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EQUIVALENTS AND THE FEDERAL CIRCUIT

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Adam B. Landa*
254 East 68th Street
Apartment 27 B
New York, NY 10021
(212) 744-2093

*B.S. I.S.M./Physics, S.U.N.Y. Buffalo, Registered Patent Agent, J.D., 1992, Franklin Pierce Law Center, Currently Associated with the Firm of Ostrolenk, Faber, Gerb & Soffen

TABLE OF CONTENTS

I. Introduction 1

1. Literal Infringement 1
2. Infringement Under the Doctrine of Equivalents 2
   (a) The Doctrine of Equivalents 2
   (b) *The All-Elements Rule* 2

II. The Infringement Analysis 4

1. The Claim Requirements 4
2. The Inquiries 5
   (a) The Scope of the Claims 6
   (b) Encompassing the Accused Structure 8

III. Equivalents - The Doctrine of Equivalents 9

   (a) *Winans v. Denmead* 10
   (b) *Graver Tank* the Current Precedent 12
   (c) The Doctrine of Equivalents Since Graver 14

IV. Forming the All Element Rule 15

1. Hughes Aircraft Co. v. United States 16
2. Perkin-Elmer Corp. v. Westinghouse Elec. Corp. 18
3. Malta v. Schulmerich Carillons, Inc. 20

V. Statutory Equivalents: the Means-Plus-Function Claim 21

1. 35 U.S.C. § 112, paragraph 6 23
2. An Example of *Means-Plus-Function* Language 24
3. Method Claims and Statutory Equivalents 29
4. Determining Statutory Equivalents 30
   (a) *Texas Instruments . v. United States Int'l Trade Comm'n* 30
   (b) *Valmont Industries Inc. v. Reinke Manufacturing Co., Inc.* 32

VI. Equivalents, Equivalents or Equivalents. 33

VII. Conclusion 37

I. Introduction

The drafting of a patent claim is clearly more of an art than a science. The challenge exists in using language to describe invention. Quite often, in litagatory hindsight, the claims of a patent are not as precise as we had attempted to make them at the time of drafting. A colleague of mine recently commented on an amendment that I had just completed, and said: "great trees will be felled from forests to supply the paper which litigators will use to fight over what you mean by that." And in context, I reread my claim, and found it to be clear to me.

The interpretation of a claim is the linchpin of patent law. In a patent, the patentee is entitled to be their own lexicographer, thus, words may have an ordinary meaning, a particular meaning to the patentee or, as is often the case, a precise meaning attached to them by case law. Generally, there are two different types of infringement: literal infringement, and infringement under the doctrine of equivalents.

1. Literal Infringement

The language of a patent claim describes the metes and bounds of the invention protected by the patent. One who, without authority, makes, uses or sells a patented invention, during its term, infringes the patent. 35 U.S.C. § 271(a). Infringement of a patent claim is found where an accused device *reads on* the language of the patent claim. To *read on* the

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language of a claim, each claimed element must be present in the accused device. A device which literally *reads on* the language of the patent claim is said to literally infringe. The finder of fact determines whether an asserted patent *reads on* an accused device.

2. *Infringement Under the Doctrine of Equivalents*

(a) The Doctrine of Equivalents

When literal infringement is not present, it is within the equitable power of the court to find that a device, which appropriates the material features of a patented invention, is an infringement. This equitable power is called the doctrine of equivalents. Although this doctrine had been around for many many years, its most cited incarnation is the courts enunciation in Graver Tank & Mfg. Co. v. Linde Air Products Co., 339 U.S. 605, 608, 85 U.S.P.Q. 328 (1950) which states:

> "To temper unsparing logic and prevent an infringer from stealing the benefit of an invention"[1] a patentee may invoke this doctrine to proceed against the producer of a device "if it performs substantially the same function in substantially the same way to obtain the same result."[2]

(b) *The All-Elements Rule*

Recently, The Court of Appeal for the Federal Circuit asserted the *all-elements* rule; that is, where an element of a claim is entirely missing, there is no infringement. Pennwalt

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[1] Royal Typewriter Co. v. Remington Rand, 168 F.2d 691, 692

[2] Sanitary Refigerator Co. v. Winters, 280 U.S. 30, 42

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Corp. v. Durand-Wayland, Inc., 833 F.2d 931, 937, 4 U.S.P.Q.2d (BNA) 1737, 1741 (Fed. Cir. 1987) (in banc) cert. denied, 108 S.Ct 1226 (1988). This rule is used in conjunction with the doctrine of equivalents, requiring all elements of the claimed invention to be present in the accused device before a finding of infringement lies.

It is axiomatic, however, that an element is not missing if an equivalent has been substituted. Thus, infringement under the doctrine of equivalents can **only** be found where *all-elements* of the patent claim, or their substantial equivalent are present.

The term element may be used to mean a single limitation, but it has also been used to mean a series of limitations which, taken together, make up a component of the claimed invention. In the *all-elements* rule, it is used in the sense of a limitation of a claim. Corning Glass Works v. Sumitomo Electric U.S.A., Inc., 868 F.2d 1251, 9 U.S.P.Q.2d (BNA) 1962 (Fed. Cir. 1989) "If a claim limitation or its substantial equivalent is not present, there can be no infringement." Julien v. Zerinque, 864 F.2d 1569, 1571, 9 U.S.P.Q.2d (BNA) 1552, 1553 (Fed. Cir. 1989).

It is important to note that claim limitations cannot be ignored because the public is entitled to rely upon them to avoid infringement. Pennwalt Corp., 833 F.2d at 935, 4 U.S.P.Q.2d at 1739.

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II. The Infringement Analysis

1. The Claim Requirements

Beginning with the Patent Act of 1836, an applicant for patent was required to "particularly point out the part, improvement, or combination, which he claims as his own invention or discovery." 1836 Patent Act, Ch. 357, 5 Stat. 117, Section 6. (1836).

Essentially, the 1836 Act required the *claiming* of an invention, such *claims* being the metes and bounds of the invention. Accused devices which fall within these boundaries are said to *read on* the patent, and literally infringe. Conversely, accused devices which fall outside these boundaries cannot literally infringe.

Today, a patent specification must end with one or more claims particularly pointing out, and distinctly claiming the subject matter which the applicant regards as his invention. 35 U.S.C. § 112, paragraph 2.

A claim may be written in independent or dependent form. 35 U.S.C. § 112, paragraph 3. A claim written in dependent form incorporates by reference all the limitations of the claim from which it depends. 35 U.S.C. § 112, paragraph 4. Thus, by definition, if an accused structure infringes a dependent claim, it must infringe the independent claim from which that dependent claim depends.

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It is worthwhile to take a moment and recognize that patent law does not provide remedy for the number of claims which are infringed by an accused structure, but instead for the number of accused structures which infringe one or more claims. See generally, 35 U.S.C. § 281, et seq. Thus, a claim depending from another claim is of no immediate apparent value.

The dependent claim, however, has significant value. For instance, where the parent claim is held invalid, the dependent claim, which by definition includes further limitation, may still be valid. But, another valuable use for the dependent claim exists, because of the doctrine of claim differentiation, Hormone Research Foundation, Inc. v. Genentech, Inc., 904 F.2d 1558, 15 U.S.P.Q.2d (BNA) 1039 (Fed. Cir. 1990) cert. dismissed, 111 S.Ct 1434 (1991), -- which states that each claim should be presumed to cover a different invention Laitram Corp. v. Rexnord, Inc., 939 F.2d 1533, 19 U.S.P.Q.2d (BNA) 1367 (Fed. Cir. 1991) -- a dependent claim may be used to help interpret what terms mean in other claims in a patent. Kalman v. Kimberly-Clark Corp., 713 F.2d 760, 218 U.S.P.Q. 781 (Fed. Cir. 1983) cert. denied, 104 S.Ct 1284 (1984).

2. *The Inquiries*

Determination of patent infringement entails two inquiries: the scope of the claim or claims; and whether the claims encompass the accused structure. Texas Instruments, Inc. v. United States Int'l Trade Comm'n, 805 F.2d 1558, 231 U.S.P.Q.

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(BNA) 833 (Fed. Cir. 1986), aff'd, 846 F.2d 1369, 6 U.S.P.Q.2d (BNA) 1886, (Fed. Cir. 1988), rehearing en banc denied, 7 U.S.P.Q.2d (BNA) 1414 (Fed. Cir. 1988). This analytical framework applies whether the claims are asserted to be infringed literally, or by application of the doctrine of equivalents. Id.

(a) The Scope of the Claims

The true meaning of disputed claim language is determined by reference to the claims and the specification. Loctite Corp. v. Ultraseal Ltd., 781 F.2d 861, 867, 228 U.S.P.Q. 90, 93 (Fed. Cir. 1985). "It is entirely proper to use the specification to interpret what the patentee meant by a word or a phrase in the claim." E.I. Du Pont de Nemours & Co. v. Phillips Petroleum Co., 849 F.2d 1430, 1433, 7 U.S.P.Q.2d (BNA) 1129, 1131 (Fed. Cir. 1988). The importance of claim interpretation cannot be understated. It is only a properly interpreted claim that may be compared to an accused device, and

> [o]nce an interpretation has been made, that same interpretation must be employed in determining literal infringement and infringement under the doctrine of equivalents.
>
> Senmed, Inc. v. Richard-Allan Medical Indus., 888 F.2d 815, 818, 12 U.S.P.Q.2d (BNA) 1508, 1511 (Fed. Cir. 1989).

The question of patent infringement is therefore hinged upon the interpretation of the claims.

The seemingly clear question of infringement is often clouded by the interpretation of the language used in the claim. Claim interpretation is a question of law, and thus solely the

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province of judicial interpretation. Proper interpretation of the claim is a prerequisite for a meaningful finding of infringement. In close cases, proper interpretation of claim language is often dispositive on the issue of literal infringement.

A Patentee, by definition being the first to invent an inventions, is at a distinct advantage as they may claim all that they feels is the subject matter of their inventions. The patent examiner's function is, at least, to make sure that what is claimed is in fact patentable. The patentee then has the freedom to claim all they desire, limited only by their inventions and the prior art. See generally 35 U.S.C. § 102, and 35 U.S.C. § 103. It is for this reason that claims are read in light of the careful phraseology chosen by the inventors. Pennwalt Corp., 833 F.2d at 937, 4 U.S.P.Q.2d at 1741.

The drafter of the claim is faced with the inimical problem of creating a claim that will thwart future imitators who will possess knowledge not known at the time of drafting. Now couple the general frailty of language with the increasing complexity of patentable subject matter and it is difficult to conceive of a claim which could not be the subject of more than one reasonable interpretation. Nonetheless, the legal question -- the interpretation of the claim -- must be determined as a condition precedent to any finding of infringement. And literal

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infringement is found only where each and every element of the claimed invention is present in the accused device.

(b) Encompassing the Accused Structure

Generally, a claim is for a combination, that is a combination of elements or limitations[3] which together comprise the patentable invention. It would certainly be hard to imagine

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[3] "References to "elements" can be misleading. "Elements" often is used to refer to structural parts of the accused device or of a device embodying the invention. "Elements" is also used in the phrase "an element of a claim" in 35 U.S.C. § 112, paragraph 6. An element of an embodiment of the invention may be set forth in the claim ... . It is the limitation of a claim that counts in determining both validity and infringement, and a limitation may include descriptive terms ... . Because claims are composed of a number of limitations, the limitations have on occasion been referred to as "claim elements" or "elements of the claim," but clarity is advanced when sufficient wording is employed to indicate when "elements" is intended to mean a component of an accused device or of an embodiment of an invention and when it is intended to mean a feature set forth in or as a limitation in a claim." Perkin-Elmer Corporation v. Westinghouse Electric Corporation, 822 F.2d 1528; 3 U.S.P.Q.2D (BNA) 1321 (Fed. Cir. 1987) (Footnote 9). See also discussion in *all-elements* section, infra, regarding the differentiation between an element and a limitation.

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a claim for a mechanical device which consisted of a single element. And a claimed combination contains no patented portion; it is the combination which is patented. Porter v. Farmers Supply Service, Inc., 790 F.2d 882, 229 U.S.P.Q. 814 (Fed. Cir. 1986).

To find infringement, an accused device must comprise every limitation of the claim. Although there need not be a one-to-one correspondence between the claim limitations and the elements of the accused device. For example a single element in a device could comprise two or more claim limitations. Likewise, infringement is not avoided in an accused device by comprising a single claim limitation only by a combination of device elements.

Similarly, the presence of additional of elements is insufficient to overcome infringement. Data Line Corp. v. Micro Technologies, Inc., 813 F.2d 1196, 1201, 1 U.S.P.Q.2D (BNA) 2052, 2055 (Fed. Cir. 1987). Even if the additional elements are patentably distinct from the original invention, infringement cannot be avoided.

It is the presence of each and every limitation in an accused device leads to a finding of infringement.

III. Equivalents - The Doctrine of Equivalents

If literal infringement is not found, the courts have used their equitable powers to find infringement under the *doctrine of equivalents*. The *doctrine of equivalents* is designed to do equity, and to relieve an inventor from a semantic strait jacket

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when equity requires. It is not designed to permit wholesale redrafting of a claim to cover more than an insubstantial change.

Of course, the public has a right to rely on the words of a claim, subject to reasonable interpretations of that claim. This patent law policy, as in similar policies found in property law generally, allows the public to determine *a fortiori* whether a particular action will be a trespass. The stringent requirements of literal infringement were imposed upon the language of a claim to promote certainty. The *doctrine of equivalents,* on the other hand, is judicially created to do equity where *inequity would otherwise result.*

(a) *Winans v. Denmead*

The Winans v. Denmead, 15 How. 330, decision was "the first decision to do serious damage to the literal meaning of the language of a patent claim." Chisum, Patents, Section 18.02[1]. The majority realized that it would be unreasonable to apply the language of the claim literally and thereby deny the inventor his rights under patent law. The dissent contended that the public must be given fair notice of what is being claimed as the invention.

The Winans patent pertained to a railroad car for transporting coal. The patent claimed a car having a body shaped in the form of a frustum of a cone to provide balance to the coal load. The Supreme Court held that octagonal and pyramidal shaped railroad cars infringed. This was based upon the sum of the

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evidence showing that the accused railroad cars achieved all of the advantages of the patented invention. Chisum, Patents, Section 18.02[1].

The doctrine of equivalents was born. Now, even if an accused device is found not to literally infringe an asserted patent, infringement may still be found under the doctrine of equivalents.

The constant conflict between its two policy considerations -- fair notice versus the prevention of inequitable pirating[4] -- often proving the doctrine to be its own nemesis. Even today, the courts struggle with the conflict of these necessary considerations in every determination of infringement under the doctrine of equivalents.

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[4] It is interesting to note that the policy of fair notice is directed to the public at large. The policy of protecting invention is directed only to patentees. The author believes that one of the considerations that should be factored in, is the general notion that the needs of the many often outweigh the needs of the few. Although generally the patentee has a larger interest than the public in his patent, the interest of the public as a whole must be considered against the backdrop of the patentee's rights and responsibilities in drafting the claims to define his invention.

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(b) *Graver Tank* the Current Precedent

In 1950 the Supreme Court again recognized that the infringement inquiry is directed to whether there has been a pirating of the invention. Graver Tank, 339 U.S. 605, 85 U.S.P.Q. 328. The Court determined that a patentee should not be deprived of the benefits of his patent by competitors who appropriate the essence of the invention while barely avoiding the literal language of the claims. See Laitram Corp. v. Cambridge Wire Cloth Co., 863 F.2d 855, 856-57, 9 U.S.P.Q.2d (BNA) 1289, 1291 (Fed. Cir. 1988), cert. denied, 490 U.S. 1068, 109 S.Ct. 2070, 104 L. Ed. 2d 635 (1989) Accordingly, the modern incarnation of the doctrine of equivalents emerged. Although designing or inventing around patents to make new inventions is encouraged, piracy is not. Thus, where an infringer, instead of inventing around a patent by making a substantial change, merely makes an insubstantial change, essentially misappropriating or even "stealing" the patented invention, infringement may lie under the doctrine of equivalents. Wallace London v. Carson Pirie Scott & Co., 946 F.2d 1534, 20 U.S.P.Q.2D (BNA) 1456 (Fed. Cir. 1991) (Citing Graver Tank, 339 U.S. at 609-10, 85 U.S.P.Q. (BNA) at 331; Lockheed Aircraft Corp. v. United States, 213 Ct.Cl. 395, 553 F.2d 69, 82, 193 U.S.P.Q. (BNA) 449, 461 (1977)).

As stated by Learned Hand, the doctrine is invoked "[t]o temper unsparing logic and prevent an infringer from stealing the

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benefit of an invention ...", Royal Typewriter Co. v. Remington Rand, 168 F.2d 691, 692, "[a] patentee may invoke this doctrine to proceed against a producer of a device 'if it performs substantially the same function in substantially the same way to obtain the same result.' Sanitary Refrigerator Co. v. Winters, 280 U.S. 30, 42." Graver Tank, 339 U.S. at 608.

Realizing that the term "equivalency" is rather amorphous terminology which evaded ready definition, the *Graver Tank* Court stated that:

> [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 the patent law, is not the prisoner of a formula and is not an absolute to be considered in a vacuum.

339 U.S. at 608.

Equivalency is necessarily determined on a case by case basis, and almost by definition cannot be the subject of a discrete set of rules whereby it can be properly determined. Instead, the equitable doctrine is considered *de novo* in each equivalency determination. The Court struggled with defining the term equivalency itself:

> [Equivalency] does not require complete identity for every purpose and in every respect. In determining equivalents, things equal to the same thing may not be equal to each other and, by the same token, things for most purposes different may sometimes be equivalents.

339 U.S. at 608.

Realizing the inherent ambiguity in determining equivalency, such ambiguity quite possibly exacerbated by their own

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definition, the Court described factors which could be utilized in the ultimate determination of equivalency:

> Consideration must be given to the purpose for which an ingredient is used in a patent, the qualities it has when combined with the ingredients, and the function which it is intended to perform. An 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.

339 U.S. at 608.

Thus, the equitable doctrine of equivalents, often stated as the function-way-result test, is used to determine whether an accused device and a claimed invention are equivalent; if so, the accused device is an infringement.

(c) The Doctrine of Equivalents Since Graver

The court has admonished that analysis under the doctrine of equivalents is not a necessary step in every infringement analysis. In Wallace London, 946 F.2d 1534, 20 U.S.P.Q.2d (BNA) 1456, the court stated that:

> [a]pplication of the doctrine of equivalents is the exception, however, not the rule, for if the public comes to believe (or fear) that the language of patent claims can never be relied on, and that the doctrine of equivalents is simply the second prong of every infringement charge, regularly available to extend protection beyond the scope of the claims, then claims will cease to serve their intended purpose. Competitors will never know whether their actions infringe a granted patent.

Even from this statement, it is still quite clear that the policies underlying the doctrine are at odds, but the court cautioned against the assertion of the *doctrine of equivalents* as a matter of course.

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However, if an accused device is close enough to a claimed invention to bring an infringement action in good faith, and if that action fails for want of literal infringement, how can the patentee not claim that the benefit of the invention has been appropriated and therefore infringes under the doctrine. Despite the courts warning, woe be the attorney who fails to assert the doctrine to properly protect the patentee's rights. In an action for infringement it would seem awkward (if not malpractice) to fail to assert the doctrine, if, for example, literal infringement cannot be found, yet the accused device is equivalent and therefore infringement can still be found under the doctrine. Thus, a proper infringement analysis would (i) compare the properly interpreted claim language with the accused device to see if there is literal infringement, and if not, (ii) determine whether the accused device is an equivalent of the claimed invention and therefore infringes under the doctrine of equivalents.

IV. Forming the All Element Rule

As considered, *infra*, infringement may be found under the doctrine of equivalents if an accused device performs substantially the same overall function or work in substantially the same way, to obtain substantially the same overall result as the claimed invention. Perkin-Elmer Corp. v. Computervision Corp., 732 F.2d 888, 901-902, 221 U.S.P.Q.2d (BNA) 669, 679 (Fed. Cir. 1984), cert. denied, 469 U.S. 857, 83 L.Ed.2d 120, 105 S.Ct.

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187 (1984). The doctrine is limited, however, in that it will not extend to cover an accused device in the prior art, nor will it allow a patentee to recapture coverage given up during prosecution. Loctite Corp., 781 F.2d 861, 228 U.S.P.Q. 90. The doctrine's equitable purpose is to do justice, it cannot "... erase a plethora of meaningful structural and functional limitations of the claim on which the public is entitled to rely in avoiding infringement." Perkin-Elmer Corp., 822 F.2d 1528, 3 U.S.P.Q.2d (BNA) 1321.

1. Hughes Aircraft Co. v. United States

The invention in Hughes Aircraft Co. v. United States, 717 F.2d 1351, 219 U.S.P.Q. 473 (Fed. Cir. 1983), was directed to a space satellite which would properly align its antennas with the Earth. Aboard the satellite was a sun sensor which was used to determine the satellite's current orientation. The positional data from the sun sensor was transmitted to Earth, and the Earth station computed and transmitted back to the satellite instructions to fire attitude jets to reestablish correct orientation of the satellite.

The representative claim was an apparatus claim for a space satellite which contained multiple elements, e.g. it was a claim for a combination, some of the elements were written in *means-plus-function*[5] form. The accused device replaced three of

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[5] *Means-plus-function* claims are discussed in detail, infra.

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the elements with an onboard computer. The elements replaced included:

> means for providing an indication of spin angle to a location external to the satellite;
>
> means for receiving control signals from the external source; and
>
> means for applying fluid to a fluid expansion means within a fixed time period in response to the receipt of a control signal from the external location.

The defendant's onboard computer did not: (a) transmit data to an external source; (b) receive a control signal from that external source; or (c) respond to the received signal -- all limitations expressly required by the claim limitations.

Because of the absence of these affirmatively recited limitations, the court determined that literal infringement did not exist. The court was then confronted with the issue of applying the doctrine of equivalents to claims found not to literally infringe the patent in suit.

The court held that a variation in technique, wherein the defendant, in following the patent's teachings, has merely employed a modern day computer to do indirectly what the inventor taught it to do directly -- an embellishment made possible by post-invention technology -- does not allow the accused device to escape the web of infringement. The mere substitution of such an

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embellishment does not avoid infringement. Hughes Aircraft Co., 717 F.2d 1351, 219 U.S.P.Q. 473.

2. Perkin-Elmer Corp. v. Westinghouse Elec. Corp.

In Perkin-Elmer Corp. v. Westinghouse Elec. Corp., 822 F.2d 1528, 3 U.S.P.Q.2d (BNA) 1321 (Fed. Cir. 1987), the appellate dispute centered around two clauses, (e.g. limitations), of the claim which represented "tap coupling". The defendant's accused device, however, employed "loop coupling".

The Court of Appeals for the Federal Circuit cited Lemelson v. United States, 752 F.2d 1538, 1551, 224 U.S.P.Q. (BNA) 526, 533, (Fed. Cir. 1985), for the proposition that "each element of a claim is material and essential, and for a court to find infringement, the plaintiff must show the presence of every element or its substantial equivalent in the accused device." The Court went on, however, to say

> [t]o be a "substantial equivalent," the element substituted in the accused device for the element set forth in the claim must not be such as would substantially change the way in which the function of the claimed invention is performed.

Perkin-Elmer Corp., 822 F.2d at 1533, 3 U.S.P.Q.2d (BNA) 1321.

The Court pointed out that there is dicta that suggests that consideration of the "essence", "gist" or "heart" of the invention may be helpful in determining infringement under the doctrine of equivalents in Loctite Corp., 781 F.2d 861, 228 U.S.P.Q. 90 and Atlas Powder Co. v. E.I. Du Pont de Nemours & Co., 750 F.2d 1569, 1582, 224 U.S.P.Q. (BNA) 409, 418 (Fed. Cir.

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1985) (both citing Medtronics, Inc. v. Cardiac Pacemakers, Inc., 721 F.2d 1563, 1567, 220 U.S.P.Q. (BNA) 97, 101 (Fed. Cir. 1983)). The Court pointed out, however, that that dicta may not be read as implying that specific claim limitation can be ignored as insignificant or immaterial in determining infringement. Instead, the Court noted that it must be read as shorthand for the considerations set forth in Graver Tank, i.e., that the infringer should not appropriate the invention by making substitutions for those limitations, when the substitutions do not substantially change the function performed, or the way it is performed by the invention. Perkin-Elmer Corp., 822 F.2d 1528, n.9, 3 U.S.P.Q.2d (BNA) 1321 n.9. The Court rejected the plaintiff's argument that the claim could be read as a "coupler" instead of a "tap coupler", specifically in light of the lack of explanation of why it was not claimed that way.

Infringement, literal or under the doctrine of equivalents, requires that every limitation of a claim be met literally or by a substantial equivalent. Intellicall Inc. v. Phonometrics Inc., 21 U.S.P.Q.2d (BNA) 1383, 1387 (Fed. Cir. 1992); Key Mfg. Group, Inc. v. Microdot, Inc., 925 F.2d 1444, 1449, 17 U.S.P.Q.2d (BNA) 1806, 1810 (Fed. Cir. 1991); Johnson v. IVAC Corp., 885 F.2d 1574, 1577, 12 U.S.P.Q.2d (BNA) 1382, 1384 (Fed. Cir. 1989); Corning Glass Works, 868 F.2d at 1259, 9 U.S.P.Q.2d at 1967; ZMI v. Cardiac Resuscitator Corp., 844 F.2d 1576, 1582, 6 U.S.P.Q.2d (BNA) 1557, 1562 (Fed. Cir. 1988); Uniroyal Inc. v. Rudkin-Wiley

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Corp., 837 F.2d 1044, 1054, 5 U.S.P.Q.2d (BNA) 1434, 1441 (Fed. Cir.) cert. denied, 488 U.S. 825 (1988). Although it was not stated as such, the *all-elements* rule was clearly used to permit the defendant to escape infringement under the doctrine of equivalents. The appeals court accepted the district court's finding that the "tap point" and its positioning for purposes of frequency tuning and impedance matching, as claimed, is one of the cardinal structural-functional-operational interrelationships -- ergo, "loop coupling" was not its substantial equivalent.

3. Malta v. Schulmerich Carillons, Inc.

In Malta v. Schulmerich Carillons, Inc., 21 U.S.P.Q.2d (BNA) 1161 (Fed. Cir. 1991), infringement under the doctrine of equivalents had been found and the remaining issue on appeal was whether the *all-elements* rule had been satisfied, e.g., whether all elements of the claims at bar were contained in the accused hand bells. The Court of Appeals for the Federal Circuit made it clear that it had never adopted the tripartite Graver Tank approach for determining equivalency of a limitation. In fact, they pointed out that in Pennwalt Corp., 833 F.2d at 937, 4 U.S.P.Q.2d at 1741, where the patentee had not established the presence, in the accused device, of every claim element or its substantial equivalent, a finding of non-infringement would be upheld.

Unfortunately, the Court was compelled to note that there was no test set forth as to how one proves that an element in an

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accused device is a substantial equivalent of the claim limitation. This question, however, is not without any resolution in case law. As the Malta Court noted, citing Corning Glass Works, 868 F.2d 1251, 9 U.S.P.Q.2d (BNA) 1962, comparison using the tripartite test from Graver Tank is **an acceptable way** of showing that a structure in an accused device is the "substantial equivalent" of a claim limitation. Of course, this is not the only acceptable way, the Corning and Malta courts, inter alia, have declined to propose a formula of general applicability for determining equivalency to a claim limitation. "The doctrine is judicially devised to do equity." Hughes Aircraft Co., 717 F.2d at 1361, 219 U.S.P.Q. at 480.

V. Statutory Equivalents[6]: the Means-Plus-Function Claim

In response to the Supreme Court's ruling in Halliburton Oil Well Cementing Co. v. Walker, 329 U.S. 1 (1946) which prohibited the use of *means-plus-function* language for the most crucial element of a combination claim, Congress added language to the Patent Act which permitted an element in a claim for a

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[6] For the purpose of this paper, and hopefully for the convenience of those hereafter confronted with this issue, the term "statutory equivalents" will hereafter be used to denote the particular equivalents referred to in § 112, paragraph 6; equivalents in the *doctrine of equivalents* sense, or in the *substantial equivalents* (*all-elements*) sense, or in the English language sense notwithstanding.

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combination to be expressed as a means for performing a function. Now, an element may be claimed through the use of *means-plus-function* language. The Patent Act at 35 U.S.C. § 112, paragraph 6, specifically permits an inventor to claim:

> [a]n element in a claim for a combination ... as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof ... .

35 U.S.C. § 112, paragraph 6. (It is, however, difficult to imagine a single element claim in, for instance, the mechanical arts, let alone a single element claim claimed as a means for performing a function, thus the limitation to combination claims is, in general, just common sense.)

In answer to the Court's articulated concern, (See Halliburton, 329 U.S. 1), that such language was overbroad and ambiguous, Congress provided specifically how such language was to be interpreted. Congress detailed the precise statutory reach, or interpretation, of claim language so written, thus the statute provides:

> [a *means-plus-function*] claim shall be construed to cover the corresponding structure, material, or acts described in the specification and **equivalents** thereof. [emphasis supplied]

35 U.S.C. § 112, paragraph 6. In Pennwalt, this Court clearly stated that:

> section § 112 paragraph 6 rules out the possibility that any and every means which performs the function specified in the claim literally satisfies that limitation.

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Pennwalt Corp., at 934, 4 U.S.P.Q.2d at 1739. That is, § 112 operates as a restriction to the literal satisfaction of the claims. Id.

Of course, not all embodiments of each element must exist in the specification. In other words, the law cannot be construed to require that an applicant describe in his specification, every conceivable and possible future embodiment of his invention. Texas Instruments, Inc. v. United States Int'l Trade Comm'n, 805 F.2d 1558, 231 U.S.P.Q. 833. It is clear that a *means-plus-function* claim can be construed to cover, not only the embodiments (of each element) disclosed in the specification, but their *statutory equivalents* as well.

In summary, the reach of a *means-plus-function* element (in a literal infringement analysis) extends beyond that which is disclosed in the specification, yet it is limited by the statute to less than all which its words literally encompass.

1. 35 U.S.C. § 112, paragraph 6

The 1952 Patent Act, 35 U.S.C. §§ 1-376 as amended, states that "[t]he specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention." 35 U.S.C. § 112, paragraph 2. Generally a claim should contain "(1) a preamble ..., (2) a phrase such as 'wherein the improvement comprises,' and (3) and those elements, steps and / or relationships which constitute that portion of the claimed

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combination which the applicant considers as the new or improved portion." 37 C.F.R. § 1.75(e). There is no specific rule as to the language or format of claims, a claim may be written in a plethora of differing yet equally correct forms.

2. *An Example of Means-Plus-Function Language*

Among the forms in which a claim may be presented, is the so called *means-plus-function* form. Unlike other claim formats, 35 U.S.C. § 112, paragraph 6 specifically provides for the *means-plus-function* element of a claim.

As an example of the means plus function language consider the following sample claim element in a hypothetical claim for a digital thermometer: "an LCD display that displays temperature." This a claim element could not be literally infringed by, for instance, a mercury thermometer.

Contrast that with the following *means-plus-function* claim language: "means for temperature display" -- the language of which suggests that it literally extends to all means for performing the stated function. That is, however, simply not the case. Quite the contrary, the claim comprising this element would extend only to means for temperature display possessing structures that are the *statutory equivalent* of those structures for temperature display found in the specification.

In other words, "section 112, paragraph 6, rules out the possibility that any and every means which performs the function specified in the claim literally satisfies that limitation."

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Pennwalt Corp., 833 F.2d at 934, 4 U.S.P.Q.2d (BNA) 1737. Although encompassing equivalents of structures disclosed in the specification, the provision of paragraph 6, nevertheless, acts as a restriction on the literal satisfaction of a claim limitation. Id. (citing Data Line Corp., 813 F.2d at 1201, 1 U.S.P.Q.2D at 2055) Properly understood § 112, paragraph 6 operates more like the reverse doctrine of equivalents[7] than the doctrine of equivalents because it restricts the scope of the literal claim language. Johnston v. IVAC Corp., 885 F.2d 1574, 12 U.S.P.Q.2D (BNA) 1382 (Fed. Cir. 1989).

To properly determine what is encompassed by a § 112, paragraph 6 claim element, the statute directs us to the specification. The claim, and therefore the element, is "construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof."[8]

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[7] The reverse doctrine of equivalents, although never upheld as a basis for a finding of non-infringement in the Court of Appeals for the Federal Circuit, stand for the proposition that even if an accused device *read on* the literal language of the claim, it may be so far changed in principal from the original device that a finding of infringement could not equitably lie.

[8] Rich, J., Address before the New York Patent Law Association (November 6, 1952), reprinted in R. Calvert, The Encyclopedia of Patent Practice and Invention Management 17, "Section 112 --

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In order to meet a *means-plus-function* limitation literally, an accused device must (1) perform the *identical* function claimed for the means element, and (2) perform that function using the structure disclosed in the specification or an *equivalent* structure. Intel Corp. v. U. S. Int'l Trade Comm'n, 946 F.2d 821, 20 U.S.P.Q.2D (BNA) 1161 (Fed. Cir. 1991); Pennwalt, 833 F.2d at 934, 4 U.S.P.Q.2d at 1739; see also Laitram Corp., 939 F.2d 1533, 19 U.S.P.Q.2D at 1369-70; Durango Assocs., Inc. v. Reflange, Inc., 843 F.2d 1349, 1357, 6 U.S.P.Q.2D (BNA) 1290, 1295 (Fed. Cir. 1988). In short, identity of function, equivalents of structure.

If the required function is not performed **exactly** in the accused device, § 112, paragraph 6 is not involved. See, e.g., Intel Corp., 946 F.2d 821, 20 U.S.P.Q.2D (BNA) 1161.

The interpretation of a § 112, paragraph 6 claim may not be performed absent a detailed look at the specification. First, the structure or structures disclosed in the specification, which carry out the stated function, must be identified. Next, the accused device is reviewed to determine which, if any, structures carry out the stated function[9]. Only after the accused structure

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Means Claims" (1964).

[9] Note that the law imposes no requirement that there be a one to one correspondence between structures in the accused device and elements in the claim. It is possible that the accused

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and the disclosed structure are identified, can the court determine whether these structures are equivalent -- and if so, that the element is literally present in the accused device.

In other words, if the accused device carries out the identical function as the one disclosed in the claim element, using a structure equivalent to one disclosed in the specification for carrying out the function described in the claim element, then the claim element is literally present in the accused device. And, where all claim elements are literally present, literal infringement is found. Where a claim comprising *means-plus-function* elements is compared to an accused device, and the element is found not to be present, then either: (i) the accused device does not perform the *identical* function; or alternately, (ii) the accused device, in fact, performs the *identical* function, but does not use an *equivalent* in so doing.

As an example, assume that a claims elements comprise A, B, and a means for X; and the specification only discloses C as the structure to carry out the function X. Further, assume the accused device comprises A, B, and a means for X; but the structure which carries out X is D. Then the proper inquiry, as to whether there is literal infringement, is simply whether C is

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device have a single structure which carries out many functions recited in the claim. Conversely, it is possible that a multiplicity of structures in the accused device, together, to carry out a single recited function.

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equivalent to D -- if so, literal infringement can be found; if not there can be no finding of literal infringement.

Of course, rarely is the a matter as clearly framed as the above example. Often, multiple *means-plus-function* elements differ from the claimed invention to the accused device. When that is the case, as the court in Texas Instruments, Inc. v. United States Int'l Trade Comm'n, 805 F.2d 1558, 231 U.S.P.Q. (BNA) 833, so aptly noted, the equivalency of each changed means is appropriately determined in light of the other structural changes in the combination. To evaluate each changed means as if it were the only change in the accused device would distort the process and evaluate a theoretical device made up of all but one of the patentee's disclosed structure. That is not the standard. Of course, the court provided no guidance as to how it was able to apply this unwieldy standard and determine each change in light of all of the others. Instead, the court merely summarized the changes, and then stated: "[t]aken together, these accumulated differences distinguish the accused [devices] from that contemplated in the [] patent and transcend a fair range of equivalents of the [] invention." Texas Instruments, Inc., 805 F.2d at 1570, 231 U.S.P.Q. (BNA) 833.

Simply put, a *means-plus-function* element is literally infringed if there is identity of function and equivalents of structure.

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3. Method Claims and Statutory Equivalents

It is worth mention that § 112, paragraph 6 reads on combination method claims as well as on apparatus claims. Of course, the above discussion related almost exclusively to apparatus claims because there is no case law applying § 112, paragraph 6 to method claims. However, the statute expressly states that a claim may be expressed as a:

> step for performing a specified function without the recital of ... acts in support thereof, and ... shall be construed to cover the corresponding ... acts described in the specification and equivalents thereof.

35 U.S.C. § 112, paragraph 6

It is hard to imagine that method claims generally recite sufficient acts within each element so that they would not be subject to a § 112, paragraph 6 interpretation. Yet in my review of case law, I have not found § 112, paragraph 6 applied to method claims.

What is most surprising is that many claim drafters, artisans in their own right, write parallel claims, in both apparatus and method form to cover the same invention in varying ways. Consider the following:

> An apparatus comprising:
> means for X;
> means for Y; and
> means for Z.

The means of this claim are limited to the structures (and their statutory equivalents) disclosed in the specification for carrying out the functions X, Y and Z. Were the application

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being written with a parallel claim in method form, it would probably look like this:

A method comprising the steps of:
X'ing;
Y'ing; and
Z'ing.

The scope of these latter claims could differ significantly, if they were not restricted in interpretation by § 112, paragraph 6, the method claim could have considerably larger scope than its *means-plus-function* counterpart. Although the statute does seem to provide that this claim is to be limited only to the disclosed acts for carrying out the step and statutory equivalents, the reported cases do not seem to support this.

4. *Determining Statutory Equivalents*

Up to this point the focus has been upon determining the *"what"* to compare for *statutory equivalents* in an element written in *means-plus-function* form according to § 112, paragraph 6. Of course, once "what" to compare has been determined, we must decide whether the element in the accused device is the *statutory equivalent* of that which is disclosed in the specification. It is here, where the case law seems to have no clear cut guidance.

(a) *Texas Instruments . v. United States Int'l Trade Comm'n*

In Texas Instruments, Inc., 805 F.2d 1558, 231 U.S.P.Q. (BNA) 833 there was no question as to whether the accused devices performed the function stated in the claims. Texas Instruments at 1568. At issue, inter alia, was a display means. In the patent only a thermal printer was disclosed, but the accused

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devices all used an LCD display. The ALJ construed the scope of the claim to be limited to a thermal printer. After the ALJ made a concise description of an LCD, finding, for instance, that it "consists of two sheets between which is sealed a liquid crystalline material ...", Texas Instruments, Inc., 805 F.2d at 1567 231 U.S.P.Q. (BNA) 833, he determined that the LCD's of the accused device are not the same as, or equivalent to a thermal printer. The Court of Appeals for the Federal Circuit concluded that the ALJ interpreted the claims too narrowly when he limited each means to the embodiment shown in the specification.

In their own analysis the Court stumbled over the language of the tripartite test from Graver Tank, and referred to it as no more than a way to state the problem. The Court pointed out that the scope of a claim under § 112, paragraph 6 is a legal determination, but it is not without equitable considerations. Specifically, on the topic of equivalents in § 112, paragraph 6, the Court cited Graver Tank, not for the tripartite test, but for the proposition that:

> Equivalence, in the patent law, is not the prisoner of a formula and is not an absolute to be considered in a vacuum. It does not require complete identity for every purpose and in every respect ... . Consideration must be given to the purpose for which an ingredient is used ... and the function which it is intended to perform.

339 U.S. at 609. Thus unequivocally condoning the use of the traditional considerations for equivalents in a *statutory equivalents* test. Of course there is not much guidance in the

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Graver Tank dicta cited above, however, it allows a hundred years of law on equivalents to be read into the meaning of the word equivalents in 35 U.S.C. § 112, paragraph 6.

On rehearing, the concurring opinion of Davis, J., most aptly noted the "symbiosis" between § 112 "equivalents" and the doctrine of equivalents -- "both spring from the same roots and very often take account of the same factors and considerations."

A rehearing en banc was denied.

While stressing the distinctiveness of each of the separate doctrines, the Court of Appeals for the Federal Circuit, in Palumbo v. Don-Joy Co., 762 F.2d 969, 975 n.4, 226 U.S.P.Q. 5, 8-9 n.4 (Fed. Cir. 1985) declared that Graver Tank concepts of equivalents are relevant in any 'equivalents' determination under § 112, and the underlying principals of equivalents in Graver Tank could be used in a § 112 literal infringement, e.g. *statutory equivalents*, analysis. See also Lockheed Aircraft Corp. v. United States, 553 F.2d 69, 193 U.S.P.Q. (BNA) 449 (Ct.Cl. 1977).

(b) *Valmont Industries Inc. v. Reinke Manufacturing Co., Inc.*

To determine whether a particular structure for carrying out the claimed function is *a statutory equivalent* (e.g. the § 112, paragraph 6 sense) the courts have turned to the familiar tripartite test, and/or used the tradition notion of equivalents, both with over one hundred years of case law behind it. The three judge panel in Valmont Industries Inc. v. Reinke

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Manufacturing Co., Inc., __ F.2d __, __ U.S.P.Q.2d (BNA) ___, CA FC Nos. 1377 and 1378, 1/7/93 (Fed. Cir. 1993), however, was content to disregard this.

The Valmont Court finds that § 112 and the doctrine of equivalents have one thing in common, the word equivalent. While demonstrating a clear understanding of the § 112, paragraph 6 analysis, the Court, lead by an apparently confused Raider, J., states: "[a] determination of section 112 equivalents does not involve the equitable tripartite test of the doctrine of equivalents." Although the Court purports to be clear on what *statutory equivalents* is not, it provides no guidance for what it is, except: "comparison of these two control means compels the conclusion that the claimed control means and [defendant's] control means are not structurally equivalent under section 112." Despite itself, the Valmont Court reached the proper result.

The ramifications of this decisions should be mitigated by the fact that it was merely a three judge panel. Although it is doubtless that, until overruled, it will be cited, maybe for years to come, for the proposition that statutory equivalents is not even a distant cousin of the doctrine of similar ilk.

VI. Equivalents, Equivalents or Equivalents.

There are a few things which are troublesome about the equivalents problems. First, the courts have managed to build reasoning upon itself. Take, for example, the following logic. To prove that an accused device infringes a claim under the

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doctrine of equivalents, a patentee can prove: that the accused device performs substantially the same function, in substantially the same way, to achieve substantially the same result.

But how do we know when these are substantially equivalent?

That's easy, the courts have provided guidance. We can look to the function which it is intended to perform; or the qualities it has when combined with the ingredients.

Specifically, the courts have relied on whether there was a known interchangeability to determine whether the way prong is met.

This would suffice, but for the courts statement in Corning that:

> Although each claim limitation may not literally be found in the accused structure, the 'substantially the same way' prong of the Graver Tank test is met if an **equivalent** of a recited limitation has been substituted in the accused device, see Graver Tank, 339 U.S. at 610; see also, Pennwalt Corp. v. Durand-Wayland, Inc., 833 F.2d 931, 937, 4 U.S.P.Q.2d 1737, 1741 (Fed. Cir. 1987) (in banc) cert. den. 485 U.S. 961 (1988); Perkin-Elmer Corp., 882 F.2d at 1533, 3 U.S.P.Q.2d at 1325; Atlas Powder Co. v. E.I. Du Pont de Nemours & Co., 750 F.2d 1569, 1579-80, 224 U.S.P.Q. 409, 416 (Fed. Cir. 1984).

Corning Glass Works, 868 F.2d at 1259, 9 U.S.P.Q.2d (BNA) 1962. Thus using the concept of equivalents to meet the way prong of the test to meet the test of the doctrine of equivalents. Could one then determine that the recited limitation were an equivalent by using the tripartite test?

This is merely an example of the frailty of language.

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Notwithstanding the obvious shortcomings of attempting to define inventions -- and for that matter trying to define equivalents -- with mere language, a substantial question arises from this research. That is: if a proper § 112, paragraph 6 analysis has been performed on an element of a claim, and that element, and therefore literal infringement has been found not to exist, then, can that device ever be found to infringe under the doctrine of equivalents, in light of the all elements rule?

That requires some further detailed analysis. First, assume that there is a claim for a combination wherein all of the elements but one are admitted to exist in the accused device. Then assume that the element not admitted is written in *means-plus-function* form. Further, assume that after a proper analysis under § 112, paragraph 6, this element is found not to literally exist in the accused device because the structures which carries out the function is not identical, nor equivalent to those structures disclosed in the specification (structural non-equivalents). Can the element still have a substantial equivalent in the accused device?

Although equivalents in any usage is ill-defined, in the case (above) of structural non-equivalents, the answer must be a clearly resounding no. Thus, a finding that the structure (or its equivalent) of a *means-plus-function* claim element is not present in an accused device should preclude any inquiry under the doctrine of equivalents. This results because if the

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equivalent of the structure is not present, then the substantial equivalent of the limitation cannot be. Further, no cases which have reached the Federal Circuit have had findings contrary to this conclusion[10].

Consider a similar scenario, where the only element not admitted to exist in the accused device is in *means-plus-function* form. This time the § 112, paragraph 6 analysis finds that the accused device does not carry out the identical function (functional non-identity). Can the element still have a substantial equivalent in the accused device?

Although the courts make a big *to do* about the requirement that the function be identical, this seems to miss the point entirely. A function is either carried out, or it is not.

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[10] Sun Studs, Inc. v. ATA Equipment Leasing, Inc., 872 F.2d 978, 10 U.S.P.Q.2d (BNA) 1338 (Fed. Cir. 1989), under less than ordinary circumstances, was remanded to consider the doctrine of equivalents without a concurrent reversal of the finding of no literal infringement on § 112, paragraph 6 elements. There was a jury finding of literal infringement, and in the alternative, infringement under the doctrine of equivalents. The trial judge granted the defendants motion for a judgment n.o.v. and ruled that there was no infringement. It is notable, however, that the plaintiff did not press the issue of literal infringement, and thus the courts review and therefore its remand, was limited to the doctrine of equivalents.

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Unlike structure, functions are not subject to so many interpretations. Either there is, for instance "means for displaying" or not; the question is not directed to what carries out the display function, only whether it is carried out. Thus, it is a proper conclusion that infringement under the doctrine of equivalents cannot be found where functional non-identity of a *means-plus-function* claim element exists.

VII. Conclusion

The Court has admonished that analysis under the doctrine of equivalents is not a necessary step in every infringement analysis. The Court, however, has never been able to delineate a single genre of case wherein the doctrine is not properly argued. This research provides an articulable standard that provides the Federal Circuit with a means to do away with the doctrine of equivalents analysis where literal infringement of a *means-plus-function* element is not found.

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