test, while the modern *Graver Tank* type doctrine does not require literal infringement at all. Therefore, the Court's adoption of the theory that the historical doctrine of equivalents was codified in 35 U.S.C. § 112, P6 does not interfere with the Court's holding in *Warner-Jenkinson* that the *Graver Tank* type doctrine of equivalents is not outlawed by the equivalents clause.

The Supreme Court's view in *Warner-Jenkinson* and the historical approach to the equivalents clause mutually reinforce one another, because they are one in the same. First, the historical reading of 35 U.S.C. § 112, P6 has gained additional support from the Supreme Court's statement. Second, the fact that *Warner-Jenkinson* conforms with the

[*176] historical approach to the equivalents clause makes the Supreme Court's view *prima facie* superior to the Federal Circuit's contrary approach. The only remaining questions are why the Federal Circuit did not follow the same straightforward approach, and whether the results produced by the Federal Circuit's approach justify the use of a different theory so as to rebut the Supreme Court's *prima facie* case of superiority.

III. THE EQUIVALENTS CLAUSE IN THE FEDERAL CIRCUIT

A. The Federal Circuit's Departure from Controlling Precedent

In view of the case law of the Federal Circuit's predecessor courts, the Federal Circuit's adoption of any theory other than the Supreme Court's theory appeared to be unlikely. In its first decision, the Federal Circuit adopted the case law of its predecessor courts as precedent. n53 One of these predecessor courts was the Court of Customs and Patent Appeals ("CCPA"). In *In re Lundberg*, n54 the CCPA held that 35 U.S.C. § 112, P6 has no bearing on patentability determinations by the Patent and Trademark Office ("PTO"). n55 The ruling supports the theory underlying the Supreme Court's view that the equivalents clause governs the scope of the claim, but not its meaning. It was also reflected in the PTO's practice of rejecting functional claims based on prior art that disclosed *any* means for performing the defined function, regardless of whether it was the means disclosed in the specification or an equivalent thereof. n56 Only if the equivalents clause does not govern the meaning of the claim

[*177] does the PTO then not have to consider it in determining the claim's patentability. Therefore, even if the CCPA did not squarely hold that the equivalents clause is a codification of the doctrine of equivalents as applied to means-plus-function claims, its ruling at least facilitates such a conclusion, because it is consistent with the codification theory. Certainly, it does not support the opposite theory entertained by the Federal Circuit today. Indeed, the Federal Circuit's departure from CCPA precedent, in line with the historical approach to the equivalents clause, was not an abrupt one. The change developed in the context of infringement and was triggered by an ultimately productive misunderstanding n57 of the term "literal infringement."

B. Literal Infringement: A Productive Misunderstanding

1. The Equivalents Clause in the Context of Infringement

One of the first challenges for the Federal Circuit was to clarify the role of the equivalents clause in the context of infringement. The standard infringement test applied by the Federal Circuit consists of two steps. n58 First, the patent claims must be interpreted in order to determine their meaning. n59 Second, the properly interpreted claims have to be compared to the accused device or process. n60 If the accused subject matter comes within the meaning of the patent claims, the claims are said to read on the accused device or process, and "literal" infringement is made out. n61 However, under the doctrine of equivalents, a product or process that does not literally infringe "the express terms of a patent claim may nonetheless be found to infringe if there is 'equivalence' between the elements of the accused product or process and the claimed

[*178] elements of the patented invention." n62 This standard infringement analysis applies to all types of claims, regardless of the claim format.

Whenever the infringement of means-plus-function claims is at issue, however, the courts have to consider the equivalents clause, which requires such claims to be construed to cover the corresponding structure described in the specification and equivalents thereof. In merging the established two-step infringement analysis with the equivalents clause, the Federal Circuit had two options. The first option was to incorporate the equivalents clause into the first step, claim interpretation, and read the clause as governing the *meaning* of the means-plus-function claim, which essentially takes care of the issue of literal infringement. The second option was to interpret the equivalents clause as part of the second step, namely as a recognition of the doctrine of equivalents, which determines the ultimate *scope* of the means-plus-function claim. Since the infringement test is always a two-step analysis, regardless of whether the equivalents clause is part of the first or the second step, the outcome of the overall analysis will be the same. Perhaps, that is the reason why the Federal Circuit was not very precise when employing the term "literal infringement." However, the paramount significance of the meaning of a claim in areas other than infringement turns this imprecision into a key factor for the Federal Circuit's departure from the traditional approach to the equivalents clause.

2. From Claim Scope to Claim Meaning: The Significance of Non-Equivalent Means

In *D.M.I., Inc. v. Deere & Co.*, n63 the Federal Circuit reversed and remanded the district court's grant of summary judgment of non-infringement, because the district court impermissibly limited the means-plus-function claim to the structure disclosed in the specification, thereby disregarding 35 U.S.C. § 112, P6. n64 Responding to the district court's concern that D.M.I.'s claim of equivalence was too expansive, the Federal Circuit made it clear that equivalents under 35 U.S.C. § 112, P6 do not broaden the scope of the claim beyond literal infringement, unlike the doctrine of equivalents. n65 The Federal Circuit specifically used the term "literal infringement" to distinguish the equivalents clause from the

[*179] doctrine of equivalents. n66 Such a distinction was proper in that today, the doctrine of equivalents is applied on an element-by-element basis, n67 while at the time of *D.M.I.*, it was applied to the invention as a whole. n68 However, the Federal Circuit did not indicate that non-equivalent means, performing the function recited in the means-plus-function claim, would escape a charge of literal infringement. n69 It follows that the *D.M.I.* court did not consider the equivalents clause as governing the meaning of the means-plus-function claim, but rather as governing the scope of the claim. n70 This result is supported by the court's statement that the question of equivalence under 35 U.S.C. § 112, P6 is a question of fact. n71 *D.M.I.* was confirmed two months later in *Palumbo v. Don-Joy Co.* n72

The term "literal infringement," however, was later misunderstood as excluding non-equivalent means. In *King Instrument Corp. v. Otari Corp.*, n73 the court stated that, "once the accused device is *found to be an equivalent* under § 112, then *literal infringement* has properly been established," n74 thereby indicating that the equivalents clause would govern the meaning of the claim instead of its scope. Only two years later, the shift from claim scope to claim meaning was made in *Data Line Corp. v. Micro Technologies, Inc.* n75 and *Pennwalt Corp. v. Durland Wayland, Inc.* n76 In *Data Line*, the Federal Circuit understood the equivalents clause as excluding "some means which perform the specified function from *literally* satisfying the claim limitation." n77 In *Pennwalt*, the court stated

[*180] that the equivalents clause "rules out the possibility that any and every means which performs the function specified in the claim *literally* satisfies that limitation." n78

The court's misunderstanding of the term "literal infringement" as used in prior decisions ultimately proved to be productive in that it shifted the Federal Circuit's approach to the equivalents clause. However, as explained above, this shift did not have any practical consequences in the context of infringement, because the overall infringement test remained the same. The infringement test still asked whether the accused structure performs the same function as recited in the means-plus-function clause and whether the structure used is the same as or the equivalent of the corresponding structure described in the specification. n79 Accordingly, only equivalent means of the structure recited in the written description can infringe the means-plus-function claim, regardless of whether non-equivalent means are filtered out as not being within the scope or as not being within the meaning of the claim. However, the impact of this change was significant in the context of patentability and validity, where the scope of the claim does not matter and only the meaning of the claim governs.

3. Impact on Validity and Patentability Determinations

The most important effects of the Federal Circuit's change in its approach to the equivalents clause, as triggered in the context of infringement by the misunderstanding of the term "literal infringement," lay outside the context of infringement. First, it legitimized the Federal

[*181] Circuit's application of 35 U.S.C. § 112, P6 to validity determinations. n80 Second, it provided a consistent theoretical framework for the application of the equivalents clause to patentability determinations during prosecution. Indeed, if the equivalents clause governs the *meaning* of means-plus-function claims, as opposed to their *scope*, 35 U.S.C. § 112, P6 must also be applied to validity and patentability determinations, because the meaning of a claim must be the same for infringement, patentability, and validity. n81 On this theoretical basis, the Federal Circuit could safely overturn the CCPA's *Lundberg* decision. However, the court did not do so immediately. The court first touched on the issue in two concurring opinions in *In re Queener* n82 and in a footnote in *In re Iwahashi*, n83 before it accomplished the change substantively in *In re Bond*. n84 When the PTO refused to follow the Federal Circuit's new reading of the equivalents clause n85 (probably because the three-judge panel in *Bond* could not validly overrule *Lundberg*), n86 the Federal Circuit used its power as an appellate court to accomplish the formal shift when sitting en banc in *In re Donaldson Co.* n87 The court explicitly overruled *Lundberg*. n88 More importantly, however, it did so by invoking the theory it had developed in the "literal infringement" cases recited above, strictly disregarding the distinction between meaning and scope of a

[*182] means-plus-function claim, as called for by a proper interpretation of 35 U.S.C. § 112, P6. For instance, when faced with the argument that the application of the equivalents clause during prosecution would conflict with the rule that limitations should not be read from the specification into the claims, n89 the Federal Circuit explained that the equivalents clause only referred "to the specification to determine the *meaning* of a particular word or phrase recited in a claim." n90 The adoption of this theory turned the equivalents clause into a simple claim interpretation rule.

4. The Equivalents Clause as a Claim Interpretation Rule

The tenor of the Federal Circuit's approach to 35 U.S.C. § 112, P6 is that the equivalents clause governs the meaning of a means-plus-function claim, as opposed to its scope. What had started out in the context of infringement was carried over to validity and patentability. The circle was closed when an infringement case quoted *Donaldson* for the interpretation of a means-plus-function claim. n91 Consequently, the equivalents clause now applies regardless of the context in which the interpretation of means-plus-function language arises. Unfortunately, the court's approach does not account for the doctrine of equivalents, which applies to the claims *as interpreted*. The Federal Circuit's failure to eliminate inconsistencies arising out of the application of its new theory is the main indicator for the inferiority of its approach as compared to the Supreme Court's view. Furthermore, the court has, as yet, been unable to provide guidelines as to how to implement this concept in practice, thus creating one of the major sources of uncertainty in patent infringement litigation.

[*183] C. *Unnecessary Conflicts: Equivalents of Equivalents*

1. Equivalents Clause and the Doctrine of Equivalents

The most troubling consequence of the Federal Circuit's reading of the equivalents clause is that it creates a conflict between two sets of equivalents. If equivalents are considered during claim interpretation, when the meaning and the literal reach of the means-plus-function claim are determined, what is the role of the doctrine of equivalents? Under the standard infringement test, the means-plus-function claim, as interpreted in light of *35 U.S.C. § 112*, P6, is subject to the doctrine of equivalents, which ultimately leads to a meaningless "equivalents of equivalents" test.

In addition to the substantive problems it creates, the Federal Circuit's approach yields serious procedural complications. On one hand, claim interpretation in general is a question of law n92 open to *de novo* review on appeal. n93 On the other hand, determination of equivalence is considered a question of fact for the jury and is subject to a more deferential standard of review, at least as far as the doctrine of equivalents is concerned. n94 Of course, characterizing the equivalence inquiry under *35 U.S.C. § 112*, P6 as part of claim interpretation poses a serious problem as to which category this inquiry belongs. While some early Federal Circuit cases held that equivalents determinations under *35 U.S.C. § 112*, P6 are factual inquiries, n95 other cases have held to the contrary. n96 The issue is still open to debate because both the Federal Circuit and the Supreme Court have refused to rule on it. n97 Deciding the issue either way

[*184] would be inconsistent within the framework of the Federal Circuit's theory.

These paradoxical results alone raise a red flag which should make the Federal Circuit reconsider its interpretation of *35 U.S.C. § 112*, P6. Nevertheless, the Federal Circuit continues to see two sets of equivalents where there is only one. To justify its view, the Federal Circuit has made considerable efforts to distinguish the equivalents clause and the doctrine of equivalents from each other in the area of functional claiming. n98 Unfortunately, those efforts have failed, and inconsistencies persist.

2. The Federal Circuit's Search for Meaningful Distinctions

a) Nature of the Equivalence Inquiries

The first attempt to find distinctions between the two sets of equivalents was based on the proposition that *35 U.S.C. § 112*, P6 applies to single elements in a combination invention, while the doctrine of equivalents applies to the invention as a whole. n99 This difference was probably one of the reasons why the equivalents clause became a claim interpretation tool in the first place. However, such a distinction could no longer be upheld after the Federal Circuit changed to an element-by-element approach for the doctrine of equivalents, n100 an approach which the Supreme Court recently endorsed. n101 In other words, the original distinction between the equivalents clause and the doctrine of equivalents no longer exists. The fundamental change in the nature of the doctrine of equivalents would certainly provide a valid argument to back up a reconsideration of the Federal Circuit's approach to the equivalents clause. Instead, the Federal Circuit continues its search for further distinctions.

[*185] Even after the historical distinction was no longer available, the court tried to introduce the same distinction couched under different terms. In one case, the court justified its distinction on the grounds that 35 U.S.C. § 112, P6 applies the common principle of "insubstantial change" to the *structure* disclosed in the specification, while the doctrine of equivalents applies the same principle to the claimed *invention*. n102 Here, ironically, the Federal Circuit sacrifices the very premise on which its approach relies. If "structure plus equivalents" is what the claim *means*, as the court pretends, then the structure becomes part of the claim itself, and an insubstantial change of the structure is at the same time an insubstantial change of the claimed invention. Hence, there is no difference between the two.

A third proposal to distinguish the two concepts of equivalence was also based on the "nature" of the respective equivalence inquiries. While the equivalents clause was viewed as a statutory test, which had to be applied as a matter of law whenever means-plus-function claims were involved, some cases considered the doctrine of equivalents to be equitable in nature. n103 However, as with the first distinction, the Federal Circuit, sitting en banc in *Hilton Davis Chemical Co. v. Warner-Jenkinson Co.*, n104 put an end to that view of the doctrine of equivalents, when it held that the doctrine of equivalents is for the jury to decide. n105 Today, the doctrine of equivalents is simply the second prong of every infringement charge, void of equitable considerations. Therefore, it does not differ from the statutorily mandated equivalents inquiry under 35 U.S.C. § 112, P6, which is also not subject to judicial discretion.

[*186] b) Identical and Equivalent Functions

A distinction which seems more consistent with the Federal Circuit's position is that 35 U.S.C. § 112, P6 requires "identical" functions, while the doctrine requires merely "equivalent" functions. n106 However, when the Federal Circuit was squarely faced with "equivalent functions" in *Mas-Hamilton Group v. LaGard, Inc.*, n107 the court essentially applied the same equivalence test twice. First, the Federal Circuit applied a 35 U.S.C. § 112, P6 equivalence test without indicating what standard it used, and when it found no structural equivalence between the described structure (a solenoid) and the accused structure (a stepper motor), it simply performed a second equivalence test under the doctrine, applying the well-known function-way-result test. n108 Not surprisingly, the court also did not find infringement under the doctrine of equivalents. More importantly, under both tests, the Federal Circuit compared the two structures, not two functions.

In the recent case of *WMS Gaming Inc. v. International Game Technology*, n109 the court dealt with the alleged infringement of a patent relating to a virtual reel slot machine, i.e. a slot machine that decreases the probability of winning while maintaining the external appearance of a standard mechanical slot machine. n110 After interpreting the means-plus-function limitations of the claim at issue, the Federal Circuit reversed the district court's holding of literal infringement under the equivalents clause, due to lack of *identical* functions: the accused device assigned and selected combinations of numbers rather than single numbers as required by the properly interpreted claim. n111 The court then stated that the accused device could still infringe under the doctrine of equivalents based on a theory of *equivalent* functions. n112 However, instead of addressing the issue of equivalent functions, the court simply concluded that "the accused device . . . assigns numbers to stop positions as required by [the

[*187] claim at issue]" and affirmed the district court's finding of infringement under the doctrine of equivalents. n113 If the accused device performs the function recited in the claim, however, the functions are not merely equivalent, but identical. Despite its stated intention to do so, the Federal Circuit yet again avoided an inquiry into functional equivalence.

As these two cases reveal, the distinction between identical and equivalent functions may appear promising in theory, but it is empty in practice. Rather than comparing two abstract functions, a meaningful equivalence test must always compare tangible structures, whether they be in the claims (doctrine of equivalents) or in the specification (equivalents clause). n114 However, purely functional claims are, by definition, void of structure, so the application of the doctrine of equivalents to functions recited in such claims is meaningless. n115 The only relevant concept of equivalence is the equivalents clause, which applies to the structure disclosed in the specification.

c) Standards for Equivalence Determinations

The proposition that there is no difference between equivalents under 35 U.S.C. § 112, P6 and under the doctrine of equivalents is further supported by the Federal Circuit's use of the same factors to determine infringement. In *Texas Instruments, Inc. v. United States International Trade Commission*, n116 the court explained that, "as an aid in determining the breadth of equivalents to be afforded means plus function clauses under section 112, the prosecution history, the other claims in the patent, expert testimony, and the language of the asserted claims may be considered in addition to the specification." n117 The Federal Circuit even applied the same test for *both* equivalence determinations. n118 According

[*188] to the court in *Palumbo v. Don-Joy Co.*, n119 "although . . . there is a difference between a doctrine-of-equivalents analysis and a literal infringement analysis involving 'equivalents' under § 112, the *Graver Tank* concepts of equivalents are relevant in any 'equivalents' determination." n120 The statements by these courts are even more remarkable if one considers that, at that time, the very same courts could still distinguish the equivalents clause from the doctrine of equivalents on the grounds that the latter applied to the invention as a whole. After the change to an element-by-element analysis, those statements became even more compelling support for finding that the standards are the same. Indeed, the Federal Circuit today applies an insubstantial difference test to determine equivalence, both under the equivalents clause and under the doctrine of equivalents. n121

Even when an opinion explicitly states that there are two different concepts of equivalence, one under *35 U.S.C. § 112*, P6 and the other under the doctrine, the court still tries to avoid a conflict between the two by applying only one equivalence test. In some cases, the court has simply discarded the doctrine of equivalents by stating that there is not enough evidence to support a finding of infringement under the doctrine, once it has applied *35 U.S.C. § 112*, P6. n122 In contrast, the court has also limited the means-plus-function claim to the structure disclosed in the specification without extending it to equivalents under *35 U.S.C. § 112*, P6, but then performed an equivalence test under the doctrine. n123 In sum, the equivalence standard applied by the Federal Circuit does not distinguish *35 U.S.C. § 112*, P6 from the doctrine of equivalents. n124

[*189] d) Differences Created by the Federal Circuit's Own Approach

The Federal Circuit's most advanced analysis of the paradoxical "equivalents of equivalents" can be found in *Chiuminatta Concrete Concepts, Inc. v. Cardinal Industries, Inc.* n125 In *Chiuminatta*, the court recognized that two structures cannot be simultaneously "not equivalent" and "equivalent." n126 Therefore, "a finding of a lack of literal infringement for lack of equivalent structure under a means-plus-function limitation may preclude a finding of equivalence under the doctrine of equivalents." n127 This is nothing other than an admission that there is only one test and one set of equivalents, not two. However, the court discerns one exception regarding the *time* of determining equivalence. The analysis under 35 U.S.C. § 112, P6 is, as a matter of claim interpretation, limited to equivalents at the date of the patent. n128 Therefore, an equivalent of the structure disclosed in the specification that is developed after the date of the patent avoids a charge of literal infringement despite the fact that the functional claim reads on the equivalent. The desire to cover this after-developed technology calls for the application of the doctrine of equivalents, which determines equivalence at the time of infringement. n129 Indeed, under the Federal Circuit's current reading of 35 U.S.C. § 112, P6, this time difference is the only material feature which distinguishes the equivalents clause from the doctrine of equivalents. However, the Federal Circuit overlooks that both the time problem and the need for an additional equivalence concept represented by the doctrine are artificially created by the court's choice to read 35 U.S.C. § 112, P6 as part of the claim interpretation step. n130

[*190] D. *The Federal Circuit's Approach Revisited*

Overall, the Federal Circuit has failed to define the differences between the equivalents clause and the doctrine of equivalents, other than those which are a product of the court's own deliberate creation. While given the ample opportunity to elaborate on the issue, the court's inability to find meaningful distinctions reveals the weakness of the Federal Circuit's theory underlying its approach to the equivalents clause of *35 U.S.C. § 112, P6*. Interestingly, the Federal Circuit, probably inadvertently, got it right when it explained that,

in place of the *Halliburton* rule, Congress adopted a compromise solution, one that had support in the pre-*Halliburton* case law: Congress permitted the use of purely functional language in claims, but it limited the breadth of such claim language by restricting its *scope* to the structure disclosed in the specification and equivalents thereof. n131

1. Superiority of the Supreme Court's Approach

The historical approach endorsed by the Supreme Court would readily, easily, and consistently solve all the Federal Circuit's problems with the concept of equivalence in one strike. Because the equivalents clause would only be relevant to determine the scope of the means-plus-function claim in the context of infringement, the doctrine of equivalents and *35 U.S.C. § 112, P6* would merge into one single equivalence inquiry. The Federal Circuit could refrain from wasting time on its search for a meaningful, but nonexistent, distinction between the two concepts of equivalence. The substantive "equivalents of equivalents" problems would be moot, and procedural tensions would be eliminated. The interpretation of the words in means-plus-function claims would still be a matter of law for the trial judge to decide, subject to a *de novo* review on appeal, while the determination of equivalents would be a matter of fact for the jury, subject to appellate review for substantial evidentiary support. Furthermore, there would no longer be any *Chiuminatta* time differences between the equivalents clause and the doctrine of equivalents. If the equivalents clause governs the scope instead of the meaning of the claim, it is no longer tied to the date of the patent. Instead, equivalence can be determined at the date of infringement. The overall infringement test for means-plus-function claims would be limited to the application of *35 U.S.C. § 112, P6*, and no further equivalence inquiry would have to be

[*191] performed. Finally, the historical Supreme Court approach acknowledges that what is claimed in a means-plus-function claim is not a function, but a means, which is a structure, and the doctrine of equivalents would not have to be applied to functions.

2. Side Benefits under the Historical Approach

a) Removing Support for the Modern Doctrine of Equivalents

The historical reading of 35 U.S.C. § 112, P6 would also have three side benefits. The first benefit is that it would contribute to the demise of the *Graver Tank* type doctrine of equivalents in general. The flaws of this doctrine are evident. Justice Black's dissent in *Graver Tank* pointed them all out. First, if the doctrine of equivalents is applied to claims, the claims no longer define the invention. n132 Second, the *Miller* rule is no longer applicable, because the doctrine of equivalents enables the patentee to recapture what was described in the specification, but not claimed. n133 Third, this approach undermines the reissue statute, because the patentee is allowed to correct claims after issuance, which can only be done by reissue. n134 Fourth, this approach conflicts with the examination system, because the PTO no longer defines the maximum scope of the claims, which is what the examination system is all about. n135 One may add that the public notice function of claims is diminished, n136 because nobody can reasonably assess what the court will regard as the invention in an infringement suit.

Currently, the *Chiuminatta* time difference is one of the main arguments in favor of the *Graver Tank* type doctrine of equivalents. n137 Under the historical approach, however, this time difference would fall,

[*192] and with it would go an important argument in support of the doctrine of equivalents. The doctrine would no longer be necessary to cover after-rising technology that escapes coverage under 35 U.S.C. § 112, P6. As a result, the doctrine of equivalents could be reduced to a purely equitable doctrine, n138 which would not have to be applied as a standard second prong in every single infringement analysis, but which instead could be reserved for those rare circumstances in which justice requires a correction of the claim in suit in order to find or avoid infringement.

b) Narrow Claims for Narrow Inventions

The second benefit is a result of the inapplicability of the equivalents clause to validity and patentability determinations. The Federal Circuit's current approach to 35 U.S.C. § 112, P6 results in the issuance of claims that may read on the prior art, if read as written. Whenever the inventive concept lies merely in the specific way the function is carried out rather than in the use of an element that performs a particular function, a means-plus-function claim is too broad. Prior to *Donaldson*, an applicant had to narrow the claim whenever there was a structure in the prior art that performed the defined function, even if it was not an equivalent of the structure disclosed in the specification. Since the *Donaldson* decision, such claims no longer need to be narrowed, because 35 U.S.C. § 112, P6 allows claims to be narrowed by way of interpretation to overcome prior art rejections. Simply put, an inventor of a structure can claim a structure in means-plus-function format, thereby obtaining the benefit of incorporating equivalents into the claim, rather than relying on the doctrine of equivalents to enlarge the scope of protection for the invention. n139 However, there is no sound reason why a claim should issue that does not patentably define over the prior art, n140 just because it is drafted in means-plus-function language. n141 The only appropriate way to narrow overly broad claims is either by amendment

[*193] during prosecution or by reissue or reexamination after issuance. n142 Claim interpretation in the PTO should not be used to circumvent vital provisions in the Patent Act, since the Act's purpose is to provide notice to the public to allow third parties to avoid infringement. The historical approach also safeguards against such circumvention, because the equivalents clause would not apply during prosecution.

c) Towards International Harmonization of Claim Drafting Practices

The third benefit is that the historical approach would avoid a disharmony with claim drafting practice in Europe and Asia. The use of means-plus-function claims to incorporate equivalents, yet avoid distinct pieces of prior art which perform the function recited in the claim but are not equivalent to the structure disclosed in the specification, is unique to the United States. There are no similar provisions abroad that would allow limitation of a means-plus-function claim to the disclosed structure and its equivalents for purposes of validity. In other words, the claim that might be valid in the United States due to a narrowing claim interpretation pursuant to *35 U.S.C. § 112, P6* may well be invalid abroad where such a narrowing interpretation is not available and where the claims are read as written. This is not only a disharmony, but it is also a risk for U.S. inventors who try to protect their inventions abroad, if they employ means-plus-function claims in the U.S. application and then attempt to use the same claim language in parallel foreign applications. Prior to *Donaldson* and under the historical approach, this was not so much of a problem, because claims were not, or at least should not have been, narrowed for purposes of patentability, and the most "risky" claims would not have issued in the United States.

IV. CONCLUSION: A CALL FOR CONGRESSIONAL INTERVENTION

The Federal Circuit's current understanding of the equivalents clause of *35 U.S.C. § 112, P6* yields unsound results. It 1) allows for claims to issue which do not patentably define over the prior art if read as written; 2) increases the disharmony with international claim drafting practice, ultimately to the detriment of U.S. inventors; 3) leaves patentees and the public in the dark in terms of how infringement of means-plus-function claims is determined under the doctrine of equivalents;

[*194] and 4) creates considerable procedural problems on the trial and appellate levels.

These problems could have been avoided if the Federal Circuit had adopted the proper interpretation of 35 U.S.C. § 112, P6. The proper interpretation is that 35 U.S.C. § 112, P6 codifies the historical infringement law for means-plus-function claims, and that the equivalents clause is a provision that governs the scope and not the meaning of such claims. Consequently, the meaning of the means-plus-function claim is that it encompasses "any" means to perform the specified function, and it is this meaning that is relevant for patentability, validity, and even as a threshold value for infringement. The ultimate inquiry for infringement, however, is based on a test of structural equivalence, which determines the scope of the claim. This interpretation is supported by the history of infringement law and the statutory wording of 35 U.S.C. § 112, P6 and was endorsed by the Supreme Court in *Warner-Jenkinson*. If the Federal Circuit adopted the proper interpretation, it would no longer have to worry about "equivalents of equivalents" and their procedural implications.

Regrettably, it is unlikely that the Federal Circuit will change its approach, particularly in view of its recent en banc decision in *Donaldson*, which it has since confirmed several times. The Supreme Court strongly defers to the Federal Circuit in the area of patent law. Therefore, it is unlikely that the Supreme Court will step in to remedy the Federal Circuit's inconsistencies, despite the fact that these inconsistencies would not exist if the Federal Circuit took the Supreme Court's statement in *Warner-Jenkinson* seriously. Ironically, although Congress enacted 35 U.S.C. § 112, P6 in 1952 with the intent of bringing certainty and flexibility to the law of means-plus-function claims, the only way it can now bring about the certainty and flexibility it originally sought is by completely eliminating the provision. It is unfortunate that case law has turned a useful, balanced, and long-standing statutory infringement test into a burden for the patent system. This calls for congressional intervention. In light of the move towards international harmonization, it may be best to simply strike 35 U.S.C. § 112, P6 altogether and close a rather dark chapter in the Federal Circuit's history.

n1 520 U.S. 17, 41 U.S.P.Q.2d (BNA) 1865 (1997).

n2 35 U.S.C. § 112, P6 (1994).

n3 *Warner-Jenkinson*, 520 U.S. at 28, 41 U.S.P.Q.2d at 1870.

n4 16 F.3d 1189, 29 U.S.P.Q.2d (BNA) 1845 (Fed. Cir. 1994) (en banc).

n5 *See id.* at 1194, 29 U.S.P.Q.2d at 1849.

n6 *Id.*

n7 *See* 35 U.S.C. §§ 101, 111(a)(2)(A), 112, P1 & 2 (1994).

n8 H.R. REP. NO. 82-1923 (1952).

n9 S. REP. NO. 82-1979 (1952), *reprinted in* 1952 U.S.C.C.A.N. 2394.

n10 *See Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 27, 41 U.S.P.Q.2d (BNA) 1865, 1870 (1997); *In re Donaldson*, 16 F.3d at 1194, 29 U.S.P.Q. at

1849 (*Fed. Cir.* 1994); *In re Fuetterer*, 319 F.2d 259, 264 n.11, U.S.P.Q. 217, 222 n.11 (C.C.P.A. 1963).

n11 329 U.S. 1, 71 U.S.P.Q. (BNA) 175 (1946).

n12 *Id.* at 8, 71 U.S.P.Q. at 178.

n13 Note that today's 35 U.S.C. § 112, P6 was originally enacted as § 112, P3 and thus followed right behind 35 U.S.C. § 112, P1 & 2, the provisions whose predecessors *Halliburton* used to invalidate the functional claims in suit.

n14 *See In re Swinehart*, 439 F.2d 210, 213, 169 U.S.P.Q. (BNA) 226, 229 (C.C.P.A. 1971).

n15 35 U.S.C. § 112, P6 (1994).

n16 *See* 35 U.S.C. § 112, P6 (1994).

n17 *See* Patent Act of 1790, ch. 7, § 4, 1 Stat. 109, 111 (1790); Patent Act of 1793, ch. 11, § 5, 1 Stat. 318, 322 (1793); Patent Act of 1836, ch. 357, § 14, 5 Stat. 117, 123 (1836); Patent Act of 1870, ch. 230, § 55, 16 Stat. 198, 206 (1870).

n18 35 U.S.C. § 271(a) (1994 & Supp. IV 1998).

n19 *See* Patent Act of 1790, ch. 7, § 2, 1 Stat. 109, 110 (1790); Patent Act of 1793, ch. 11, § 3, 1 Stat. 318, 321 (1793); Patent Act of 1836, ch. 357, § 6, 5 Stat. 117, 119 (1836); Patent Act of 1870, ch. 230, § 26, 16 Stat. 198, 201 (1870); 35 U.S.C. § 112, P2 (1994).

n20 *See* U.S. CONST. art. 1, § 8, cl. 8 ("The Congress shall have power . . . To promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries.").

n21 *See, e.g., Odiorne v. Winkley*, 18 F. Cas. 581, 582 (C.C.D. Mass. 1814) (No. 10,432) (charging the jury with the question of whether "the machines used by the defendant are substantially, in their principles and mode of operation, like the plaintiff's machines"); *see also Gray v. James*, 10 F. Cas. 1015, 1016 (C.C.D. Pa. 1817) (No. 5,718); *Park v. Little*, 18 F. Cas. 1107 (C.C.D. Pa. 1813) (No. 10,715); *Reutgen v. Kanowrs*, 20 F. Cas. 555, 556 (C.C.D. Pa. 1804) (No. 11,710).

n22 The expression was first used in *McCormick v. Talcott*, 61 U.S. 402, 405 (1857).

n23 Originally, the specification merely specified the inventor's claim and was thus coextensive with the claim. Accordingly, in *Winans v. Denmead*, 56 U.S. 330, 338 (1853), the Supreme Court used the expression "specification of claim" (emphasis added), which indicates that the specification as a whole performed both a descriptive and a definitional function. In *Merrill v. Yeomans*, 94 U.S. 568, 570 (1876) and *Burns v. Meyer*, 100 U.S. 671, 671 (1879), however, the definitional function of the claim was already considered of primary importance.

n24 Note that the Patent Act of 1870 required the inventor for the first time to "particularly point out and *distinctly* claim" his invention. Patent Act of 1870, ch. 230, § 26, 16 Stat. 198, 201 (1870) (emphasis added). Interestingly, the statute used the words "specification *and* claim," Patent Act of 1870, ch. 230, § 55, 16 Stat. 198, 206 (1870)

(emphasis added), as opposed to "specification of claim," thus indicating the functional separation within the specification.

n25 See *Miller v. Bridgeport Brass Co.*, 104 U.S. 350, 352 (1881) ("It must be remembered that the claim of a specific device or combination, and an omission to claim other devices or combinations apparent on the face of the patent, are, in law, a dedication to the public of that which is not claimed. It is a declaration that that which is not claimed is either not the patentee's invention, or, if his, he dedicates it to the public."); *Mahn v. Hardwood*, 12 U.S. 354, 361 (1884) ("Of course, what is not claimed is public property."); see also *Maxwell v. J. Baker, Inc.*, 86 F.3d 1098, 1106-07, 39 U.S.P.Q.2d (BNA) 1001, 1006 (Fed. Cir. 1996).

n26 210 U.S. 405 (1908).

n27 See also *Westinghouse v. Boyden Power Brake Co.*, 170 U.S. 537 (1898). For an exhaustive list of cases reflecting the historical infringement test, see Ronald D. Hantman, *Doctrine of Equivalents*, 70 J. PAT. & TRADEMARK OFF. SOC'Y 511, 531 n.90 (1988).

n28 *Continental Paper Bag*, 210 U.S. at 406.

n29 *Id.* at 417 (citing U.S. Patent No. 558,969 issued to Liddell (Feb. 6, 1896)).

n30 See *id.* at 415-16

n31 *Id.* at 416.

n32 *Id.* at 420-21.

n33 See *id.* at 422.

n34 See *id.* at 421-22.

n35 See *id.* at 421.

n36 See *id.*

n37 *Id.*

n38 *Id.*

n39 See *id.* at 420-22.

n40 See *id.* at 422.

n41 See, e.g., *Valmont Indus., Inc. v. Reinke Mfg. Co.*, 983 F.2d 1039, 1042, 25 U.S.P.Q.2d (BNA) 1451, 1454 (Fed. Cir. 1993); *Johnston v. IVAC Corp.*, 885 F.2d 1574, 1580, 12 U.S.P.Q.2d (BNA) 1382, 1386 (Fed. Cir. 1989) ("Properly understood section 112 P6 operates more like the reverse doctrine of equivalents than the doctrine of equivalents because it restricts the scope of the literal claim language.").

n42 339 U.S. 605, 85 U.S.P.Q. (BNA) 328 (1950).

n43 See, e.g., *Del Mar Avionics, Inc. v. Quinton Instrument Co.*, 836 F.2d 1320, 1325, 5 U.S.P.Q.2d (BNA) 1255, 1259 (Fed. Cir. 1987); *Rolls-Royce Ltd. v. GTE Valeron Corp.*, 800 F.2d 1101, 1108, 231 U.S.P.Q. (BNA) 185, 190 (Fed. Cir. 1986); *SRI Int'l v. Matsushita Elec. Corp. of Am.*, 775 F.2d 1107, 227 U.S.P.Q. (BNA) 577, 587 (Fed. Cir.

1985) (en banc); *Martin v. Barber*, 755 F.2d 1564, 1567 n.1, 225 U.S.P.Q. (BNA) 233, 236 n.1 (Fed. Cir. 1985) *Studiengesellschaft Kohle, m.b.H. v. Dart Indus., Inc.*, 726 F.2d 724, 728, 220 U.S.P.Q. (BNA) 841, 843 (Fed. Cir. 1984).

n44 See, e.g., *Winans v. Denmead*, 56 U.S. 330 (1853).

n45 *Texas Instruments, Inc. v. United States Int'l Trade Comm'n.*, 846 F.2d 1369, 1371, 6 U.S.P.Q.2d (BNA) 1886, 1889 (Fed. Cir. 1988).

n46 See *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 40, 41 U.S.P.Q.2d (BNA) 1865, 1875 (1997) (the decisive patent infringement inquiry is whether "the accused product or process contain[s] elements *identical or equivalent* to each claimed element of the patented invention" (emphasis added)).

n47 Compare *Continental Paper Bag Co. v. Eastern Paper Bag Co.*, 210 U.S. 405 (1908) (historical infringement test), with 35 U.S.C. § 112, P6, cl. 2 (1994) (equivalents clause).

n48 See, e.g., *Holland Co. v. American Steel Foundries*, 101 F. Supp. 388, 390, 92 U.S.P.Q. (BNA) 204, 206 (N.D. Ill. 1951) ("equivalents"); *Van Der Horst Corp. of Am. v. Chromium Corp. of Am.*, 98 F. Supp. 412, 416, 90 U.S.P.Q. (BNA) 169, 173, (S.D.N.Y. 1951) ("equivalents"); *Alamo Refining Co. v. Shell Dev. Co.*, 99 F. Supp. 790, 798, 90 U.S.P.Q. (BNA) 326, 332 (D. Del. 1951) ("to cover"); *Barclay & Co. v. Necchi Sewing Mach. Sales Corp.*, 101 F. Supp. 515, 520, 91 U.S.P.Q. (BNA) 370, 375 (4th Cir. 1951) ("construction"); *E.I.M. Co. v. Philadelphia Gear Works*, 102 F. Supp. 14, 21, 25, 92 U.S.P.Q. (BNA) 420, 425, 428 (S.D. Tex. 1951) ("to cover" and "construction" respectively).

n49 See, e.g., *Continental Paper Bag Co. v. Eastern Paper Bag Co.*, 210 U.S. 405 (1908).

n50 See 3 MARTIN J. ADELMAN, PATENT LAW PERSPECTIVES, § 2.9[5], at 2-1176.4 (rel. no. 57, July 1994).

n51 See, for example, the late Judge Nies' accurate comment on the use of key terms in early Supreme Court decisions regarding the doctrine of equivalents in *Warner-Jenkinson Co. v. Hilton Davis Chemical Co.*, 62 F.3d 1512, 1569, 35 U.S.P.Q.2d (BNA) 1641, 1688 (Fed. Cir. 1995) (en banc), *rev'd*, 520 U.S. 17, 41 U.S.P.Q.2d (BNA) 1865 (1997) (Nies, J., dissenting). Judge Nies stated:

My reading of the Supreme Court's decisions of the era leads me to conclude that the Court generally used the word 'interpret' when it was speaking of the meaning of the words and 'construe' in connection with determining protection beyond the words, that is, the 'scope' of protection for the claim, as in contract law.

Id.

n52 *Warner-Jenkinson*, 520 U.S. at 28, 41 U.S.P.Q.2d at 1876 (citation omitted).

n53 See *South Corp. v. United States*, 690 F.2d 1368, 1370, 215 U.S.P.Q. (BNA) 657, 657-58 (Fed. Cir. 1982) ("As a foundation for decision in this and subsequent cases in this court, we deem it fitting, necessary, and proper to adopt an established body of law as precedent. That body of law represented by the holdings of the Court of Claims and

the Court of Customs and Patent Appeals announced before the close of business on September 30, 1982 is . . . herewith adopted by this court sitting in banc.").

n54 244 F.2d 543, 113 U.S.P.Q. (BNA) 530 (C.C.P.A. 1957).

n55 See *id.* at 548, 113 U.S.P.Q. at 534. ("Notwithstanding [35 U.S.C. § 112, P6], it is the language itself of the claims which must particularly point out and distinctly claim the subject matter which the applicant regards as his invention, without limitations imported from the specification, whether such language is couched in terms of means plus function or consists of a detailed recitation of the inventive matter. Limitations in the specification not included in the claim may not be relied upon to impart patentability to an otherwise unpatentable claim.").

n56 See 3 ADELMAN, *supra*, note 50, § 2.9[5], at 2-1172 (rel. no. 45, July 1991).

n57 I borrow the term "productive misunderstanding" from the late Franz Wieacker who explained that every historical encounter is at the same time a productive misunderstanding. See FRANZ WIEACKER, *PRIVATRECHTSGESCHICHTE DER NEUZEIT* 45 (2d ed. 1967) ("Die Aufnahme fortdauernder Elemente durch neue Kulturtzager fuhr nun zugleich immer Veranderungen des Elements herbei: jede geschichtliche Begegnung ist zugleich produktives Missverstehen.").

n58 See, e.g., *Markman v. Westview Instruments*, 52 F.2d 967, 976, 34 U.S.P.Q.2d (BNA) 1321, 1326 (Fed. Cir. 1995) (en banc), *aff'd*, 517 U.S. 370, 38 U.S.P.Q.2d (BNA) 1461 (1996).

n59 See *id.*

n60 See *id.*

n61 See, e.g., *Graver Tank & Mfg. Co. v. Linde Air Prods. Co.*, 339 U.S. 605, 607, 85 U.S.P.Q. (BNA) 328, 330 (1950).

n62 *Warner-Jenkinson*, 520 U.S. 17, 21, 41 U.S.P.Q.2d (BNA) 1865, 1869 (1997).

n63 755 F.2d 1570, 225 U.S.P.Q. (BNA) 236 (Fed. Cir. 1985).

n64 See *id.* at 1571, 225 U.S.P.Q. at 237.

n65 See *id.* at 1575, 225 U.S.P.Q. at 241.

n66 See *id.*

n67 See *Warner-Jenkinson*, 520 U.S. at 29, 41 U.S.P.Q.2d at 1877 ("The doctrine of equivalents must be applied to individual elements of the claim, not to the invention as a whole.").

n68 See *D.M.I.*, 755 F.2d at 1575, 225 U.S.P.Q. at 239 ("In applying the doctrine of equivalents . . . it must then be determined whether the *entirety of the accused device* . . . is so 'substantially the same thing, used in substantially the same way, to achieve substantially the same result' as to fall within that range [of equivalents]." (emphasis added) (quoting *Graver Tank Mfg. Co. v. Linde Air Prod. Co.*, 339 U.S. 605, 610, 85 U.S.P.Q. 328, 330 (1950))).

n69 See *id.* at 1575, 225 U.S.P.Q. at 241.

n70 *See id.*

n71 *See id.*

n72 762 F.2d 969, 226 U.S.P.Q. (BNA) 5 (Fed. Cir. 1985).

n73 767 F.2d 853, 226 U.S.P.Q. (BNA) 402 (Fed. Cir. 1985).

n74 *Id.* at 862, 226 U.S.P.Q. at 411 (emphasis added).

n75 813 F.2d 1196, 1 U.S.P.Q.2d (BNA) 2052 (Fed. Cir. 1987).

n76 833 F.2d 931, 4 U.S.P.Q.2d (BNA) 1737 (Fed. Cir. 1987) (en banc).

n77 813 F.2d at 1201, 1 U.S.P.Q.2d at 2057.

n78 833 F.2d at 934, 4 U.S.P.Q.2d at 1746.

n79 *See, e.g., Mas-Hamilton Group v. LaGard, Inc.*, 156 F.3d 1206, 1211-12, 48 U.S.P.Q.2d (BNA) 1010, 1015-16 (Fed. Cir. 1998); *Kegel Co. v. AMF Bowling, Inc.*, 127 F.3d 1420, 1428, 44 U.S.P.Q.2d (BNA) 1123, 1131 (Fed. Cir. 1997); *Micro Chem., Inc. v. Great Plains Chem. Co.*, 103 F.3d 1538, 1547, 41 U.S.P.Q.2d (BNA) 1238, 1247 (Fed. Cir. 1997); *Alpex Computer Corp. v. Nintendo Co.*, 102 F.3d 1214, 1222, 40 U.S.P.Q.2d (BNA) 1667, 1675 (Fed. Cir. 1996); *Greenberg v. Ethicon Endo-Surgery, Inc.*, 91 F.3d 1580, 1582, 39 U.S.P.Q.2d (BNA) 1783, 1785 (Fed. Cir. 1996); *Valmont Indus., Inc. v. Reinke Mfg. Co.*, 983 F.2d 1039, 1042, 25 U.S.P.Q.2d (BNA) 1451, 1454 (Fed. Cir. 1993); *Intellicall, Inc. v. Phonometrics, Inc.*, 952 F.2d 1384, 1388-89, 21 U.S.P.Q.2d (BNA) 1383, 1387 (Fed. Cir. 1992); *Laitram Corp. v. Rexnord, Inc.*, 939 F.2d 1533, 1536, 19 U.S.P.Q.2d (BNA) 1367, 1370 (Fed. Cir. 1991); *Johnston v. IVAC Corp.*, 885 F.2d 1574, 1580, 12 U.S.P.Q.2d (BNA) 1382, 1388 (Fed. Cir. 1989); *Texas Instruments, Inc. v. U.S.I.T.C.*, 805 F.2d 1558, 1562, 231 U.S.P.Q. (BNA) 833, 837 (Fed. Cir. 1986).

n80 *See, e.g., Polaroid Corp. v. Eastman Kodak Co.*, 789 F.2d 1556, 229 U.S.P.Q.2d (BNA) 561 (Fed. Cir. 1986) (relying, ironically, on *D.M.I.* as precedent to avoid a finding of invalidity by limiting a means-plus-function claim to the specific structure disclosed in the specification and equivalents thereof); *Constant v. Advanced Micro-Devices*, 848 F.2d 1560, 7 U.S.P.Q.2d 1057 (Fed. Cir. 1988).

n81 *See SmithKline Diagnostics, Inc. v. Helena Labs. Corp.*, 859 F.2d 878, 882, 8 U.S.P.Q.2d (BNA) 1468, 1472 (Fed. Cir. 1988) ("Claims must be interpreted and given the same meaning for purposes of both validity and infringement analyses.").

n82 796 F.2d 461, 230 U.S.P.Q. (BNA) 438 (Fed. Cir. 1986).

n83 888 F.2d 1370, 1375 n.1, 12 U.S.P.Q.2d (BNA) 1908, 1913 n.1 (Fed. Cir. 1989) ("Section 112 P6 cannot be ignored when a claim is before the PTO any more than when it is before the courts in an issued patent.").

n84 910 F.2d 831, 15 U.S.P.Q.2d (BNA) 1566 (Fed. Cir. 1990).

n85 *See, e.g., PATENT & TRADEMARK OFFICE, U.S. DEPT' OF COMMERCE, MANUAL OF PATENT EXAMINING PROCEDURE (MPEP) § 2181* (6th ed. rev. 3 1998).

n86 *See South Corp. v. United States*, 690 F.2d 1368, 1370 n.2, 215 U.S.P.Q. (BNA) 657, 659 n.2 ("The present adoption does not affect the power of this court, *sitting in*

banc, to overrule an earlier holding with appropriate explication of the factors compelling removal of that holding as precedent. If conflict appears among precedents, in any field of law, it may be resolved by the court *in banc* in an appropriate case." (emphasis added)).

n87 16 *F.3d* 1189, 29 *U.S.P.Q.2d* (BNA) 1845 (*Fed. Cir.* 1994) (en banc).

n88 *See id.* at 1193-94, 29 *U.S.P.Q.2d* at 1849.

n89 *See, e.g., Unique Concepts, Inc. v. Brown*, 939 *F.2d* 1558, 1565, 19 *U.S.P.Q.2d* (BNA) 1500, 1507 (*Fed. Cir.* 1991) (Rich, J., dissenting) (noting that this principle is based on "long-established precedent too well settled to require citation").

n90 *Donaldson*, 16 *F.3d* at 1195, 29 *U.S.P.Q.2d* at 1851 (emphasis added).

n91 *See Kegel Co. v. AMF Bowling, Inc.*, 127 *F.3d* 1420, 1427, 44 *U.S.P.Q.2d* (BNA) 1123, 1130 (*Fed. Cir.* 1997).

n92 *See Markman v. Westview Instruments, Inc.*, 52 *F.3d* 967, 34 *U.S.P.Q.2d* (BNA) 1321 (*Fed. Cir.* 1995) (en banc), *aff'd*, 517 *U.S.* 370 (1996).

n93 *See, e.g., Cybor Corp. v. FAS Techs., Inc.*, 138 *F.3d* 1448, 1456, 46 *U.S.P.Q.2d* (BNA) 1169, 1177 (*Fed. Cir.* 1998) (en banc).

n94 *See, e.g., North Am. Vaccine, Inc. v. American Cyanamid Co.*, 7 *F.3d* 1571, 1574, 28 *U.S.P.Q.2d* (BNA) 1333, 1336 (*Fed. Cir.* 1993).

n95 *See, e.g., Palumbo v. Don-Joy Co.*, 762 *F.2d* 969, 975, 226 *U.S.P.Q.* (BNA) 5, 11 (*Fed. Cir.* 1985) ("Whether [the] accused device is a § 112 equivalent of the described embodiment is a question of fact."); *D.M.I., Inc. v. Deere & Co.*, 755 *F.2d* 1570, 1575, 225 *U.S.P.Q.* (BNA) 236, 241 (*Fed. Cir.* 1985); *King Instrument Corp. v. Otari Corp.*, 767 *F.2d* 853, 862, 226 *U.S.P.Q.* (BNA) 402, 411 (*Fed. Cir.* 1985).

n96 *See, e.g., Laitram Corp. v. Rexnord, Inc.*, 939 *F.2d* 1533, 1536, 19 *U.S.P.Q.2d* (BNA) 1367, 1370 (*Fed. Cir.* 1991).

n97 *See Chiuminatta Concrete Concepts, Inc. v. Cardinal Indus, Inc.*, 145 *F.3d* 1303, 1312, 46 *U.S.P.Q.2d* (BNA) 1752, 1761 (*Fed. Cir.* 1998).

n98 The Federal Circuit recently summarized its efforts and stated its position in *Al-Site Corp. v. VSI Int'l, Inc.*, 174 *F.3d* 1308, 1319-22, 50 *U.S.P.Q.2d* (BNA) 1161, 1168-69 (*Fed. Cir.* 1999).

n99 *See, e.g., Texas Instruments, Inc. v. U.S.I.T.C.*, 805 *F.2d* 1558, 231 *U.S.P.Q.* (BNA) 833 (*Fed. Cir.* 1986); *D.M.I., Inc. v. Deere & Co.*, 755 *F.2d* 1570, 225 *U.S.P.Q.* (BNA) 236 (*Fed. Cir.* 1985).

n100 *See Dawn Equip. Co. v. Kentucky Farms Inc.*, 140 *F.3d* 1009, 1019 n.3, 46 *U.S.P.Q.2d* (BNA) 1109, 1119 n.3 (*Fed. Cir.* 1998) (Plager, J., additional views); *Endress + Hauser, Inc. v. Hawk Measurement Sys. Pty. Ltd.*, 122 *F.3d* 1040, 1043, 43 *U.S.P.Q.2d* (BNA) 1849, 1852 (*Fed. Cir.* 1997).

n101 *See Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 *U.S.* 17, 40, 41 *U.S.P.Q.2d* (BNA) 1865, 1888 (1997).

n102 See *Alpex Computer Corp. v. Nintendo Co.*, 102 F.3d 1214, 1222, 40 U.S.P.Q.2d (BNA) 1667, 1675 (Fed. Cir. 1996); *Valmont Indus., Inc. v. Reinke Mfg. Co.*, 983 F.2d 1039, 1043, 25 U.S.P.Q.2d (BNA) 1451, 1455 (Fed. Cir. 1993).

n103 See, e.g., *Valmont Indus.*, 983 F.2d at 1039-40, 25 U.S.P.Q.2d at 1451 ("A determination of section 112 equivalence does not involve the *equitable* tripartite test of the doctrine of equivalents. . . . The doctrine of equivalents *equitably* expands exclusive patent rights." (emphasis added)); *Charles Greiner & Co. v. Mari-Med Mfg., Inc.*, 962 F.2d 1031, 1035-36, 22 U.S.P.Q.2d (BNA) 1526, 1530-31 (Fed. Cir. 1992) ("The doctrine of equivalents is an equitable doctrine The . . . careful confinement of the doctrine of equivalents to its proper *equitable* role, promotes certainty and clarity in determining the scope of patent rights." (emphasis added)).

n104 62 F.3d 1512, 35 U.S.P.Q.2d (BNA) 1641 (Fed. Cir. 1995) (en banc), *rev'd on other grounds*, 520 U.S. 17 (1997) (note that the Supreme Court declined to address the issue whether the doctrine of equivalents was for the judge or the jury to decide).

n105 *Id.* at 1521, 35 U.S.P.Q.2d at 1650 ("In short, the Supreme Court's cases on the doctrine of equivalents foreclose a holding that the doctrine is a matter of equity to be applied at the court's discretion.").

n106 See, e.g., *WMS Gaming Inc. v. International Game Tech.*, 184 F.3d 1339, 1353, 51 U.S.P.Q.2d (BNA) 1385, 1394 (Fed. Cir. 1999); *Al-Site Corp. v. VSI Int'l, Inc.*, 174 F.3d 1308, 1320-21, 50 U.S.P.Q.2d (BNA) 1161, 1168 (Fed. Cir. 1999); *Mas-Hamilton Group v. LaGard, Inc.*, 156 F.3d 1206, 1215, 48 U.S.P.Q.2d (BNA) 1010, 1019 (Fed. Cir. 1998); *Intellicall, Inc. v. Phonometrics, Inc.*, 952 F.2d 1384, 1389, 21 U.S.P.Q.2d (BNA) 1383, 1388 (Fed. Cir. 1992).

n107 156 F.3d 1206, 48 U.S.P.Q.2d (BNA) 1010 (Fed. Cir. 1998).

n108 See *id.* at 1213, 48 U.S.P.Q.2d at 1017.

n109 184 F.3d 1339, 51 U.S.P.Q.2d (BNA) 1385 (Fed. Cir. 1999).

n110 See *id.* at 1343, 51 U.S.P.Q.2d at 1389.

n111 See *id.* at 1352, 51 U.S.P.Q.2d at 1394.

n112 See *id.*

n113 See *id.* at 1354, 51 U.S.P.Q.2d at 1395.

n114 See *Dawn Equip. Co. v. Kentucky Farms, Inc.*, 140 F.3d 1009, 1018-19, 46 U.S.P.Q.2d (BNA) 1109, 1118-19 (Fed. Cir. 1998) (Plager, J., additional views).

n115 See *id.*

n116 805 F.2d 1558, 231 U.S.P.Q. (BNA) 833 (Fed. Cir. 1986).

n117 *Id.* at 1568, 231 U.S.P.Q. at 843. For the prosecution history, see *Alpex Computer Corp. v. Nintendo Co.*, 102 F.3d 1214, 1219, 40 U.S.P.Q.2d (BNA) 1667, 1675 (Fed. Cir. 1996) and *Cole v. Kimberly-Clark Corp.*, 102 F.3d 524, 532, 41 U.S.P.Q.2d (BNA) 1001, 1009 (Fed. Cir. 1996).

n118 See *Texas Instruments*, 805 F.2d at 1571, 231 U.S.P.Q. at 843; see also *Dawn*, 140 F.3d at 1018 (Plager, J., additional views).

n119 762 F.2d 969, 226 U.S.P.Q. (BNA) 5 (Fed. Cir. 1985).

n120 *Id.* at 975 n.4, 226 U.S.P.Q. at 11 n.4.

n121 *See, e.g., WMS Gaming Inc. v. International Game Tech.*, 184 F.3d 1339, 1351-52, 51 U.S.P.Q.2d (BNA) 1385, 1393-94 (Fed. Cir. 1999).

n122 *See, e.g., Intellicall, Inc. v. Phonometrics, Inc.*, 952 F.2d 1384, 1389, 21 U.S.P.Q.2d (BNA) 1383, 1388 (Fed. Cir. 1992); *Laitram Corp. v. Rexnord, Inc.*, 939 F.2d 1533, 1539, 19 U.S.P.Q.2d (BNA) 1367, 1373 (Fed. Cir. 1991).

n123 *See, e.g., Dawn*, 140 F.3d at 1016, 46 U.S.P.Q.2d at 1116; *Valmont Indus., Inc. v. Reinke Mfg. Co.*, 983 F.2d 1039, 1044, 25 U.S.P.Q.2d (BNA) 1451, 1456 (Fed. Cir. 1993).

n124 Note that even commentators who believe in two sets of equivalents find "simply no sound justification for refusing to apply *Graver Tank* principles to the § 112, P6 equivalency determination." Mark D. Janis, *Unmasking Structural Equivalency: The Intersection of § 112, P6 Equivalents and the Doctrine of Equivalents*, 4 ALB. L.J. SCI. & TECH. 205, 227 (1994).

n125 145 F.3d 1303, 46 U.S.P.Q.2d (BNA) 1752 (Fed. Cir. 1998). The Federal Circuit recently reiterated the *Chiuminatta* principles in *Al-Site Corp. v. VSI International, Inc.*, 174 F.3d 1308, 50 U.S.P.Q.2d (BNA) 1161 (Fed. Cir. 1999).

n126 *Chiuminatta*, 145 F.3d at 1311, 46 U.S.P.Q.2d at 1760.

n127 *Id.* at 1310, 46 U.S.P.Q.2d at 1759.

n128 *See* 3 ADELMAN, *supra* note 50, § 2.9[5], at 2-1176.4 (rel. no. 57, July 1994).

n129 *See Chiuminatta*, 145 F.3d at 1311, 46 U.S.P.Q.2d at 1760.

n130 *See Al-Site*, 174 F.3d at 1320, 50 U.S.P.Q.2d at 1168 (despite extensive quotations from the Supreme Court's *Warner-Jenkinson* decision, the Federal Circuit was forced to cite its own decisions to back up its view that 35 U.S.C. § 112, P6 "restricts the scope of a functional claim as part of a *literal* infringement analysis" (emphasis added)).

n131 *Greenberg v. Ethicon Endo-Surgery, Inc.*, 91 F.3d 1580, 1582, 39 U.S.P.Q.2d (BNA) 1783 (Fed. Cir. 1996) (emphasis added).

n132 *See Graver Tank & Mfg. Co. v. Linde Air Prods. Co.*, 339 U.S. 605, 613-614, 85 U.S.P.Q. (BNA) 328, 332-33 (1950) (Black, J., dissenting).

n133 *See id.* at 614, 85 U.S.P.Q. at 332 (Black, J., dissenting).

n134 *See id.* at 615, 85 U.S.P.Q. at 333 (Black, J., dissenting).

n135 *See id.*

n136 *See* Martin J. Adelman & Gary L. Francione, *The Doctrine of Equivalents in Patent Law: Questions That Pennwalt Did Not Answer*, 137 U. PA. L. REV. 673, 680 (1989).

n137 *See, e.g., Al-Site Corp. v. VSI Int'l, Inc.*, 174 F.3d 1308, 1320 n.2, 50 U.S.P.Q.2d (BNA) 1161, 1168 n.2 (Fed. Cir. 1999) ("Patent Policy supports application of the doctrine of equivalents to a claim element expressed in means-plus-function form

in the case of 'after-rising' technology because a patent draftsman has no way to anticipate and account for later developed substitutes for a claim element.").

n138 See Harold C. Wegner, *Equitable Equivalents: Weighing the Equities to Determine Patent Infringement in Biotechnology and Other Emerging Technologies*, 18 RUTGERS COMPUTER & TECH. L.J. 1, 40 (1992) ("A key reform in application of the doctrine of equivalents should be a shift from the largely mechanistic application used in recent years to a greater recognition of the equitable nature of the doctrine." (citation omitted)).

n139 See 3 ADELMAN, *supra* note 50, § 2.9[5], at 2-1176.1 (rel. no. 57, July 1994).

n140 See *id.* 2-1176.3 (rel. no. 57, July 1994).

n141 See *In re Swinehart*, 439 F.2d 210, 213 n.4, 169 U.S.P.Q. (BNA) 226, 229 n.4 (C.C.P.A. 1971).

n142 See 3 ADELMAN, *supra* note 50, § 2.9[5], at 2-1176.3-.4 (rel. no. 57, July 1994).