§112, ¶6 Claim Interpretation and the Doctrine of Equivalents: An Invitation to Confused Thinking?

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§ 112, ¶ 6 Claim Interpretation and The Doctrine of Equivalents:

An Invitation to Confused Thinking

Julia Hodge

The style of claims is not the sine qua non of the patent right

—Judge Pauline Newman

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I. INTRODUCTION

Intellectual property is an asset and commodity of expanding value and importance in our increasingly technology-driven economy.\(^2\) The patent system seeks to stimulate technological advances and encourage research and development by providing financial rewards that make research and development profitable. One of the challenges that the patent system faces in meeting the goals of stimulating the technological economy is to provide a predictable body of law in a field in which the vagaries and inadequacies of language create impediments to the accurate description of intellectual property rights. Lack of certainty as to the metes and bounds of a property right decreases the value and fungibility of the right and drains the economy of resources by diverting energy toward sorting out ownership rights.

The interpretation of a patent's claims is at the heart of the ownership right. Although 35 U.S.C § 112, ¶ 6 authorizes claims written in functional terms, the law surrounding the interpretation of § 112, ¶ 6 claims is conflicted. In some instances a § 112, ¶ 6 claim has a smaller scope than if the claim described the structure of the device. A more uniform law of interpretation is necessary in order to direct focus on the import of the language of the claim and less on its form. “Since the law is to benefit the inventor's genius and not the scrivener's talents,”\(^3\) secondary considerations should be analyzed in determining the scope of a claim.

II. BACKGROUND

The 1952 revision of the Patent Act added what is now ¶ 6 of § 112, allowing patent claims to be drafted that describe an invention by the function performed by its components (i.e., drafted in means-plus-function language):

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

\(^2\) See Arlen Olsen, Patents are Big Moneymaker these Days for Companies, 27:19 CAP. DIST. BUS. REV. 29 (2000) (“During the year 1999, IBM alone raked in more than $1 billion in patent licensing royalties. This is derived from $30 billion of negotiation deals that it did during the year . . . . In 1990, it is estimated that in the United States alone $15 billion in revenue was derived from patent licensing. In 1998, that shot up 700 percent to $100 billion. It is predicted that by 2005, patent licensing revenues will top half a trillion dollars annually.”).

\(^3\) Autogiro Co. of Am. v. United States, 384 F.2d 391, 399 (Ct. Cl. 1967); id. at 396 (stating that “[c]laims cannot be clear and unambiguous on their face . . . . The very nature of words would make a clear an unambiguous claim a rare occurrence.”).
claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.4

This section clarified that functional claim language was valid, at a time when courts had formed various opinions on the subject and a 1946 Supreme Court case, *Halliburton Oil Well Cementing Co., v. Walker*,5 had prohibited the use of means-plus-function language to describe the most crucial element of a combination claim. The interpretation to be given to the statutory mandate, "such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof,"6 is currently a source of controversy in the Federal Circuit.

It has been argued that the judicially created doctrine of equivalents is codified in § 112, ¶ 6. If an accused infringer has changed the invention in an insubstantial way and the properly interpreted claims of a patent do not literally cover the accused device, the accused device still may infringe the patent under the doctrine of equivalents. To give no remedy against an infringer who has changed the invention in an insubstantial way would leave the patent-holder with an essentially valueless patent.7

In general, patent claims are interpreted with reference to the specification, the prosecution history8 of the application, if in evidence and, only if necessary, extrinsic sources such as scientific treatises or expert testimony.9 A resort to the prosecution history and/or extrinsic evidence to determine the extent of the invention serves the notice function in a less than ideal manner, but this non-ideality is outweighed by the equitable need to accommodate the inherent difficulty of adequately describing an invention with words. The inherent difficulty of adequate description is exacerbated in cases of complex or technologically novel inventions.

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8 The prosecution history of an application consists of, among other things, the statements made by the examiner about the patentability of the invention and arguments made by the patentee to induce the grant of the patent. These arguments frequently consist of explanations of the invention, discussions of the differences between the invention and the prior art and amendments to the claims to overcome the prior art.
III. OVERVIEW OF THE LAW

Language in a claim, such as "means for," raises a presumption that § 112, ¶ 6 applies to the claim element. Theoretically, any time minimal structure, or no structure at all, is recited for an element, § 112, ¶ 6 might apply. For literal infringement, a court must find identical function and identical, or equivalent, structure in the accused device. Identity, or equivalency, of structure is sometimes determined by comparing the physical structure disclosed in the specification (corresponding to the means-plus-function element in the claim) to the accused device. Read literally, a means-plus-function claim encompasses all structures that might perform the recited function. Section 112, ¶ 6 limits this scope by mandating that claims "be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof." ¹⁰

Controversy surrounds the question of whether the statutory equivalents in § 112, ¶ 6 are similar to the equitable equivalents of a doctrine of equivalents analysis ¹¹ or if, instead, they are the "doctrine of equivalents in a restrictive role," which apparently mandates a physical comparison of structures. Although a doctrine of equivalents analysis is often nominally applied, it is not clear that the application always leads to a claim with a fair scope. For example, in a recent line of cases from the Federal Circuit, the way prong of the function-way-result test reduces to a comparison of structures, i.e., the equivalency analysis reduces to a consideration of the physical structures of the two devices, a comparison that almost always leads to a finding of non-equivalency.

IV. RECENT CASES

"[T]he word 'equivalent' in § 112, ¶ 6 should not be confused... with the 'doctrine of equivalents.'" ¹²

D.M.I., Inc. v. Deere & Co. involved an invention for a "plow system with means for adjusting the spacing of plow units while the plow is in motion." ¹³ Deere, apparently having conceded that their

¹¹ See generally Graver Tank, 339 U.S. at 608 (finding that an equitable doctrine of equivalents analysis looks to the substantiality of the differences between the accused device and the claimed invention or a second test is applied that looks to whether the accused device performs "substantially the same function in substantially the same way to obtain substantially the same result." For a § 112, ¶ 6 claim, the function has been specified in the literal claim language.).
¹³ Id. at 1572.
plow system included all other limitations of the first claim of D.M.I.'s patent, contested that its plow system had a compensating means that was similar to the one claimed by D.M.I.'s patent. The compensating means was described in the patent's specification as a parallelogram structure.\(^{14}\) The Federal Circuit reversed the district court's holding that "D.M.I. cannot avoid its own patentee's definition of a 'compensation means' and claim equivalence in every structure which achieves the same result by a method and structure which do not even come close to falling within that definition."\(^{15}\) In reversing the grant of summary judgment, the court stated that although there might not be an issue of infringement under a § 112, ¶ 6 interpretation of "equivalent," the doctrine of equivalents might yield a different result. The court noted that the range of equivalents is evaluated "in light of the prosecution history, the pioneer-non-pioneer status of the invention, and the prior art,"\(^{16}\) in concluding that the means-plus-function clause scope should not be limited to structures employing a parallelogram.

Although D.M.I. did not discuss a definition for a § 112, ¶ 6 equivalent, implicit in the decision is the idea that a § 112, ¶ 6 equivalent is something different from and significantly narrower than the doctrine of equivalents' equivalent.\(^{17}\) In affirming the district court's holding of no literal infringement, the court in D.M.I. affirmed an interpretation of a § 112, ¶ 6 equivalent as a device that is very close to being the same as the structure disclosed in the specification.

In Valmont Industries, Inc. v. Reinke Manufacturing Co., the Federal Circuit reiterated that, "the word 'equivalent' in § 112 should not be confused, as it apparently was here, with the 'doctrine of equivalents.'"\(^{18}\) The court explained:

[In the context of section 112, . . . an equivalent results from an insubstantial change which adds nothing of significance to the structure, material, or acts disclosed in the patent specification. A determination of section 112 equivalence does not involve the equitable tripartite test of the doctrine of equivalents . . . . ‘[T]he sole question’ under § 112 involves comparison of the structure in the accused device which performs the claimed function to

\(^{14}\) See id.

\(^{15}\) Id. at 1573.

\(^{16}\) Id. at 1575.

\(^{17}\) See id.

The Federal Circuit continued:

[a] claim limitation described as a means for performing a function, if read literally, could encompass any conceivable means for performing the function . . . . Section 112 permits means-plus-function language in a combination claim, but . . . limits the applicant to the structure, material, or acts in the specification and their equivalents. Indeed the section operates more like the reverse doctrine of equivalents because it restricts the coverage of literal claim language.

The position of the court appears to be that the resort to the structures disclosed in the specification and equivalents to interpret the claims is meant to narrow the breadth of the claim; therefore, the range of equivalents given must be narrow. The reverse doctrine of equivalents is an equitable doctrine that arises when an accused device falls literally within the scope of the claim language. Under the reverse doctrine of equivalents, the accused device is found not to infringe if the accused device is “so far changed from the patented invention that it performs the same or a similar function in a substantially different way.”

A different statutory interpretation might conclude that the resort to the structure disclosed in the specification narrows the literal reach of the claim scope and the phrase “and equivalents thereof” thereafter expands it to its fair scope. The fact that a comparison with the disclosed structure narrows the breadth of the claim does not mandate a narrower range of equivalents also.

The patent-in-suit in Valmont claimed a center pivot irrigator for watering the corners of a field which included a control means for an extension arm. The structure disclosed in the specification as performing the function of controlling the extension arm was a device that sensed the angular relationship between the main arm and the extension arm in order to generate a signal to guide the extension arm. The accused irrigation system used a device that guided the extension arm by sensing electromagnetic signals from a buried cable. Applying a § 112 analysis, the court concluded that the two control

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19 See id.
20 Id. at 1042 (citing Johnston v. IVAC Corp., 885 F.2d 1574, 1580 (Fed. Cir. 1989)).
means were not structurally equivalent. The Court reached a similar conclusion applying a doctrine of equivalents function-way-result analysis, because the accused device performed substantially the same function and achieved substantially the same result in a very different way.\textsuperscript{23} The court did consider prosecution history to the extent that it noted Valmont argued, in an unsuccessful reissue proceeding\textsuperscript{24} for a patent for a buried cable steering system, that the buried cable system was not obvious over the patent-in-suit because the approaches were completely different.\textsuperscript{25}

Valmont was an unfriendly decision to the patent-holder in several respects. Although it is generally true as an evidentiary matter that a party's admissions are admissible evidence, it is not as clear that a party's admissions in one patent application are appropriately treated as 'prosecution history' in a second application. Additionally, the reissue application for the patent that would have covered the buried cable device was apparently denied by the Patent and Trademark Office (hereinafter, PTO) as obvious (not patentably distinct) over the patent Valmont was asserting in litigation (the angle comparison device). The Federal Circuit then held that the buried cable device was so far changed from the angle comparison device that no infringement under the doctrine of equivalents could be found.\textsuperscript{26} Although obviousness speaks to a slightly different issue,\textsuperscript{27} and would not be determinative of equivalency, obviousness is evidence of insubstantial differences.\textsuperscript{28} Thus, one forum held that the devices were very similar and another held that they were not, and the inventor lost out both times.

In addition, the Federal Circuit's application of the function-way-result test in Valmont, appeared to be based on similar considerations as its appraisal of structural equivalence. The court primarily discussed physical dissimilarities in concluding the devices operated in a substantially different way.

\textsuperscript{23} Valmont, 983 F.2d at 1044.
\textsuperscript{24} 35 U.S.C. § 251 (1994). A patentee can seek to have a granted patent reissued if the patentee has claimed more or less than the patentee had a right to, or if the patent is inoperative or invalid, by reason of a defective specification or drawings. Id. The patent is reexamined by the Patent and Trademark Office during the reissue proceeding. Id.
\textsuperscript{25} Valmont, 983 F.2d at 1045.
\textsuperscript{26} See id.
\textsuperscript{28} Some of the same considerations, such as the art-recognized interchangeability of two devices, enter into a determination of obviousness and of equivalency.
In *Dawn Equipment Co. v. Kentucky Farms, Inc.* the Federal Circuit applied a doctrine of equivalents analysis to a means-plus-function claim, but implied in a footnote that the legal propriety of applying the doctrine of equivalents to a claim drafted in means-plus-function form was unclear. The patented technology involved a mechanism for adjusting the height of a farm implement and the range of equivalents for a "means for locking and selectively releasing" a connector was at issue. In its equivalence analysis, the court applied the function-way-result test and considered several factors, such as that the mechanisms were structurally quite different, and operated quite differently and that the patent itself strongly suggested the two structures were not equivalent because the accused device had pins for locking the structures in place and the patent taught away from using pins.

In *Dawn Equipment*, all three judges filed additional opinions. Judge Plager wrote that he found "[t]he law in this area confused and confusing." He noted that there was a lack of clearly defined operational differences between the § 112, ¶ 6 notion of equivalents and the doctrine of equivalents. His opinion expressed his disagreement with the statement in *Valmont* suggesting that the function-way-result test was not applicable to determining equivalence under § 112, ¶ 6 and also expressed a belief that the way and result prongs were useful to the extent the test is useful at all.

Judge Plager concluded there should not be two notions of equivalents since it was "an invitation to confused thinking," and suggested that

the practice of claiming under § 112, ¶ 6 would be much improved if we adhered to the proposition that the 'equivalents' of 'structure, material, or acts described in the specification' are those found to be within the scope of that term as it is used in § 112, ¶ 6, and not elsewhere.

Judge Newman wrote separately, stating that no policy reason existed for eliminating access to the doctrine of equivalents for claims drafted in means-plus-function form. "The style of claims is not the

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30 *Id.* at 1015.
31 *Id.* at 1016.
32 *Id.* at 1018.
33 *See id.*
34 *Id.* at 1021.
35 *See Dawn Equip.*, 140 F. 3d at 1022.
sine qua non of the patent right, and the equitable purposes of the doctrine of equivalents do not rise and fall with whether the patentee used the claim form authorized in section 112 paragraph 6.\textsuperscript{36}

In \textit{Chiuminatta Concrete Concepts, Inc. v. Cardinal Industries, Inc.}, a case before Judges Michel, Plager and Lourie, the Federal Circuit defined the range of equivalents for a claim element drafted in means-plus-function form narrowly.\textsuperscript{37} The litigation involved two patents owned by Chiuminatta, one for a saw for cutting concrete before it had hardened completely and a second one for a method of cutting the incompletely cured concrete. The inventive features of the saw were an upwardly rotating leading edge on the blade and support feature for applying pressure to the surface of the concrete. The accused device met almost all the limitations of a claim literally, but it did not have a means for supporting the surface of the concrete adjacent to the leading edge of the cutting blade that was physically the same as the means disclosed in Chiuminatta’s patent. The structure disclosed in the patent for supporting the surface of the concrete was a skid plate, that was further described as a generally flat metal plate with rounded ends. The accused device supported the surface of the concrete adjacent to the leading edge of the saw with deformable wheels. Under operational conditions, the wheels flattened out and formed flat planes adjacent to the saw blade on the surface of the concrete.

In an opinion written by Judge Lourie, the Federal Circuit reiterated that where § 112, ¶ 6 applies, “[t]he proper test is whether the differences between the structure in the accused device and any disclosed in the specification are insubstantial.”\textsuperscript{38} The defendant, Cardinal, argued that “for a structure to be equivalent to a skid plate, it must include substantially all of the structural features of a skid plate, and thus must be hard, flat, and fixedly attached to the saw.”\textsuperscript{39} The Federal Circuit agreed with Cardinal’s element-by-element structural equivalence analysis and a finding of no literal infringement followed.

Although Chiuminatta argued that the wheels were equivalent to the skid plate because they were interchangeable in the Chiuminatta concrete saw, the court rejected the argument, stating “[s]uch evidence does not obviate the statutory mandate to compare the

\textsuperscript{36} See \textit{id.}
\textsuperscript{38} \textit{id.} at 1309.
\textsuperscript{39} See \textit{id.}
accused structure to the corresponding structure. The court also rejected Chiuminatta’s argument because known interchangeability in the abstract is not probative. Known interchangeability means that those of ordinary skill in the art recognized the interchangeability of plates with wheels for the specific purpose disclosed in the patent, i.e., for supporting the surface of the concrete.

The court next considered the doctrine of equivalents, stating “[a]lthough an equivalence analysis under § 112, ¶ 6, and the doctrine of equivalents are not coextensive (for example, § 112, ¶ 6, requires identical, not equivalent function) and have different origins and purposes, their tests for equivalence are closely related.” The opinion reiterated that equivalents under § 112, ¶ 6 “is an application of the doctrine of equivalents in a restrictive role” and suggested that “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.”

If the structure differs insubstantially from the structure disclosed in the specification but could readily have been disclosed in the specification, then no doctrine of equivalents analysis should apply. In contrast, if due to technological advances, an after-developed technology that could not have been disclosed in the patent, is an insubstantial change from what is claimed in the patent, then it should be held to infringe under the doctrine of equivalents. The Federal Circuit opined that “[t]here is no policy-based reason why a patentee should get two bites at the apple.”

Although the denial of equivalents, except for after-developed technologies, contradicts the general precept for a doctrine of equivalents analysis, Kraft Foods, Inc. v. International Trading Co. explicitly affirmed this rule for § 112, ¶ 6 situations. In Kraft Foods, the Federal Circuit held that since § 112, ¶ 6 language was not used in the claims-in-suit, equivalents could cover preexisting technology.

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40 Id. at 1310.
41 See id.
45 See id.
46 Id. at 1311.
48 Id. at 1373.
In *Chiuminatta*, the reader is left to wonder what type of device would have constituted infringement. One suggestion that seems to be supported by the case is that nothing short of literal identity to the skid plate would constitute infringement. Thus, it might be concluded under this opinion, that equivalents are not given for claims written in means-plus-function format.

Interestingly, the court in *Chiuminatta* further went on to find Chiuminatta’s method patent, that was directed to a method for cutting concrete before the concrete had hardened sufficiently to allow cutting by a conventional abrasive concrete saw, valid and infringed.49 Cardinal’s sales of the abovementioned saw induced infringement of the method patent. Thus, Chiuminatta essentially was able to obtain protection for all means of supporting the surface during the cutting of the concrete. For the method claim, the court held that Cardinal’s wheeled concrete saw induced infringement of Chiuminatta’s method patent.

In *Odetics, Inc.* v. *Storage Technology Corp.*, the Federal Circuit purported to interpret the test espoused in *Chiuminatta* for the interpretation of claims written in functional language according to § 112, ¶ 6 over a vigorous dissent by Judge Lourie (the author of the *Chiuminatta* opinion).50 The district court had granted a motion for JMOL51 after the jury returned a verdict of infringement for Odetics, the patent-holder, because it “deemed its . . . decision to be ‘mandated’ by ‘the analytical framework established’” by *Chiuminatta*.52 The Federal Circuit stated, “[b]ecause *Chiuminatta* did not mark a change in the proper infringement analysis under § 112, ¶ 6, . . . we . . . order the jury’s verdict reinstated.”53

The district court understood *Chiuminatta* to indicate that “statutory equivalence under § 112, ¶ 6 requires ‘component by component’ equivalence between the relevant structure identified in the patent and the portion of the accused device asserted to be structurally equivalent,” a reading that the Federal Circuit stated “misapprehends § 112, ¶ 6 infringement analysis and is therefore incorrect.”54 Interestingly, in discussing the law, the Federal Circuit cited similar cases for a similar proposition as had been cited in

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49 *Chiuminatta*, 145 F.3d at 1312-13.
51 Judgment as a matter of law.
52 *Odetics*, 185 F.3d at 1263.
53 See id.
54 Id. at 1266.
Chiumenta, including the statement that, "[s]tructural equivalence under § 112, ¶ 6 is, as noted by the Supreme Court, 'an application of the doctrine of equivalents . . . in a restrictive role.'"55 The Odetics court stated that equivalents under § 112, ¶ 6 "invokes the familiar concept of an insubstantial change."56 Additionally, equivalence under § 112, ¶ 6 is narrower than under the doctrine of equivalents because functional identity is required; thus, the function-way-result test only requires consideration of equivalence of the way and the result in a comparison between the asserted structure and the "corresponding structure, acts, or materials described in the specification."57

The majority explained, "[t]he similar analysis of equivalents under § 112, ¶ 6 and the doctrine of equivalents does not, however, lead to the conclusion that Pennwalt and Warner-Jenkinson command a component-by-component analysis of structural equivalence under § 112, ¶ 6."58 Although Warner-Jenkinson Co. v. Hilton Davis Chemical Co. mandates that a doctrine of equivalents infringement analysis compare the accused device to the claimed invention on an element-by-element basis, i.e., an accused device must have a part corresponding to each limitation of the claim or its equivalent, this test does not imply that within an element written in means-plus-function form, the structure disclosed in the specification must be met element-for-element by an accused structure.59 The element-by-element test applies to a claim as a whole and requires that each element of the claim be found literally or equivalently in the accused structure. A means-plus-function phrase, on the other hand, is a claim element, not a claim. "This is why structures with different numbers of parts may still be equivalent under § 112, ¶ 6."60

The technology in Odetics involved a robotic tape storage system.61 The parties contested the scope of a claim element directed to a rotary means for providing access to a storage library. The Federal Circuit had previously held that the corresponding structure in the specification implicated the components that receive force and rotate as a result of that force, i.e., a rod, gear, and rotary loading

55 Id. at 1267 (citing Warner-Jenkinson Co. v. Hilton Davis Chem. Co., 520 U.S. 17, 28 (1997)).
56 Odetics, 185 F.3d at 1267.
57 See id.
58 Id. at 1267-68 (citing Warner-Jenkinson, 520 U.S. at 28 and Pennwalt Corp. v. Durand-Wayland, Inc., 833 F.2d 931 (1987)).
59 Odetics, 185 F.3d at 1268.
60 See id.
61 Id. at 1263.
mechanism. The accused device used "cam followers," or pins, affixed to the bottom of the bin array to rotate the bin array. The majority agreed with Odetics that the parallels between the claimed and accused structures (i.e., that the patented device caused rotation by exerting force against the teeth of the gear and the accused device accomplished rotation by exerting force against the cam followers), made the two devices equivalent. The court discussed the expert testimony presented at trial in which the expert stated repeatedly "that the 'rotary means' structure was equivalent to the 'bin array' in the accused devices" and "noted that 'you can push on a pin as well as you can push on the gear tooth'" and "that the way that the two structures accomplish the claimed 'rotary' function, and the result of that function, is substantially equivalent."\(^6\)

Judge Lourie dissented from both the analysis of equivalency under § 112, ¶ 6 and the majority's conclusion.

If one is to determine whether the disclosed structure of a claimed means is equivalent to the corresponding structure of an accused device, I do not see how it is possible to do so without looking at what components the structures consist of, i.e., by deconstructing or dissecting the structures.\(^6^3\)

Additionally, the Judge Lourie disagreed with the majority's reliance on expert testimony that "served only to prove that the claimed gear and cam followers performed the same function"\(^6^4\) and he faulted the testimony as "a bare assertion that the two structures were equivalent."\(^6^5\) In other words, reliance on functional identity expands § 112, ¶ 6 beyond its intended limits because it allows any and every means to satisfy the claim limitation. Judge Lourie further expressed the opinion that expert testimony was not necessary to determine equivalency because structural analysis and comparison are relatively straightforward, i.e.,

[i]n the disclosed structure, the gear is a disc or cylinder with teeth that fit the teeth of another gear, thus enabling the disclosed gear to move in conjunction with the bin array, whereas the cam followers are smooth pins attached to the array by a stem, and turn independently from the array.\(^6^6\)

Despite the majority's assertion in Odetics that Chiuminatta did

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\(^6^2\) Id. at 1270.
\(^6^3\) Id. at 1277 (Lourie, J., dissenting).
\(^6^4\) See id.
\(^6^5\) Odetics, 185 F.3d at 1278 (Lourie, J., dissenting).
\(^6^6\) Id. (quoting Odetics, Inc. v. Storage Tech. Corp., 14 F. Supp. 2d 807, 814 (E.D.Va. 1998)).
not stand for the proposition that in § 112, ¶ 6 cases the accused structure and the disclosed structure should be deconstructed and compared to determine equivalence, others might disagree. Not only did the district court read *Chiuminatta* as stating this proposition, but the author of the dissent in *Chiuminatta*, Judge Lourie, indicated this was his view of the law. It is argued in this paper, that the test espoused by Judge Lourie far too frequently yields a similar result as does a test asking if the two structures are exactly the same. Recently, two more cases have been decided by the Federal Circuit that further illustrate the varying opinions among the judges regarding the proper interpretation of means-plus-function claims.

*IMS Technology, Inc. v. Haas Automation, Inc.* espouses a viewpoint most similar to that of the majority in *Odetics*. The case involved a computer-controlled machining tool. Among other issues, the parties contested the interpretation of a claim element directed to “a control means for transferring a control program . . . into alterable memory and for recording the . . . contents of said memory onto an external medium,” *i.e.*, a means for transferring and recording data. The specification disclosed a tape cassette as a means for recording data and the accused device used a floppy disk drive.

Despite a lack of physical similarity between the components of a tape and a floppy disk drive, the court found them to be equivalent under § 112, ¶ 6. The Federal Circuit stated that “the statute requires two structures to be equivalent, but it does not require them to be ‘structurally equivalent’, *i.e.*, it does not mandate an equivalency comparison that necessarily focuses heavily or exclusively on physical structure.”

The court attempted to distinguish *Chiuminatta*, stating, “[i]n other cases, in which the specific physical features of the structure corresponding to the ‘means’ limitation may have more relevance to the claimed invention, a finding of noninfringement results.” This distinction is not entirely satisfying since it might be argued that in *Chiuminatta*, the physical features of sliding across the surface of the concrete versus rolling are irrelevant to the invention, the heart of which lies in applying pressure to the surface of the concrete as it was being cut.

However, the court in *IMS* went on to say, “we consider the

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68 Id. at 1427.
69 Id. at 1436.
70 See id.
substantiality of their [the floppy disk drive and the tape drive's] differences in the context of the claimed invention.\(^\text{71}\) Since, in the court's opinion, this did not seem to be a case in which any physical features of the interface means, such as the physical format of recorded data or the mechanism for accessing data, were important to the invention, an issue existed as to whether the devices were equivalent. Further, the evidence supplied by IMS, that one of ordinary skill in the art would have recognized the interchangeability of a floppy disk drive and a tape cassette for recording data, is relevant in the issue of equivalence.

In IMS, the court gave little consideration to the physical structures of the disk drive and the tape drive.\(^\text{72}\) Certainly, both record data on magnetic media, but a tape operates serially, in that a tape is moved past a stationary head and stored on reels on either end, whereas a disk drive has a movable head(s) and a disk that is round, flat, and spins. Perhaps it is because a disk and a tape are well-known art-recognized equivalents or perhaps because there is a tendency to treat computers and their component parts as black boxes, focusing only on their function, a finding of non-equivalence seems improbable. For this reason, IMS is perhaps a demonstration of the inadequacy of a test focusing inordinately on the physical structures of an accused and disclosed device.

In another recent case, Kemco Sales, Inc. v. Control Papers Co.,\(^\text{73}\) the Federal Circuit (opinion by Judge Lourie) agreed with the district court that no reasonable jury could find infringement either literally or under the doctrine of equivalents for an accused envelope that had adhesive in a different location than that disclosed in the specification for the invention. The patent was directed to plastic security envelopes that are tamper-evident, \(i.e.,\) like other envelopes, they can be opened by applying low temperatures to the adhesive region, but unlike other envelopes they cannot be resealed without leaving evidence of having been opened. The disputed claim element, "a plastic envelope closing means,"\(^\text{74}\) in one embodiment, was a flap that folded over the envelope's opening and was glued to the outside of the envelope by two types of adhesive, a conventional one and a tamper-evident one. The accused envelope placed the regular adhesive on the inside edge of the open end of the envelope, and the

\(^{71}\) Id. at 1437.

\(^{72}\) See id.

\(^{73}\) Kemco Sales, Inc. v. Control Papers Co., 208 F.3d 1352 (Fed. Cir. (2000)).

\(^{74}\) Id. at 1355.
tamper-evident adhesive on a flap that sealed to the outside of the envelope. In holding that the accused envelope did not infringe, the Federal Circuit, like the district court before it, discussed and compared physical structures.

Although the Court appeared to apply the way and result prongs of a doctrine of equivalents analysis, the application of the test focused on the physical structures of the two envelopes.

Unlike the disclosed flap, which closes by folding over the envelope, the dual-lip structure closes the accused envelope in a different way by meeting together and binding via the internal adhesive. The accused structure... also yields a substantially different result. The first and second sealing means in the disclosed structure are ultimately attached to the outside of the envelope. In contrast, the first sealing means in the TripLok envelope is internally attached to the two lips of the dual-lip structure, thereby sealing the envelope.75

Despite having applied a potentially narrower function-way-result analysis, i.e., one focused more heavily on structure than is typically applied in doctrine of equivalents situations, the court went on to hold that a structure failing a § 112, ¶ 6 equivalents analysis should also fail a doctrine of equivalents analysis. The court reasoned that both types of equivalents resorted to an analysis of the way and result therefore a failure in one should be considered a failure in the other.

The court also appeared to back away from its holding in Chiuminatta that the doctrine of equivalents should only be applied to after-developed technologies in § 112, ¶ 6 cases. Although the issue was brought up by the parties, the Federal Circuit applied the doctrine of equivalents to an existing technology embodied in the accused device.

V. LEGISLATIVE HISTORY

The content of ¶ 6 was added to Section 112 during the revision of the Patent Act that was codified into law in 1952. Although its legislative history is not abundant, it is generally accepted76 that ¶ 6, which allows claims to be drafted using functional language without the recital of structure, was enacted as a response to a Supreme Court decision in Halliburton Oil Well Cementing Co. v. Walker.77 In

75 Id. at 1365.
77 Halliburton Oil Well Cementing Co. v. Walker, 329 U.S. 1 (1946) superseded by statute as stated in In re Donaldson Co., 16 F.3d 1189 (Fed. Cir. 1994).
Halliburton Oil, the Supreme Court considered the acceptability of functional claim language to describe an element of a claim for a combination of admittedly old elements, at "the exact point of novelty." The patent involved a device for determining the depth of an oil well using sonic echoes, which improved the accuracy of the measurement over preexisting devices through the addition of a component for measuring known distances of features (tubing joints) along the sides of the well. The Supreme Court held the claim invalid for indefiniteness, and faulted Walker, the patentee, for attempting to enforce the claim as though it could prevent any machine, which performed the function of clearly and distinctly catching and recording echoes from tubing joints, from being used in the claimed combination. The Court reasoned,

[In this age of technological development there may be many other devices beyond our present information or indeed our imagination which will perform that function and yet fit these claims. And unless frightened from the course of experimentation by broad functional claims like these, inventive genius may evolve many more devices to accomplish the same purpose.]

The Court seemingly did not reach the issue that a patent could be obtained on the new device itself (i.e., outside the confines of the improvement invention), or that the reverse doctrine of equivalents could be applied (with reference to the disclosed structure) to narrow the reach of the claim. The rule stated by the Court that no infringement would be found for after-developed technologies used to perform the function claimed in the patented combination is no longer the law.

For the drafting of the Patent Act of 1952, "[t]he Drafting Committee . . . was given the task of preparing . . . a codification that contained only changes on which substantial agreement of the patent community could be obtained." The 1952 Act is generally understood to be a response to the increasing tendency to invalidate patents in the courts that developed in the 1930s and 1940s. An

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78 Halliburton Oil, 329 U.S. at 8.  
79 Id. at 12.  
80 See Warner-Jenkinson, 520 U.S. at 37 (1997) ("Insofar as the question under the doctrine of equivalents is whether an accused element is equivalent to a claimed element, the proper time for evaluating equivalency — and thus knowledge of interchangeability between elements — is at the time of infringement, not at the time the patent was issued.").  
82 See L. James Harris, Some Aspects of the Underlying Legislative Intent of the Patent Act of
article by Rudolph Hoffman and Edward Heller discusses the legislative history in some depth and concludes by recommending that § 6 be amended, keeping the provision allowing means-plus-function language in combination claims, but deleting the resort to the specification to determine the corresponding structure and equivalents thereof. The enunciated goal behind the suggestion is for “a combination claim having elements described in functional terms to be subjected to the same treatment as any other claim,” by allowing the courts free reign, unhampered by statutory language to determine a body of law.

It is argued here that a call for an absence of statutory direction is misplaced because clear statutory mandates proved a buffer against court-driven trends toward invalidation and contraction of patent grants. Additionally, a reasonable statutory interpretation resulting in an application of the doctrine of equivalents can result in a fair claim scope because a fair application of the doctrine of equivalents can yield a uniform claim scope independent of the language used in drafting the claim.

There is evidence that the drafters of the Act intended to codify the application of the doctrine of equivalents to claims drafted using functional language. The Honorable Joseph R. Bryson stated in an address before the Philadelphia Patent Law Association,

> [a]ll the elements of a combination now will be able to be claimed in terms of what they do as well as in terms of what they are. This has been strongly recommended by the patent bar . . . . This provision also gives recognition to the existence of the doctrine of equivalents.

Additionally, L. James Harris, patent counsel for the Drafting Committee, has commented, “[i]t was felt by the drafters that means claims should be permitted in combination claims . . . to provide for the proper interpretation of the claims commensurate with the invention, the doctrine of equivalents is specifically mentioned in the section.”

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See Hofmann, Jr. & Heller, III, supra note 81.

Id. at 290.


See Harris, supra note 82, at 687-88.
In a footnote, Harris cites two cases approvingly in which "[c]ourts have interpreted means-function clauses to protect what is disclosed and equivalents."\(^{87}\) In *Ford Motor Co. v. Gordon Form Lathe Co.*, the Sixth Circuit stated the law as, "[a]n inventor cannot by the mere use of the word 'means' appropriate any and all kinds of mechanism or devices which may perform the specified function, or any other mechanism or device than that which is described in the patent or which is its mechanical equivalent."\(^{88}\) The court then found that the result accomplished by the tool and the type of work it was able to perform, was different than that which could be performed by the patented tool.\(^{89}\) Probably most damning, the accused tool did not have the same function (purpose) as claimed in the patent. Thus, the court in *Ford Motor Co.*'s finding of non-infringement was reached because the accused device did not perform the claimed function. A question was left on how the court's statement of the law would apply to a device which did perform the same function.

In *Buono v. Yankee Maid Dress Corp.*, Judge L. Hand writing for a majority in the Second Circuit, held claims containing functional elements infringed because "[t]he defendant has taken everything which the Buonos contributed to the art, with mechanical variations too trivial to deserve discussion."\(^{90}\) The case implied the invention did not reside in the particular method of performing the function recited, but in the performance of the function itself. The disputed claim element, in a claim for a sewing machine, was for an operating means which turned a pivoted device at predetermined intervals.

The court explained, "[t]he invention did not reside in the mechanical train connecting the eccentric with the table, but in a train which should tilt it at intervals longer than the oscillations of the rib. The details not being important, the general notion so embodied the inventors might protect."\(^{91}\) The court acknowledged the difficulty in determining the appropriate range of mechanical equivalents by saying, "[i]t is only a question of how far the functional element is anchored in the disclosure, and how far it floats as a vague threat in the art. That is a question of degree, and admits of no general solution . . . ."\(^{92}\)

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87 See Harris, *supra* note 82, at 688 n.146 (citing Ford Motor Co. v. Gordon Form Lathe Co., 87 F.2d 390 (6th Cir. 1937) and Buono v. Yankee Maid Dress Corp., 77 F.2d 274 (2d Cir. 1935)).
88 Ford Motor Co., 87 F.2d at 392.
89 See id.
90 Buono, 77 F.2d at 277.
91 See id.
92 See id.
A focus on where the invention resides seems more equitable than a focus solely on structure. As noted by Hoffman and Heller, and demonstrated in Chiuminatta, even if a functional claim is narrowed to cover essentially the disclosed structure, a method claim can provide broad coverage of all structures performing the claimed function. In Chiuminatta, although the accused saw was found not to infringe the device patent, a method patent directed to cutting incompletely cured concrete based on the same invention did cover the accused device. A focus on where the invention resides potentially avoids inconsistent results between device and method patents.

Furthermore, as a result of the Patent Bar’s involvement in drafting the amendments, the drafters of the Act took notice of the difficulties experienced by practitioners drafting patent applications. Specifically, Harris noted that, “[g]reater use of means in combination claims should simplify claim drafting and add to their clarity . . . . The lack of new structural terminology to keep pace with the increasing complexity of modern technology will . . . favor the practical advantages of ‘means’ claims.”

VI. THE DOCTRINE OF EQUIVALENTS

If an accused device meets every limitation of a claim, it is said to infringe the claim literally. If the accused device does not meet every claim limitation literally, courts will apply the doctrine of equivalents, and if the accused structure is determined to be an equivalent, the accused structure infringes the patent. The policy for allowing an accused device that does not fall literally within the claims to nevertheless infringe a patent was stated in Graver Tank & Manufacturing Co. v. Linde Air Product Co.: to permit imitation of a patented invention which does not copy every literal detail would be to convert the protection of the patent grant into a hollow and useless thing. Such a limitation would leave room for—indeed encourage—the unscrupulous copyist to make unimportant and insubstantial changes and substitutions in the patent which, though adding nothing, would be enough to take the copied matter outside the claim, and hence outside the reach of the law.

The Court offered an additional test, “[a] patentee may invoke

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93 See Harris, supra note 82, at 688.
95 Id. at 607.
this doctrine . . . 'if [the accused device] performs substantially the same function in substantially the same way to obtain the same result.'96 The case in Graver Tank involved the substitution of manganese for magnesium in an electric welding process for fluxes. In finding that the manganese silicate was the equivalent of the magnesium silicate in the flux, the Court stated, "[w]hat constitutes equivalency must be determined against the context of the patent, the prior art, and the particular circumstances of the case. Equivalence, in patent law, is not the prisoner of a formula and is not an absolute to be considered in a vacuum."97 The Court further noted that "[a]n important factor is whether persons reasonably skilled in the art would have known of the interchangeability of an ingredient not contained in the patent with one that was" and went on to consider expert testimony regarding the purposes served by the manganese and magnesium silicates in the fluxes and the known interchangeability of the two compounds in fluxes.98

In Warner-Jenkinson,99 the Supreme Court affirmed the viability of the doctrine of equivalents as enunciated in Graver Tank.100 It further refined and narrowed its application by stating that the doctrine of equivalents must be applied to individual elements of the claim, not to the invention as a whole. An element-by-element approach ensures that a "plethora of meaningful limitations" in the claims are not erased or ignored. Additionally, it announced a rebuttable presumption to be applied against the patentee, such that if the patent claims were amended during prosecution, it would be presumed that the claims were amended to avoid prior art, and thus a range of equivalents would be precluded. The Court noted that "the proper time for evaluating equivalency—and thus knowledge of interchangeability between elements—is at the time of infringement, not at the time the patent was issued."101

The Supreme Court in Warner-Jenkinson addressed the inadequacy of the two tests for equivalence, the "insubstantial differences test" and the "function, way, result" test, and noted that there was "substantial agreement" that the "function, way, result" test might be more suitable for analyzing mechanical inventions than for

96 Id. at 608.
97 Id. at 609.
98 See id.
100 See id.
101 Id. at 37.
products or processes and "the insubstantial differences test offers little additional guidance as to what might render any given difference 'insubstantial.'" After noting the inadequacy of linguistic formulations of a test, the Supreme Court expressed confidence that the Federal Circuit would refine the test over the course of case-by-case determinations.

Using a "concept borrowed from obviousness determinations - objective indicia" to analyze equivalence, Mary Consalvi discusses factors that have been considered by the Federal Circuit as evidence of equivalence or non-equivalence. She suggests that review and balancing of such factors should be used to determine equivalence in a manner similar to the way secondary considerations are used in obviousness determinations. Specifically, several factors are potentially relevant, including the pioneering status of the invention, a long-felt need for the patented invention and the alleged equivalent, commercial success of the accused or patented invention and evidence of independent development, of efforts to design around or evidence of copying. These factors seek to determine the relative contributions to the art of the patentee and of the alleged infringer and the extent to which the accused device uses the teachings of patented device.

If the accused device is a small improvement or no improvement and the patented device is a large improvement in the art, this would tend to indicate equivalence. Evidence that an accused device has received a patent, and thereby has been found to be non-obvious over the prior art device, is evidence of non-equivalence. It is not conclusive evidence, though, since the prior art patent may still dominate the improvement patent. Additionally, evidence that the accused infringer attempted to design around the device can be relevant in demonstrating non-equivalence. From a policy perspective, designing around is encouraged, and evidence that the accused infringer has spent large sums of money should be evidence

102 Id. at 40.
104 Id. at 175.
105 Id. at 175-78 (noting that just as in the case of obviousness considerations, some of these factors may be more relevant than others. For instance, evidence of commercial success may be due to marketing efforts rather than superiority of the invention.).
106 Id. at 184 (citing Roton Barrier, Inc. v. Stanley Works, 79 F.3d 1112 (Fed. Cir. 1996)).
107 Id. at 185.
of substantial differences.\textsuperscript{108} Other indicia are evidence of interchangeability and interoperability between the structures in the accused and patented device.

In situations in which the function-way-result or substantiality of the differences tests do not seem adequate or satisfying, evidence of the above secondary considerations may yield a more equitable result. This is especially true in § 112, ¶ 6 cases in which a comparison of physical structures yields an unfairly narrow claim scope.

VII. APPLICATION OF THE DOCTRINE OF EQUIVALENTS TO FUNCTIONAL CLAIM ELEMENTS

Although the use of a means claim is never entirely unavoidable, frequently there is not a simple generic term for the device being claimed. Language is a reflection of necessity and happenstance; and if a class of devices is in common usage, most likely there will be a generic word describing the devices. In contrast, if a device is part of a specialized art or very new, there might not be a word that generically describes variations on a functional theme adequately. To have the scope of claims vary depending on whether the inventor/drafter is lucky enough to find a generic word (e.g., scale describes a generic class of devices that weigh objects and includes mechanical balances, electronic top-loading devices and devices with hanging pans) or a word that describes a class of devices by the function they perform (e.g., fastener, spreader, plug or light) is a bit unfair.

In discussing existing law, the Manual of Patent Examining Procedure (MPEP) § 2181\textsuperscript{109} states that a presumption arises that § 112, ¶ 6 applies if the claim is drafted as a "means for performing function X." "[T]he use of the term 'means' (particularly . . . 'means for') generally invokes section 112(6) and that the use of a different formulation generally does not."\textsuperscript{110} The former practice of the PTO in examining applications, in accordance with the mandate to give claims the broadest reasonable interpretation, was to interpret a means-plus-function claim as reading for any prior art means for performing the function. Since the Federal Circuit decision in In re

\textsuperscript{108} Id. at 186-87 (noting, though, that caution should be exercised because it is possible that large sums were expended on failed experiments, and the accused infringer thereafter copied the patented device).

\textsuperscript{109} MANUAL OF PATENT EXAMINING PROCEDURE § 2181 (7th ed. 1998). The MPEP is a reference published by the PTO and used by patent examiners, applicants, and attorneys. It contains guidelines for the examination of patent applications.

\textsuperscript{110} Greenberg v. Ethicon Endo-Surgery, Inc., 91 F.3d 1580, 1584 (Fed. Cir. 1996)).
Donaldson, Co., the PTO still searches the prior art for all devices that perform the claimed function, but now gives the applicant the opportunity to rebut that the prior art device is the equivalent of the structure disclosed in the applicant's specification. However, the MPEP § 2184 notes that in determining the range of equivalents for a disclosed structure, an equivalent may be broad enough to encompass all structures performing the claimed functions—for instance, where (among other situations) "apparatus claims are treated as indistinguishable from method claims."

Thus, although there seems to be a tendency in the courts to narrow the scope of a broad claim drafted in means-plus-function form, there actually may be times in which a range of equivalents as broad as the literal language of the claim may be appropriate. Since the application has been examined in the PTO according to its broadest reasonable interpretation, a presumption arises that the claim is valid over the prior art for all means that satisfy the function requirement. If a prior art device does fall within the ambit of the claims, the prosecution history will disclose this fact and prosecution history estoppel will narrow the claims.

If a choice exists between a range of equivalents that is somewhere between the disclosed structure and the literal claim language, it is unfair to narrow the claim for the range of equivalents to be nearly anything that is the disclosed structure and nothing more. In Chiuminatta and Kemco Sales, the decision holding that the patents were not infringed was based essentially upon an element-by-element comparison of the structures. Even when the function-way-result test was applied in Kemco Sales, the court focused on the disclosed structures. Focusing exclusively on the disclosed structures yields no real consideration of equivalents, i.e., either the structures are almost exactly the same or they are not.

Undoubtedly, if the patentee had known that the claim would be interpreted narrowly, the patentee would have drafted claims to the structures involved, perhaps avoiding means-plus-function language by finding a broad generic term, or perhaps the patentee would have combed the literature to fill the disclosure with every conceivable means. If the patentee had drafted the claims to the structures, the claims might not have included every element of structure that the court now includes in its element-by-element analysis. Thus, perhaps a fair literal interpretation of the claims should require the court to

111 In re Donaldson Co., 16 F.3d 1189 (Fed. Cir. 1994).
112 MANUAL OF PATENT EXAMINING PROCEDURE § 2184 (7th ed. 1998).
draft a hypothetical claim that claims the structure as broadly as possible by focusing only on the essential features.\textsuperscript{113}

Unfortunately, a hypothetical claim is not helpful in situations in which functional language has been used to generically claim structures that are very disparate. The suggestion that the patentee has to include every possible structure is contrary to the PTO policy that a patent does not need to include everything known in the prior art. Many patents do not end up as profitable products and a requirement that a patentee search the literature for every possible means is an onerous one.

In order to give claim elements their fair scope, the analysis of a § 112, ¶6 claim should begin with the premise that an acceptable range of equivalents actually could be what is literally claimed, and a doctrine of equivalents analysis beyond a comparison of physical structures should be applied. An accused device would literally infringe a § 112, ¶6 element if it performed the same function and was the disclosed structure. For a device that did not literally infringe, a doctrine of equivalents analysis would determine an equitable range of equivalents and whether the accused device fell within that range. An equitable range of equivalents is somewhere between the disclosed structure and the literal claim language.

Arguably, this is still less than a non-statutory doctrine of equivalents analysis because the equivalency analysis does not broaden the literal claim language. Given the difficulty of determining the elements of structure that actually would have been claimed, and the inadequacy of verbal formulations of an equivalency test (i.e., function-way-result, or insubstantial differences), the determination of equivalency should be heavily weighted toward secondary considerations.

For example, in \textit{Chiuminatta}, a more satisfying decision might have been premised on whether the device in \textit{Chiuminatta} solved a problem that existed in the art (i.e., the sparring and cracking of wet concrete when it was cut) and whether it is to be regarded as a patent in a non-crowded art, perhaps one that even rises to the status of a pioneer invention. The heart of the invention in \textit{Chiuminatta} involved applying pressure to the concrete at the point of cutting in

\textsuperscript{113} See Wilson Sporting Goods, Co. v. David Geoffrey & Assoc., 904 F.2d 677, 684 (Fed. Cir. 1990) (using a hypothetical claim to determine the appropriate scope of equivalents in view of the prior art. The court stated, "It may be helpful to conceptualize the limitation on the scope of equivalents by visualizing a hypothetical patent claim, sufficient in scope to literally cover the accused product. The pertinent question then becomes whether that hypothetical claim could have been allowed by the PTO over the prior art.").
order to solve the problem of sparring and cracking. A range of equivalents that included squishy wheels might be appropriate if the wheels flatten out under operation to provide an essentially flat surface supporting the concrete at the position of cutting, the only difference between the accused and disclosed device being that the wheels roll along, flattening as they go—a difference that provides little or no improvement in the invention (i.e., the wheels are an exact substitute). Such considerations might indicate squishy wheels add nothing except to take the copied matter outside the literal reach of the claim.

On the other hand, perhaps the Chiuminatta device was one of many for cutting wet concrete in a crowded art, and the squishy wheels provided an improved means for supporting the concrete because they deformed to the shape of the imperfections in the concrete surface and thereby eliminated or even further reduced sparring or cracking or advantageously allowed cutting even earlier in the process. This fact might lead to an equitable conclusion that the wheels were not equivalents (although it is possible for the wheels to be patentable improvements and still infringe a pioneer patent).

Ultimately, it is more satisfying to have weighed equitable considerations in reaching a decision than to have done something unenunciated or to have compared physical structures.

VIII. CONCLUSION

The patent right granted should be commensurate with the scope of the invention. In § 112, ¶ 6 cases, the patentee has claimed broadly, and has had this broad language evaluated by the Patent and Trademark Office for patentability. In interpreting the claims, it is not adequate merely to compare physical structures of an accused and a disclosed device to determine infringement.

In order to give claims falling under the auspices of § 112, ¶ 6 their fairest interpretation, the doctrine of equivalents should be applied, and secondary considerations should weigh heavily in the decision. Although the legislative history is sparse, the drafters appear to have intended to codify the doctrine of equivalents. Despite the fact that the doctrine is now codified and not equitable, its application should yield a similar claim scope for claims drafted to similar inventions, independent of the exact verbal formulation of the claims. Consistent with the cases the drafters cited with approval, the range of equivalents should be allowed to be as large as the literal claim language in appropriate situations. Secondary considerations
should influence the determination of the range of equivalents so that the claim is given its fair scope.