

# Expanding the Use of Hypothetical Analysis When Evaluating Patent Infringement Under the Doctrine of Equivalents

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## I. INTRODUCTION

A patent is a grant to exclude others from making, using, or selling a claimed invention without the patent holder's permission.<sup>1</sup> The patent holder has the right to bring a civil action when she believes her patent has been infringed.<sup>2</sup> Defining the limits of a patent holder's right to exclude others from making, using, or selling the patented invention, however, has proved to be a formidable task. Early in American patent history, an equitable doctrine was established to provide a patent holder with a remedy against items that were practically, but not quite exactly, identical to the claimed invention.<sup>3</sup> This has become known as the doctrine of equivalents. The doctrine of equivalents method evaluates whether an item infringes on a patent when it is not precisely covered by the express language of the patent but is substantially the same.

The equitable nature underlying the doctrine of equivalents can be illustrated by a simple example. Imagine a world without paper clips of any sort. One day our hero, John Clip, while idly sitting at his desk, wraps a short length of wire around an eraser. The wire eventually drops from the eraser next to a stack of paper catching several pages together and Eureka! the paper clip is invented. Mr. Clip's patent claim reads: "I claim—A non-invasive paper fastening device comprising a piece of metal wire having three 180 U-bends, said bends all lying in a single geometric plane."

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1. 35 U.S.C. § 271(a) (1988).

2. *Id.* § 281.

3. *See, e.g.*, *Winans v. Denmead*, 56 U.S. (15 How.) 330 (1854); *Park v. Little*, 18 F. Cas. 1107 (C.C.D. Pa. 1813) (No. 10,715); *Odiorne v. Winkley*, 18 F. Cas. 581 (C.C.D. Mass. 1814) (No. 10,432).

Much to his distress, Mr. Clip's financial success from the paper clip is undermined by Ms. Shiphty who, appreciating the commercial potential of the paper clip, sets out to manufacture an imitation that just avoids the patent claim language. She flanges the ends of the paper clip outward slightly, thus avoiding the "one plane" limitation of the patent. Mr. Clip cannot argue that Ms. Shiphty's device is exactly what he claimed because, in patent parlance, her device does not "read on" his patent.<sup>4</sup> Mr. Clip's right to exclude is so narrow that he will lose the benefit of his invention because Ms. Shiphty marginally circumvents the patent claim's express language. The doctrine of equivalents attempts to avoid such abuse of patent rights.<sup>5</sup>

Despite the obvious inequities involved in this example, the edges of the doctrine of equivalents are defined by closer cases, and the doctrine is frequently clarified by the Federal Circuit.<sup>6</sup> Among the more recent decisions attempting to clarify application of the doctrine of equivalents is *Wilson Sporting Goods v. David Geoffrey & Assocs.*<sup>7</sup> *Wilson* proposed that a court evaluating infringement under the doctrine of equivalents should conceive a hypothetical version of the patent at issue, which expands the patent claim enough so that the allegedly infringing device reads on the patent claim.<sup>8</sup> If this expanded version of the claim would also cover prior art,<sup>9</sup>

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4. A device is said to "read on" a patent if every element in the patent is present in the device. A device that reads on a patent is said to literally infringe a patent. *Jurgens v. McKasy*, 927 F.2d 1552, 1560 (Fed. Cir.), *cert. denied*, 112 S. Ct. 281 (1991).

5. See, e.g., *Slimfold Mfg. Co. v. Kinkead Indus.*, 932 F.2d 1453, 1457 (Fed. Cir. 1991) ("It is only when the changes are so insubstantial as to result in 'a fraud on the patent' that application of the equitable doctrine of equivalents becomes desirable."). See also REPORT OF THE PRESIDENT'S COMMISSION ON THE PATENT SYSTEM, TO PROMOTE THE PROGRESS OF USEFUL ARTS IN AN AGE OF EXPLODING TECHNOLOGY 1-3 (1966) (stating that the patent system encourages expenditures of time and private risk capital in research and development and encourages early public disclosure of technological information).

6. The Court of Appeals for the Federal Circuit is the thirteenth court of appeals and was created by the Federal Courts Improvement Act of 1982, Priv. L. No. 97-164, 96 Stat. 25 (1982). The Federal Circuit's jurisdiction is determined by subject matter rather than by region and includes patent cases. 28 U.S.C.A. § 195(a) (1988). Congress formed the Federal Circuit mainly to unify judicial standards in patent cases.

7. 904 F.2d 677 (Fed. Cir. 1990), *cert. denied*, 112 S. Ct. 281 (1991).

8. *Id.* at 684.

9. "Prior art" is a term of art that would probably be better understood today if one thought of it as meaning "existing technology." One of the basic conditions for patentability is that a person may not patent an item that would be obvious to someone who is an expert in the field after that person considered existing technology. 35 U.S.C. § 103 (1988). Prior art includes the relevant teachings and technologies that the

the doctrine of equivalents would be stretched too far to find infringement. This hypothetical technique for evaluating the effect of prior art on any doctrine of equivalents infringement has been useful,<sup>10</sup> but the hypothetical could be even more useful.

Accordingly, the purpose of this Comment is twofold: first, to bring the reader up-to-date on the doctrine of equivalents, and second, to suggest an improvement on the doctrine's application that is consistent with recent developments. This Comment proposes that the hypothetical technique should be expanded to evaluate more than prior art alone. Before exploring how this new use of the hypothetical would work, however, it is necessary to explain the doctrine of equivalents' history, the factors that affect the range of equivalents, and the methods to determine and apply equivalents.

## II. ORIGIN OF THE DOCTRINE OF EQUIVALENTS

The doctrine of equivalents appeared in the United States over one hundred years ago,<sup>11</sup> and the United States Supreme Court first applied the doctrine in *Winans v. Denmead*.<sup>12</sup> In that case, the Court held that the infringer's octagonal-shaped coal car was equivalent to the patented cone-shaped coal car because it performed the same novel functions as the patented car even though it did not literally infringe on the patent claims.<sup>13</sup> The dissent in *Winans*, however, feared that to allow a finding of infringement where the allegedly infringing item does not read on the patent, but misappropriates the underlying idea, would be to cause judicial unpredictability.<sup>14</sup>

While *Winans* marked the Court's legitimization of the

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patent office could look to rejecting a patent application for lack of novelty or obviousness. See *Hazeltin Research, Inc. v. Brenner*, 382 U.S. 252 (1965).

10. See, e.g., *Jurgens v. McKasy*, 927 F.2d 1552, 1561 (Fed. Cir. 1991), cert. denied, 112 S. Ct. 281 (1992); *Key Mfg. v. Microdot*, 925 F.2d 1444, 1449 (Fed. Cir. 1991). But see *International Visual Corp. v. Crown Metal Mfg.*, 1993 U.S. APP. LEXIS 8017, \*8 (Fed. Cir. 1993) (rejecting a trial court's misapplication of the hypothetical method).

11. See *Park v. Little*, 18 F. Cas. 1107 (C.C.D. Pa. 1813) (No. 10,715); *Odiorne v. Winkley*, 18 F. Cas. 581 (C.C.D. Mass. 1814) (No. 10,432).

12. 56 U.S. (15 How.) 330 (1854).

13. *Id.* at 341, 344.

14. *Id.* at 347 (Campbell, J., dissenting) ("Nothing, in the administration of this law, will be more mischievous, more productive of oppressive and costly litigation, of exorbitant and unjust pretensions and vexatious demands, more injurious to labor, than a relaxation of these wise and salutary requisitions of the act of Congress.").

doctrine of equivalents, the Court's most noted application of the doctrine was in *Graver Tank & Manufacturing v. Linde Air Products Co.*<sup>15</sup> In that case, the Court evaluated the alleged infringement of a patent for a welding flux.<sup>16</sup> The patent at issue claimed a combination of materials including magnesium. The allegedly infringing welding flux was identical to the patented flux except that manganese was used in place of magnesium.<sup>17</sup> The Court held that the patent was infringed because persons skilled in the art would know that manganese was equivalent to and could be substituted for magnesium.<sup>18</sup> *Graver Tank* is noteworthy because, in coming to its decision, the Court set out an evaluation standard that has become the essence of every doctrine of equivalents analysis and because it provided a precedent for seeking to satisfy the equitable policy underlying the doctrine. That standard provides: "[A] patentee may invoke [the doctrine of equivalents] against the producer of a device *if it performs substantially the same function in substantially the same way to obtain the same result.*"<sup>19</sup>

The policy set out in *Graver Tank* underlies much of the subsequent evolution of the doctrine of equivalents. The Court recognized that the doctrine's equitable nature would prevent the application of any brightline rule.<sup>20</sup> Therefore, the Court relied on policy, stating that the doctrine is necessary "to tem-

15. 339 U.S. 605 (1950).

16. *Id.* at 606.

17. *Id.* at 610. The patent claimed a welding flux containing alkaline earth metal silicate and calcium fluoride. The Court noted, however, that the patent owner's actual product contained only silicates of calcium and magnesium, which are both alkaline earth metals. The infringer's flux contained silicates of calcium and manganese, which are not an alkaline earth metal.

18. *Id.* at 612. The Court bolstered its conclusion by noting that the infringer failed to make any showing that its product was developed by independent research rather than mere imitation. *Id.* at 611. The Court here uses the term "skilled in the art" as a term of art, referring to persons who are knowledgeable about the subject matter of the patent at issue.

19. *Id.* at 608 (emphasis added) (citing *Sanitary Refrigerator Co. v. Winters*, 280 U.S. 30, 42 (1929)). While the emphasized language was actually quoted from *Sanitary Refrigerator Co.*, subsequent references to this language almost always cite only *Graver Tank*. See, e.g., *Valmont Indus. v. Reinke Mfg. Co.*, 983 F.2d 1039, 1043 n.3 (Fed. Cir. 1993); *Read Corp. v. Portec Inc.*, 970 F.2d 816, 822 (Fed. Cir. 1992); *Intel Corp. v. United States Int'l Trade Comm'n*, 946 F.2d 821, 832 (Fed. Cir. 1991); *Malta v. Schulmerich Carillons, Inc.*, 952 F.2d 1320, 1324 (Fed. Cir.), *cert. denied*, 112 S. Ct. 2942 (1991); *Dixie USA, Inc. v. Infab Corp.*, 927 F.2d 584, 587 (Fed. Cir.), *cert. denied*, 112 S. Ct. 281 (1991).

20. *Graver Tank*, 339 U.S. at 609. ("Equivalence, in the patent law, is not the prisoner of a formula and is not an absolute to be considered in a vacuum.").

per unsparing logic and prevent an infringer from stealing the benefit of an invention."<sup>21</sup> Similarly, the Court added that "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."<sup>22</sup>

*Graver Tank*, however, was not a unanimous decision. Two justices found the policy against allowing use of the doctrine of equivalents more persuasive. Justice Douglas argued that the majority used the doctrine of equivalents to expand the original patent to a welding flux that would have been made obvious and thus unpatentable by the prior art.<sup>23</sup> Justice Black argued that *Graver Tank* was an improper place for applying the doctrine of equivalents because: (1) the patentee was seeking broader protection than claimed in his patent, and (2) the majority's holding failed to "protect[] businessmen from retroactive infringement suits and judicial expansion of a monopoly sphere beyond that which a patent expressly authorizes."<sup>24</sup>

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21. *Id.* at 608 (citing *Royal Typewriter Co. v. Remington Rand*, 168 F.2d 691, 692 (1948)).

22. *Id.* at 607.

23. *Id.* at 618 (Douglas, J., dissenting) (stating that the majority had used "a doctrine which is said to protect against practicing 'a fraud on a patent' . . . to extend a patent to a composition which could not be patented").

24. *Id.* at 615 (Black, J., dissenting).

Justice Black's second point addresses the concern that the doctrine of equivalents may expand patent rights. One might erroneously argue that to provide a patentee with anything the patentee did not specifically patent is to expand the patent claim. On this point, the Federal Circuit has noted that "[t]o say that the doctrine of equivalents extends or enlarges the claims is a contradiction in terms. The claims—i.e., the scope of patent protection as defined by the claims—remain the same and application of the doctrine expands the right to exclude to 'equivalents' of what is claimed." *Wilson Sporting Goods v. David Geoffrey & Assoc.*, 904 F.2d 677, 684 (Fed. Cir.), *cert. denied*, 111 S. Ct. 537 (1990) (emphasis omitted). This is because "[t]he language and thus the breadth, of the claims never changes." *We Care, Inc. v. Ultra-Mark Int'l*, 930 F.2d 1567, 1571 n.3 (Fed. Cir. 1991). "[T]he purpose is to ensure that the patent holder does not obtain a *broader* right to exclude under that doctrine than could have been obtained from the patent office." *Intel Corp. v. United States Int'l Trade Comm'n*, 946 F.2d 821, 842 (Fed. Cir. 1991) (emphasis in original).

However, the court in *Insta-foam Products v. Universal Foam Systems*, 906 F.2d 698 (Fed. Cir. 1991), implied that a patentee's rights are extended under the doctrine of equivalents, but in a limited manner. "The doctrine of equivalents cannot, of course, be used by a patentee to *extend* the right to exclude others *so broadly* as to ensure subject matter within the public domain." *Id.* at 704 (emphasis added). *Insta-Foam* thus implies that some extension of the patentee's rights beyond what was claimed is possible so long as it does not extend to the public domain.

The court in *Kinzenbaw v. Deere & Co.*, 741 F.2d 383 (Fed. Cir.), *cert. denied*, 470 U.S. 1004 (1984), also implied that the doctrine of equivalents expands a patent. "[The patentee] has not given any convincing reason why we should enlarge the literal scope

In spite of such arguments, both *Winans* and *Graver Tank* used the doctrine of equivalents to achieve results that would give patent protection meaningful breadth. The Court's primary objective in each case was to encourage inventions by discouraging narrow avoidance of a patent's language.<sup>25</sup>

### III. LIMITATIONS ON THE PERMISSIBLE RANGE OF EQUIVALENTS

Four sources of information limit the range of equivalents that a patentee may be allowed to obtain: the patent, the prosecution history of the patent,<sup>26</sup> the prior art related to the patent, and the degree to which the invention is of a pioneering nature.<sup>27</sup>

#### A. *The Patent and Prosecution History*

A court should begin an infringement analysis by looking at the face of the patent.<sup>28</sup> The patent claim defines the literal limits of what the patent holder may exclude others from making, using, or selling. Claim construction is a matter of law for the court to decide.<sup>29</sup> A patent also has a specification that describes the invention and methods for making it and using it. The patent specification is secondary to the claim, and while it may help a court understand what is claimed, it cannot be the

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of the . . . patent claims. Such enlargement would be particularly inappropriate here, where we deal with 'improvement patents in a crowded art.' " *Id.* at 389 (citing *Hughes Aircraft Co. v. United States*, 717 F.2d 1351, 1362 (Fed. Cir. 1983)). The *Kinzenbaw* court implied that enlargement is possible under some conditions other than those in the case at bar.

25. *See, e.g., Graver Tank*, 339 U.S. at 607-08.

26. One court described prosecution history as follows: "[W]hen a patentee, during the prosecution of his application, adds a limitation . . . in response to a rejection based on prior art references . . . in an effort to overcome that rejection, the patentee cannot later successfully argue that an accused device that lacks the . . . limitation infringes the patent." *Dixie USA, Inc. v. Infab Corp.*, 927 F.2d 584, 587-88 (Fed. Cir. 1991).

27. *See, e.g., Intel Corp. v. United States Int'l Trade Comm'n*, 946 F.2d 821, 842 (Fed. Cir. 1991).

28. *See, e.g., Minnesota Mining and Mfg. Co., v. Johnson & Johnson Orthopaedics, Inc.*, 976 F.2d 1559, 1565 (Fed. Cir. 1992) ("To review the district court's finding [of infringement under the doctrine of equivalents], we first have to construe the claims.") (citing *Kalman v. Kimberly-Clark Corp.*, 713 F.2d 760, 771 (Fed. Cir. 1983), *cert. denied*, 465 U.S. 1026 (1984)).

29. *Id.* ("Claim construction is a question of law. However, when the meaning of key terms of the claim is disputed, as in this case, and extrinsic evidence is necessary to explain the terms, then underlying factual questions may arise.") (citing *Johnson v. IVAC Corp.*, 885 F.2d 1574, 1579 (Fed. Cir. 1989)).

basis for limiting the range of equivalents.<sup>30</sup> The patent claim and patent specification work together to define the maximum range of equivalents. Only after a court interprets the patent, concludes that no literal infringement exists, and determines that finding the patent not infringed may be unfair to the patentee, may the court evaluate the patent under the doctrine of equivalents.<sup>31</sup>

Under this doctrine, a court should first look to the patent's prosecution history.<sup>32</sup> Prosecution history is the history of a patent's evolution from the first version of the patent submitted to the Patent and Trademark Office (PTO) to the patent as issued.<sup>33</sup> Where the patentee has made concessions to the patent examiner in the way of restrictions in language of claims to obtain the patent, these concessions or restrictions may be used to limit the patentee.<sup>34</sup> In particular, in a subsequent infringement action, the patentee is prevented or estopped from asserting claim interpretations that encompass the conceded claim limitations against the alleged infringer.<sup>35</sup> This is known as prosecution history estoppel.

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30. While the specification may assist the court, it may not serve as the basis for defining the invention's patentability. As stated in one case: "[T]his court has repeatedly held that it is the claims which define the invention. The district court therefore erred in comparing the[ ] specification figures with the prior art to determine the patentability of the invention." *Uniroyal v. Rudkin-Wiley*, 837 F.2d 1044, 1053 (Fed. Cir.), *cert. denied*, 488 U.S. 825 (1988) (citing *Loctite Corp. v. Ultraseal Ltd.*, 781 F.2d 861, 870 (Fed. Cir. 1985)).

31. See *Wallace London and Clemco Prods., Inc. v. Carson Pirie Scott & Co.*, 946 F.2d 1534 (Fed. Cir. 1991). The court in this case stated:

Application 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 fail to serve their intended purpose. Competitors will never know whether their actions infringe a granted patent.

*Id.* at 1538.

32. See *We Care, Inc. v. Ultra-Mark Int'l Corp.*, 930 F.2d 1567, 1570 (Fed. Cir. 1991) (stating that "equivalency is determined in light of prior art, the patent specification, and the prosecution history").

33. See generally 4 DONALD S. CHISUM, PATENTS § 18.02[3] (1991) (describing prosecution history and its application under the doctrine of prosecution history).

34. See *Hormone Research Found., Inc. v. Genemtech, Inc.*, 904 F.2d 1558 (Fed. Cir. 1990). In *Genemtech*, the court stated that "[p]rosecution history estoppel is a judicially accepted limitation to the doctrine of equivalents. Under that limitation, a patentee cannot recapture through equivalence certain coverage given up by argument or amendment during prosecution." *Id.* at 1564 (citation omitted).

35. *Dixie USA, Inc. v. Infab Corp.*, 927 F.2d 584 (Fed. Cir. 1991). See also quote *supra* note 26.

Prosecution history, like prior art, helps define the periphery of patent protection against infringement; both are often used to defend against infringement under the doctrine of equivalents.<sup>36</sup> While prosecution history estoppel may limit the range of infringement actions that a patent owner can successfully bring, it is possible for a prospective patentee to limit its effect.

The Federal Circuit in *Insta-Foam Products v. Universal Foam Systems*<sup>37</sup> addressed a situation where prosecution history estoppel failed to prevent a patentee from recovering for infringement under the doctrine of equivalents. The court in *Insta-Foam* considered whether Universal's foam gun dispensing mechanism infringed on Insta-Foam's patent claim.<sup>38</sup> After finding that Universal's gun performed substantially the same function in substantially the same way to obtain substantially the same result as Insta-Foam's gun, the court considered whether the prosecution history limited the range of equivalents that Insta-Foam could claim.<sup>39</sup>

Although Insta-Foam's patent application had initially been rejected by the patent examiner, Insta-Foam avoided the prosecution history by not commenting on the merits of the patent examiner's rejection, but simply by redrafting around the objection without making any specific concessions.<sup>40</sup> The court thus concluded that Insta-Foam's invention was not limited by the prosecution history and that Universal had infringed on Insta-Foam's patent. Insta-Foam was able to elim-

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36. See *Hormone Research Found., Inc. v. Genentech, Inc.*, 904 F.2d 1558 (Fed. Cir. 1990). In *Genentech*, the court stated:

Prosecution history estoppel is a judicially accepted limitation to the doctrine of equivalents. Under that limitation, a patentee cannot "recapture through equivalents certain coverage given up [by argument or amendment] during prosecution." That is not to say, however, that, whenever a limiting amendment or argument is made during prosecution, the patentee loses all coverage between what the claims literally cover and what they would have covered prior to the amendment or argument.

*Id.* at 1564 (citations omitted).

37. 906 F.2d 698, 703 (Fed. Cir. 1990).

38. Insta-Foam's patent described a foam dispensing gun consisting of three relevant elements: a trigger, a plunger, and a ball. Insta-Foam's trigger and plunger were integrated into a single part. Universal's allegedly infringing dispenser had instead integrated the plunger and ball into a single part. However, both used all three parts, the trigger, plunger, and ball, moving together to effect the same result. *Id.* at 700.

39. *Id.* at 702-03.

40. *Id.* at 703.



inate any potential effect of the prosecution history's limitations on the range of equivalents. The court held as follows:

Whenever prosecution history estoppel is invoked as a limitation to infringement under the doctrine of equivalents, a close examination must be made as to, not only what was surrendered, but also the reason for such a surrender. Amendments may be of different types and may serve different functions. Depending on its nature and purpose, an amendment may have a limiting effect within a spectrum ranging from great to small to zero.<sup>41</sup>

While the patent claim and the prosecution history form the preliminary framework for defining the range of equivalents, the range of equivalents may also be limited by prior art.

### B. The Prior Art

After considering the patent claim and the prosecution history to define a patent's potential range of equivalents, a court must consider whether the prior art<sup>42</sup> further narrows a patent's range of equivalents.

[A] patentee should not be able to obtain, under the doctrine of equivalents, coverage which he could not lawfully have obtained from the PTO by literal claims. The doctrine of equivalents exists to prevent a fraud on a patent, not to give a patentee something which he could not lawfully have obtained from the PTO had he tried. Thus, since the prior art always limits what an inventor could have claimed, it limits the range of permissible equivalents of a claim.<sup>43</sup>

In *Wilson Sporting Goods v. David Geoffrey & Assocs.*,<sup>44</sup> the court had to decide whether an icosahedral<sup>45</sup> dimple pattern on Dunlop's golf balls infringed on Wilson's golf ball dim-

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41. *Id.* (citations omitted).

42. See *supra* note 9 and accompanying text.

43. *We Care, Inc. v. Ultra-Mark Int'l Corp.*, 930 F.2d 1567, 1570-1571 (Fed. Cir. 1991) (citing *Wilson Sporting Goods v. David Geoffrey & Assocs.*, 904 F.2d 677, 684 (Fed. Cir.), *cert. denied*, 111 S. Ct. 537 (1990)). See also *Slimfold Mfg. Co. v. Kinkead Indus., Inc.*, 932 F.2d 1453, 1457 (Fed. Cir. 1991) ("[W]e note that the claimed invention is a mechanical combination in a crowded field. . . . Such an invention is entitled only to a narrow scope of equivalents.").

44. 904 F.2d 677 (Fed. Cir.), *cert. denied*, 111 S. Ct. 537 (1990).

45. Icosahedral is a pattern formed on a sphere by placing five equilateral triangles at the pole of the sphere. The area from the bottom of these triangles to the equator of the sphere is covered by ten additional equilateral triangles and the other hemisphere has an identical pattern. The four belts created by these triangles are nested such that every point of a triangle touches four other triangles. This pattern

ple pattern.<sup>46</sup> The basic pattern was not new and had been patented as far back as 1932.<sup>47</sup> The court used a completely new technique to evaluate whether the Dunlop ball infringed on the Wilson patent. The court suggested that a helpful tool is to conceptualize a hypothetical patent claim that would literally cover the accused product.<sup>48</sup> If the hypothetical claim could have been allowed by the PTO over the prior art, then the accused product infringes on the patent.<sup>49</sup> Again, the patentee has the burden of proving that the equivalent it seeks would not ensnare the prior art.<sup>50</sup>

After comparing the patent, the allegedly infringing item, and the prior art, the court found that there was "simply 'no principled difference' between the hypothetical claim and the prior art."<sup>51</sup> This commonality with the prior art prevented Wilson from successfully asserting that Dunlop had infringed its patent.

Rather than clarifying the doctrine of equivalents, *Wilson* left the intellectual property community with a masterfully tied Gordian knot with no apparent Alexander the Great available to cleave the problem for a quick solution.<sup>52</sup> However, Judge Rich helped resolve some of the confusion that followed from his *Wilson* opinion in *Jurgens v. McKasy*.<sup>53</sup> In *Jurgens*, Judge Rich stated the following: "We have recently noted that it may be helpful to 'conceptualize' the prior art limitations on the doctrine of equivalents by envisioning a hypothetical pat-

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creates six skew planes each precisely dividing the golf ball in half around a separate plane of symmetry.

46. *Wilson*, 904 F.2d at 678-79. The Wilson patent was unique in that it defined the golf balls dimples as not overlapping the icosahedral great circles at all. *Id.* at 680. Other prior art included a patent by Uniroyal in which the dimples intersected the great circle pattern by .012" to .015". *Id.* at 680-81. Dunlop's Maxfli golf balls had an icosahedral pattern in which the dimples overlapped the great circles by .004" to .009". *Id.* at 681.

47. Patent 194,030,432 disclosed an icosahedral golf ball dimple pattern in which the dimples were centered on the six great circles.

48. *Wilson*, 904 F.2d at 684.

49. *Id.*

50. *Id.* at 685.

51. *Id.*

52. *Wilson* prompted several authors to propound at length on the decision's possible consequences. See Michael L. Keller & Kenneth J. Nunnenkamp, *Patent Law Developments in the United States Court of Appeals for the Federal Circuit During 1990*, 40 AM. U. L. REV. 1157 (1990); Henrik D. Parker, *Doctrine of Equivalents Analysis After Wilson Sporting Goods: The Hypothetical Claim Hydra*, 18 AIPLA Q.J. 262 (1990); William E. Eshelman, Comment, *The Doctrine of Equivalents in Patent Law: Post-Pennwalt Developments*, 65 TUL. L. REV. 883 (1991).

53. 927 F.2d 1552 (Fed. Cir.), cert. denied, 112 S. Ct. 281 (1991).

ent claim. . . ."<sup>54</sup> Judge Rich's use of non-compulsory language regarding the hypothetical indicates that he considered it merely one possible tool for evaluating prior art. This position was reaffirmed in *Key Manufacturing Group v. Microdot, Inc.*<sup>55</sup> In *Key Manufacturing Group*, the court stated that the *Wilson* hypothetical was not intended as an obligatory equivalents analysis method, but merely a helpful way to define the limits imposed by prior art on the range of equivalents that a patent holder may claim.<sup>56</sup>

Thus, the *Wilson* hypothetical method for evaluating the effect of prior art on the range of a patentee's equivalents is merely one method for evaluating prior art. Whether the hypothetical or some other method is used, the prior art works in conjunction with the patent, the prosecution history, and usually the pioneering nature of the patent to define a patent's range of equivalents.

### C. *The Pioneering Nature of a Patent*

Very early in the development of the doctrine of equivalents, it was conceived that the range of a patent's equivalents would be limited by the degree to which the patent was a pioneering invention.<sup>57</sup> Courts have often stated that "the range of equivalents depends on and varies with the degree of invention."<sup>58</sup>

Pioneering inventions may claim a broad range of equivalents.<sup>59</sup> An invention that is not as revolutionary as a pioneering invention, but which is a significant evolution over prior inventions, is afforded a substantial range of equivalents.<sup>60</sup> Inventions made in a crowded field with little

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54. *Id.* at 1561.

55. 925 F.2d 1444 (Fed. Cir. 1991).

56. *Id.* at 1449.

57. See *Morley Sewing-Machine Co. v. Lancaster*, 129 U.S. 263, 273 (1889) (adopting the concept of expanding a patentee's rights where the claim was particularly innovative, although not specifically using the term "pioneering nature").

58. *Texas Instruments, Inc. v. United States Int'l Trade Comm'n*, 805 F.2d 1558, 1563 (Fed. Cir. 1986); *Continental Paper Bag Co. v. Eastern Paper Bag Co.*, 210 U.S. 405, 412 (1908); *Miller v. Eagle Mfg. Co.*, 151 U.S. 186, 187 (1894).

59. See *Intel Corp. v. United States Int'l Trade Comm'n*, 946 F.2d 821, 842 (Fed. Cir. 1991); *Slimfold Mfg. Co. v. Kinkead Indus., Inc.*, 932 F.2d 1453, 1457 (Fed. Cir. 1991); *Shields v. Halliburton Co.*, 667 F.2d 1232, 1238 (5th Cir. 1982).

60. See *Price v. Lake Sales Supply R.M., Inc.*, 510 F.2d 388, 394 (10th Cir. 1974) (stating that "a marked improvement in the art is entitled to a substantial range of equivalents"). See also *Hughes Aircraft Co. v. United States*, 717 F.2d 1351 (Fed. Cir. 1983).

significant evolution are afforded only a very narrow range of equivalents.<sup>61</sup>

While gauging inventiveness might at first seem a useful way to interpret the range of equivalents, it is helpful to consider its effective impact and practicality.<sup>62</sup> Consider a modification of the paper clip example discussed earlier. Imagine that the original paper clip patent has expired and that standard three bend paper clips are now made from many different materials in all sorts of sizes and colors. An inventor discovers that by flanging the paper clip's tips apart about thirty degrees, the paper clip will slide more easily onto a stack of paper. The paper clip area is now a crowded field and this invention's lack of significant pioneering would entitle it, at most, to a narrow range of equivalents; it might perhaps be limited only to paper clips with tips flanged a few degrees more or less than the specified thirty degrees. A court interpreting the range of equivalents in this context must narrow the range of equivalents by considering the prior art.<sup>63</sup> After considering all of the items crowding the field, the impact of considering the pioneering nature may be negligible.

Prescribing a limited range of equivalents because an invention is not pioneering may erroneously skew the judicial determination by considering inventiveness both in the context of the amount of prior art and in the context of the pioneering nature of the patent claim.<sup>64</sup> In a crowded area, there is a great deal of prior art that narrows the range of equivalents that the patentee may claim. Similarly, it is oximoronic to speak of a pioneering invention in a crowded field; for an invention to be pioneering, it must open a new field.<sup>65</sup> It is appropriate to think of a pioneering invention as conferring a benefit on society that is comparatively great as a result of its revolutionary rather than evolutionary impact. In short, there will never be much prior art if the invention is pioneering, and

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61. See *Chemical Engineering Corp. v. Essef Indus., Inc.*, 795 F.2d 1565, 1573 n.8 (Fed. Cir. 1986) ("The district court correctly held on the record before it that [the patent] could not be considered a pioneer patent, because it issued in a crowded art.").

62. The term "inventiveness" is used here, as by many courts, to connote the patent's degree of evolution. As used here, the term does not suggest that the patent lacks invention, for that would be a contradiction in terms under the requirements for patentability. 35 U.S.C. §§ 102, 103 (1988).

63. See *supra* note 9 and accompanying text.

64. *CHISUM*, *supra* note 33, § 18, at 18-111.

65. *Texas Instruments, Inc. v. United States Int'l Trade Comm'n*, 805 F.2d 1558, 1570 (Fed. Cir. 1986).

conversely, there will be much prior art if the invention is not pioneering.

There is considerable overlap in considering both the prior art and the pioneering nature. This consideration effectively forces double consideration of the lack of the invention's pioneering nature. Thus, pioneering nature based on a patent's "inventiveness," distinct from the prior art, can be a misleading guideline and has promoted one scholar to remark that "[d]espite the frequency with which it is evoked, the 'range' concept is of doubtful value as an aid in the construction of patent claims."<sup>66</sup>

Because the Federal Circuit has not abandoned consideration of an invention's pioneering nature in fixing a range of equivalents to which a patent may be entitled, it is helpful to use it in conjunction with the patent claim, the prior art, and the prosecution history in evaluating a patentee's limit for a successful doctrine of equivalents claim.

#### IV. POLICIES UNDERLYING THE DOCTRINE OF EQUIVALENTS

The doctrine of equivalents is based on equitable principles that may be grouped into three general goals. The first is the fundamental goal underlying patent protection: to promote the development of useful arts.<sup>67</sup> The second and third goals, in contrast, provide a practical limit on how much protection should be afforded a patent. On the one hand, a person should not be able to exploit a patentee's contribution by narrowly designing around the patent's express language.<sup>68</sup> On the other hand, a person trying to design around someone else's patent may advance the useful arts, technology, and should be provided patent protection if he makes an advance over the patented subject matter.<sup>69</sup> In trying to balance these goals, courts have struggled to find a method for applying the doctrine of equivalents that will meet equitable ends with judicial certainty.

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66. CHISUM, *supra* note 33, § 18, at 18-111.

67. U.S. CONST. art. I, § 8, cl. 8.

68. See *Graver Tank & Mfg. v. Linde Air Prods.*, 339 U.S. 605, 607 (1950) (recognizing that meaningful patent protection must prevent avoiding a claim of infringement through insubstantial changes to the inventor).

69. See *Slimfold Mfg. Co. v. Kinkead Indus., Inc.*, 932 F.2d 1453, 1457 (Fed. Cir. 1991).

*A. Encouraging Invention*

Patent protection is intended to encourage inventions in the useful arts. Where an invention offers little that is new or useful, the Federal Circuit is not inclined to provide appreciable protective breadth under the doctrine of equivalents.<sup>70</sup> *Key Manufacturing Group v. Microdot, Inc.*,<sup>71</sup> provides an excellent example of a court limiting the range of equivalents to encourage useful invention.

Key Manufacturing Group held a patent for a decorative lug nut used to secure automobile wheels to a car. The prior art was crowded by many alternative decorative nuts. Key Manufacturing Group's patent claim used two limitations to avoid the prior art: first, a decorative cap was to be welded to the nut over a substantial area, and second, the nut had a flange perpendicular to the axis of the nut.<sup>72</sup>

Microdot produced a competing decorative nut. The Microdot nut also had a decorative cap, but the cap was spot welded in place rather than being welded over a substantial area. Additionally, the Microdot nut had a flange that was at a fifteen degree angle to the nut's axis rather than perpendicular to the nut's axis. The district court held that because the nuts could be used interchangeably, Microdot had infringed Key Manufacturing Group's patent both literally and under the doctrine of equivalents.<sup>73</sup>

The Federal Circuit overturned both the literal and equivalent infringement findings and stated that a *Wilson* "hypothetical claim drawn to cover literally the Microdot nut would not be patentable over the prior art."<sup>74</sup> In other words, where a patent is minimally innovative, it will receive little protection under the doctrine of equivalents.

Limiting the range of items against which a patent holder may claim infringement is one method for encouraging technological advancement of existing technology because it allows competitive development in the area of the patent claim. The challenge in encouraging technological advancement lies in discerning an advancement over existing patents from an

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70. See *Valmont Indus. v. Reinke Mfg. Co.*, 983 F.2d 1039 (Fed. Cir. 1993); *StuDiengesellschaft Kohle v. Eastman Kodak Co.*, 616 F.2d 1315, 1324 (5th Cir. 1980).

71. 925 F.2d 1444 (Fed. Cir. 1991).

72. *Id.* at 1448-49.

73. *Id.* at 1449.

74. *Id.*

exploitation of the patented subject matter. If patents are granted extremely large ranges of equivalents, then neither patent holders nor potential inventors of related technology have any motivation to continue development because the patentee retains the exclusive right to capitalize on that field of technology. If, on the other hand, a patent holder is granted a very narrow range of equivalents, then a potential inventor is discouraged from inventing because he cannot capitalize on his efforts.

### B. Discouraging Fraud on a Patent

The doctrine of equivalents requires looking beyond the policy of merely encouraging inventions in situations where the infringing item does not make a sufficiently substantial change.<sup>75</sup> The designer seeking to pirate the benefits of another patented invention should not be rewarded; yet, the designer may at times develop a distinguishable and useful invention. This is the tension between discouraging piracy and encouraging useful significant evolution.

In *Wallace London and Clemco Products, Inc. v. Carson Pirie Scott & Co.*,<sup>76</sup> the court recognized the policy problems of overly broad patent protection. Carson Pirie Scott & Co. (Samsonite) had allegedly infringed on Wallace's garment bag hanging system. Wallace developed a hang bag clamp that allowed the lower bar of the clamp to open to allow the hangers to be removed. Samsonite subsequently designed a hang bag clamp that allowed the upper bar of the clamp to open to allow the

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75. For some time, courts applied the doctrine of equivalents to find that an article infringed on a patent claim when the article used the heart of the claim. However, the court in *Perkin-Elmer Corp. v. Westinghouse Electric Corp.*, 822 F.2d 1528 (Fed. Cir. 1987), suggested that such language was improper:

We are aware of dicta that state consideration of the "essence", "gist", or "heart" of the invention may be helpful in determining infringement under the doctrine of equivalents. . . . That dicta . . . 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 [which] . . . do not substantially change the function performed, or the way it is performed, by the invention.

*Id.* at 1531 n.8. For a vigorous dissent on this point, see *Perkin-Elmer Corp.*, 822 F.2d at 1535-44 (Newman, J., dissenting). See also *Kinzenbaw v. Deere & Co.*, 741 F.2d 383, 389 (Fed. Cir. 1984) ("The doctrine of equivalents is designed to protect inventors from unscrupulous copyists . . . and unanticipated equivalents.") (citing *Graver Tank & Mfg. v. Linde Air Prods.*, 339 U.S. 605, 607 (1950)).

76. 946 F.2d 1534 (Fed. Cir. 1991).

hangers to be removed.<sup>77</sup> The court acknowledged Samsonite's efforts to design around Wallace's patents, commenting that "[a]lthough inventing around patents to make new inventions is encouraged, piracy is not."<sup>78</sup> Reversing summary judgment for Wallace, and entering instead summary judgment for Samsonite, the court nevertheless held that the two clamps were sufficiently different to avoid infringement.<sup>79</sup> Specifically, the court observed a significant difference in the Samsonite design.<sup>80</sup>

Although the *Wallace* decision suggests that the doctrine of equivalents did not apply, the court reached its decision only after performing a doctrine of equivalents analysis and deciding that Samsonite avoided infringing on Wallace's patent.<sup>81</sup>

### C. *Encouraging Useful Evolution Over Existing Patents*

The primary policy for granting monopoly protection to patent holders is to encourage development of the useful arts.<sup>82</sup> Similarly, however, a patent should not confer such a broad interest in an invention that all advancement related to that invention must be halted for the life of the patent. In *Slimfold Manufacturing Co. v. Kinkead Industries, Inc.*,<sup>83</sup> the court decided that intent to design around existing patents is not by itself relevant to applying the equivalent analysis.<sup>84</sup> The court explained that designing around patents potentially encourages technological development, which, in turn, benefits society.<sup>85</sup> The court then balanced the need to encourage useful development in the arts against a person's willful intent to take the fruits of another. Leaning heavily toward encouraging new evolutionary development,<sup>86</sup> the court stated: "It is only when

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77. *Id.* at 1535-36.

78. *Id.* at 1538.

79. *Id.* at 1540.

80. *Id.*

81. *Id.*

82. See SENATE COMM. ON THE JUDICIARY, AN ECONOMIC REVIEW OF THE PATENT SYSTEM: STUDY NO. 15 OF THE SUBCOMM. ON PATENTS, TRADEMARKS AND COPYRIGHTS, 85TH CONG., 2D SESS. 51 (1958) (stating that one justification for promoting competitive research is that "research teams engaged in inventing around patents [sometimes] hit upon something really useful").

83. 932 F.2d 1453 (Fed. Cir. 1991).

84. *Id.* at 1457.

85. *Id.*

86. *Id.* See also *Charles Greiner & Co. v. Mari-Med Mfg.*, 962 F.2d 1031, 1035 (Fed. Cir. 1992) ("The doctrine of equivalents is an equitable doctrine which prevents fraud on a patent.").



the changes are so insubstantial as to result in 'a fraud on the patent' that the application of the equitable doctrine of equivalents becomes desirable."<sup>87</sup>

Thus, application of the doctrine of equivalents should attempt to balance three primary policies: (1) to encourage and protect only truly inventive patents, (2) to discourage piracy or fraud on a patent, and (3) to encourage evolutionary inventions. Effective implementation of these policies requires practical methods for applying them to specific situations.

## V. RESPONSIBILITY AND METHODS FOR INTERPRETING EQUIVALENTS

Although correctly defining a patent claim's range of equivalents requires a consideration of the equitable policies underlying the doctrine, a reliable method for applying the doctrine is necessary to produce consistently equitable results. One difficulty in defining the range of equivalents is knowing at what level an equivalent may be defined. Some courts have defined the range of equivalents by looking at the patent as a whole,<sup>88</sup> while other courts have scrutinized each limit of each element of the patent claim.<sup>89</sup> The evaluation method will influence the judge or jury's control over the outcome. Describing the areas of responsibility that have been assigned to the judge or to the jury will help to explain the effect of the Federal Circuit's recent adjustments in the doctrine of equivalents infringement analysis. It will also help to take a cautionary note of an analytical method that the Federal Circuit has clearly prohibited,<sup>90</sup> but which nonetheless is repeatedly employed by district courts.<sup>91</sup>

### A. *Who Really Decides: The Judge or The Jury?*

As currently applied, the doctrine of equivalents creates a potential conflict between the judge and jury in determining

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87. *Slimfold*, 932 F.2d at 1457.

88. See *Hughes Aircraft Co. v. United States*, 717 F.2d 1351, 1364 (Fed. Cir. 1963).

89. See *Read Corp. v. Portec*, 970 F.2d 816, 822 (Fed. Cir. 1992); *Malta v. Schulmerich Carillons*, 952 F.2d 1320, 1326 (Fed. Cir. 1991).

90. See *Read Corp.*, 970 F.2d at 822 n.2.

91. See, e.g., *Innovative Scuba Concepts, Inc. v. Feder Indus., Inc.*, 1993 U.S. Dist. LEXIS 5495, at \*11-12 (D. Colo. Apr. 21, 1993) (stating that "[i]n the case of infringement under the doctrine of equivalents, the accused device is compared with the claimed invention as a whole").

infringement. This conflict arises because questions of law and questions of fact often overlap and are interdependent.

The Court in *Graver Tank & Manufacturing v. Linde Air Products Co.*<sup>92</sup> announced that a finding of equivalence is a determination of fact and therefore within the province of the jury. Thus, when arguing infringement under the doctrine of equivalents to a jury, the patentee is required to present a comprehensive showing of how the patent and the allegedly infringing item are the same.<sup>93</sup> The jury must then determine the relevant prior art, infringement, and equivalence.<sup>94</sup> The construction of the patent claim, however, is a question of law.<sup>95</sup> "[I]f ambiguity is thought to surround the prosecution history, . . . that could give rise to a question of fact underlying the legal question of claim construction."<sup>96</sup> Consequently, there is a significant interrelationship between what the jury must be provided and what it must determine.<sup>97</sup>

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92. 339 U.S. 605, 609 (1950). See also *Charles Greiner*, 962 F.2d at 1034 ("This court reviews patent infringement findings as questions of fact. Therefore, only clear errors warrant correction.") (citing *Raytheon Co. v. Roper Corp.*, 724 F.2d 951, 956 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 835 (1984); *Hartness Int'l v. Simplimatic Eng'g Co.*, 819 F.2d 1100, 1110 (Fed. Cir. 1987)).

93. See *Lear Siegler, Inc. v. Sealy Mattress Co.*, 873 F.2d 1422, 1425-26 (Fed. Cir. 1989) (citing *Nestier Corp. v. Menasha Corp.-Lewisystems Div.*, 739 F.2d 1576 (Fed. Cir. 1984), *cert. denied*, 470 U.S. 1053 (1985)). The court in *Lear* interpreted *Nestier* to require that in presenting a doctrine of equivalents infringement claim to a jury, "the three Graver Tank elements must be presented in the form of *particularized testimony and linking argument*." *Id.* at 1426 (emphasis added). See also *Malta v. Schulmerich Carillons, Inc.*, 952 F.2d 1320, 1327 (Fed. Cir.), *cert. denied*, 112 S. Ct. 2942 (1991) (holding that a patentee would show particularized testimony and linking argument if the patentee's "testimony is a sufficient explanation of both why the overall function, way, and result of the accused device are substantially the same as those of the claimed device and why the [accused device] is the equivalent of the claimed . . . limitation") (emphasis omitted).

94. See *Malta*, 952 F.2d at 1325 ("The issues of infringement and of equivalency are issues of fact") (citing *Sun Studs, Inc., v. ATA Equip. Leasing Inc.*, 872 F.2d 978, 986 (Fed. Cir. 1989)). See also *Charles Greiner*, 962 F.2d at 1034; *Jurgens v. McKasy*, 927 F.2d 1552, 1562 (Fed. Cir.), *cert. denied*, 112 S. Ct. 281 (1991).

95. See *Intel Corp. v. United States Int'l Trade Comm'n*, 946 F.2d 821, 835 (Fed. Cir. 1991) (holding that "[c]laim interpretation is a question of law") (citing *Hormone Research Found. v. Genentech*, 904 F.2d 1558, 1562 (Fed. Cir. 1990); *Loctite v. Ultraseal*, 781 F.2d 861, 866 (Fed. Cir. 1985)). See also *Key Mfg. Group v. Microdot*, 925 F.2d 1444, 1447 (Fed. Cir. 1991) (citing *Molecon Research Corp. v. CBS Inc.*, 793 F.2d 1261, 1270 (Fed. Cir. 1986), *cert. denied*, 479 U.S. 1030 (1987); *Charles Greiner & Co., Inc. v. Mari-Med Mfg.*, 962 F.2d 1031, 1034 (Fed. Cir. 1992)).

96. *Palumbo v. Don-Joy Co.*, 762 F.2d 969, 976 (Fed. Cir. 1985).

97. This relationship often creates decisive interpretations of what is or is not within the province of the jury. See, e.g., *Malta*, 952 F.2d at 1331-34 (Newman, J., dissenting).

### B. Defining Equivalent Elements Using Each Limitation

Recently, a well-known scholar erroneously stated that "equivalency is still determined by comparing the claimed subject matter as a whole and the accused device."<sup>98</sup> This statement is undoubtedly the result of a dramatic shift in the Federal Circuit's methodology for applying equivalents. Recent decisions have held that infringement requires that every limitation of a claim be met exactly or by a substantial equivalent.<sup>99</sup> Thus, under this requirement, contemplation of equivalency between the accused device and the patented invention as a whole is erroneous.<sup>100</sup>

The Federal Circuit's shift, however, appears to have reached an apogee past which it may no further proceed without completely eliminating the doctrine of equivalents. This limit necessarily exists because requiring comparative identity between a device and a patent claim at a level more comprehensive than the claimed limits will require literal infringement.<sup>101</sup> To illustrate this point more completely, the following subsections analyze the Federal Circuit's shift in three stages of historical progression: comparing devices as a whole, comparing devices as a whole or by the device's limitations, and comparing devices only by their limitations.

#### 1. The Claim as a Whole

Until fairly recently, the widely accepted method for determining whether a device infringed a patent claim was by "comparing the claimed subject matter as a whole and the accused device."<sup>102</sup> Comparing the claim "as a whole" appears to have been the rule until sometime in the mid-1980s. *Perkin-Elmer Corp. v. Westinghouse Electric Corp.*<sup>103</sup> held that the appeals court did not need to determine whether the district court erred in finding no infringement based only on the absence of equivalence in two claim limitations, because the differences were sufficient "to cause the accused devices to operate as wholes in a way not substantially the same as that

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98. CHISUM, *supra* note 33, § 18, at 18-76 n.3 (emphasis omitted).

99. See, e.g., *Read Corp. v. Portec, Inc.*, 970 F.2d 816, 822 (Fed. Cir. 1992).

100. See, e.g., *id.* at 822 n.2.

101. See *infra* part V.B.3.

102. CHISUM, *supra* note 33, § 18, at 18-76 n.3 (emphasis omitted). See also *Hughes Aircraft Co. v. United States*, 717 F.2d 1351, 1364 (Fed. Cir. 1983) (holding that it was error not to "apply the doctrine of equivalents to the claimed invention as a whole").

103. 822 F.2d 1528 (Fed. Cir. 1987).

in which the claimed devices operate as wholes.”<sup>104</sup> Later in the same year, the Federal Circuit in another decision provided that the “as a whole” approach was no longer the only approach.<sup>105</sup>

## 2. A Time of Ambiguity: The Claim as a Whole or as Every Limitation

Although not widely realized at the time, in *Pennwalt Corp. v. Durland-Wyland, Inc.*,<sup>106</sup> the court marked what the Federal Circuit would identify as the demise of evaluating equivalents as whole devices.<sup>107</sup>

The *Pennwalt* court evaluated whether a fruit sorting system patent had been infringed. The court found no infringement under the doctrine of equivalents and stated “that the district court correctly relied on an element-by-element comparison to conclude that there was no infringement under the doctrine of equivalents, because the accused device did not perform substantially the same functions as the *Pennwalt* invention.”<sup>108</sup> The *Pennwalt* court apparently did not believe that an element-by-element comparison of equivalents of a claim’s limitations and the accused device was the only method for applying the doctrine of equivalents. Specifically, the court stated that “infringement *may* be found . . . if an accused device performs substantially the same overall function or works in substantially the same way, to obtain substantially the same overall result as the claimed invention.”<sup>109</sup>

Whatever the *Pennwalt* court intended, subsequent Federal Circuit decisions did not lead to a clear rejection of the “as a whole” rule in all cases.<sup>110</sup> For example, two years after

104. *Id.* at 1530 n.5.

105. *Pennwalt Corp. v. Durand-Wayland, Inc.*, 833 F.2d 931, 934 (Fed. Cir.), *cert. denied*, 485 U.S. 961 (1987).

106. *Id.*

107. *See, e.g., Intellicall, Inc. v. Phonic Metrics, Inc.*, 952 F.2d 1384, 1389 (Fed. Cir. 1992) (identifying *Pennwalt* as requiring “every limitation” analysis for equivalents and rejecting comparison to the overall device).

108. *Id.* at 935.

109. *Id.* at 934 (emphasis in original). The lack of grammatical parallelism in dropping the word “overall” from the “way” prong of the analysis is noteworthy because there would seldom be a colorable claim if a device failed to perform the same function and achieve the same result. Infringement under the doctrine of equivalents is primarily used to evaluate the “way” prong, and by deleting the related “overall” requirement the court may have been intending that the element-by-element comparison of limitations apply only when evaluating the “way” prong.

110. *See Eshelman, supra* note 52 (arguing that after *Pennwalt*, there are proper

*Pennwalt*, the Federal Circuit stated that it specifically did not set out a definitive formula for determining equivalency, but that performing an equivalency analysis using claim limitations was merely a helpful approach.<sup>111</sup>

The court in *Sun Studs, Inc. v. ATA Equipment Leasing, Inc.*<sup>112</sup> tried to clarify the rule that the element-by-element analysis was optional. The court stated that "[o]ne-to-one correspondence of components is not required, and elements or steps may be combined without ipso facto loss of equivalency."<sup>113</sup> *Sun Studs* suggests that a court applying the doctrine of equivalents may interpret the range of equivalents based on the patent, its prosecution history, and the prior art using either the "every limit" method or the "substantially the same manner" method, which seems to be synonymous with the "as a whole" method. This perspective, however, turned out to be very short-lived.

### 3. The Claim as Every Limitation

The Federal Circuit has completely and unmistakably abandoned comparison of the patent invention "as a whole" to the accused device when performing doctrine of equivalents infringement analysis.<sup>114</sup> Numerous Federal Circuit decisions in the last three years reflect a growing adversity toward application of the doctrine of equivalents to components, claims, devices, patents, or inventions, instead of exclusively to claim limitations.<sup>115</sup> The Federal Circuit specifically discourages "speaking of 'equivalency' between [an] accused device and [a]

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places like simple inventions for application of "as a whole" approach and places like complex issues where "each" approach limitation analysis is more appropriate, and arguing that *Pennwalt* did not answer what defines an equivalent).

111. *Corning Glass Works v. Sumitomo Electric U.S.A.*, 868 F.2d 1251, 1260 (Fed. Cir. 1989). See also *Uniroyal, Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 1057 (Fed. Cir.), cert. denied, 488 U.S. 825 (1988) (holding that the district properly found a doctrine of equivalents infringement of a patent for a truck wind deflector even though the district court applied the doctrine of equivalents only to two specific claim limitations rather than determining whether the device "performs in substantially the same manner") (emphasis in original).

112. 872 F.2d 978 (Fed. Cir. 1989).

113. *Id.* at 989. See also *Intel Corp. v. United States Int'l Trade Comm'n*, 946 F.2d 821, 832 (Fed. Cir. 1991) (citing *Corning Glass Works*, 868 F.2d at 1259).

114. See *Read Corp. v. Portec Inc.*, 970 F.2d 816, 822 n.2 (Fed. Cir. 1992).

115. See *Valmont Indus. v. Reinke Mfg. Co.*, 983 F.2d 1039, 1043 n.3 (Fed. Cir. 1993); *Read Corp.*, 970 F.2d at 822; *Intellicall, Inc. v. Phonometrics, Inc.*, 952 F.2d 1384, 1389 (Fed. Cir. 1992); *Key Mfg. v. Microdot, Inc.*, 925 F.2d 1444, 1449 (Fed. Cir. 1991); *Jurgens v. McKasy*, 927 F.2d 1552, 1560 (Fed. Cir.), cert. denied, 112 S. Ct. 281 (1991); *Becton Dickinson and Co. v. C.R. Bard, Inc.*, 922 F.2d 792, 798 (Fed. Cir. 1990).

patented invention."<sup>116</sup> The correct way is to "speak only of infringement of a claim and of an equivalent to a limitation of the claim."<sup>117</sup>

The paper clip hypothetical provides an example of the practical effect of the new "every limit" method. Imagine a patent that reads: "I claim—A non-invasive paper fastening device comprising a piece of wire comprised of metal, said wire having three 180 U-bends, said bends all lying in a single geometric plane." The accused device is identical in all respects except that it is made of plastic, a material that had not been developed when the patent issued. The function and result of both the accused device and the claim are identical—they both use the clip's shape to hold papers together. Under the former method of comparison as a whole, the relevant question is whether a metal paper clip functions in substantially the same way as a plastic paper clip. Under the new method of comparison of every element, the relevant question is whether metal functions in substantially the same way as plastic. This latter question appears to be a much narrower issue and much more likely to result in a finding of non-infringement.

One commentator has argued that the "every limitation" test is appropriate in complex situations where a jury is involved, while the "as a whole" test works best for simpler devices.<sup>118</sup> But by adopting the "every limitation" test exclusively, the Federal Circuit is essentially making a policy decision that any doctrine of equivalents infringement analysis is too difficult for juries to fully understand.

## VI. EXPANDING THE USE OF HYPOTHETICAL ANALYSIS

The doctrine of equivalents will be a judicially uncertain method of analysis as long as it remains an equitable doctrine that is not defined by brightline rules. Moreover, as the Federal Circuit has demonstrated over the past few years, the method for applying the doctrine may also change, further compounding such uncertainty.<sup>119</sup> These changes are likely to correspond to differing perceptions of the proper balance of policies underlying the doctrine. The Federal Circuit's strict, new "every limitation" analysis method will probably cause

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116. *Read Corp.*, 970 F.2d at 822 n.2.

117. *Id.* (citation omitted).

118. See Eshelman, *supra* note 52.

119. See *supra* part V.B.

fewer courts to find infringement under the doctrine of equivalents. The new method apparently reflects a policy shift from preventing fraud on a patent to encouraging evolutionary invention. The Federal Circuit's shift may also be attributed to its lack of confidence in juries and district courts, who seldom hear patent cases involving doctrine of equivalents infringement. A brief summary of the problems remaining with the doctrine of equivalents, however, will serve to emphasize the benefits of applying the proposal offered in this Comment.

### A. A Problem Calling for Change

There is an inherent educational conflict in the patent dispute system. Often only the litigants fully understand a patent, particularly if the patent involves sophisticated technological developments. For instance, the litigants may be the only people in the world focusing on the genetic or electronic development covered by a patent. In such a conflict, it is not possible to educate the judge or jury sufficiently so that they can fully grasp the technology at issue, appreciate how little or how much that technology steps away from the prior art, or determine the degree to which it is a pioneering invention. Consequently, if the decision-maker lacks specialized knowledge, it will not be possible to accurately define equivalents using any technique.

The court in *Intel Corp. v. United States International Trade Commission*<sup>120</sup> faced this problem in addressing the alleged infringement of computer chips. Intel Corporation had made significant strides in electrically programmable read only memory devices (EPROMs). Atmel and GI/M were found to have infringed Intel's patented EPROM.<sup>121</sup> Both Atmel's and GI/M's systems used a multiplexer to direct signals coming into the memory device, while Intel integrated a selective signal acceptance function using an address buffer to direct signals coming into the EPROM. The court affirmed the United States International Trade Commission's (ITC) finding that although Atmel and GI/M used a different method for processing the signal, it infringed on Intel's patent because the same function was performed elsewhere in the accused device.<sup>122</sup>

The technical complexity of the claimed infringement

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120. 946 F.2d 821 (Fed. Cir. 1991).

121. *Id.* at 824.

122. *Id.* at 832.

combined with a lack of familiarity with the doctrine of equivalents could have created confusion for a jury. Although the ITC may not have been as familiar with the technology as the litigants, the court pointed out that fortunately, "[u]nlike a jury in a district court case, the [International Trade] Commission resolves disputes involving patent infringement matters with some regularity and thus is aware of doctrine of equivalents jurisprudence."<sup>123</sup> Thus, the Federal Circuit seems to recognize that a jury may have difficulty achieving equitable decisions using the doctrine of equivalents as it is currently applied.

*B. A Proposal for Improvement: The Every Element Hypothetical*

The requirement that a decision-maker find literal or equivalent infringement of each claim limitation seems to stem from the Federal Circuit's apprehension over the competence of juries to properly apply the doctrine of equivalents.<sup>124</sup> The Federal Circuit, however, has a more effective tool available that, with a modest amount of modification, could achieve the same objective more effectively. The hypothetical proposed in *Wilson* should be adopted as the standard analysis method, expanding it to contemplate not merely limitations imposed by the prior art, but also each limitation of the patent claim, the patent's prosecution history, and the pioneering nature of the invention.

The benefit of this proposal becomes clear when viewed in the context of the judge and jury's respective responsibilities. Because the judge has the responsibility for claim interpretation, construction of the hypothetical would primarily be the judge's responsibility and would be reviewable *de novo*. The jury would have input into what constitutes prior art because that is a determination of fact. After the hypothetical claim is determined, the jury would have the benefit of the hypothetical to determine whether it is equivalent to the original claim. Finally, the accused device would have to read on the equivalent version of the claim in order to find infringement.

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123. *Id.* at 832-33.

124. *See Read Corp. v. Portec Inc.*, 970 F.2d 816, 822 n.2 (Fed. Cir. 1992) ("[L]imitations of the claim must be the focus of the inquiry, *particularly in jury trials*. Otherwise, *laymen may be led* to comparison of devices, rather than between the accused device and the claim, and to rely on generalities in the overall purpose of the devices.") (emphasis added).



When it was first introduced, Judge Rich stated that use of the hypothetical for evaluating prior art was a helpful, but optional tool.<sup>125</sup> The patent community received his proposal with both skepticism and fear, but it would be more appropriate to embrace and expand on his idea.<sup>126</sup> The hypothetical tool is just as well-suited to evaluating a patent, its prosecution history, and its inventiveness as it is to evaluating prior art. The hypothetical need not be merely a tool for the decision-maker to use, but could be an effective litigating tool for the parties. Just as a picture often communicates better than words, expanded use of the hypothetical would provide an efficient means for defining the range of equivalents and would avoid potential jury confusion.

The effectiveness of the hypothetical is best considered with an example. To illustrate how expanding the hypothetical analysis to include all aspects of analysis under the doctrine of equivalents, consider the familiar paper clip. The effectiveness of the hypothetical can be illustrated by setting up a patent, prior art, prosecution history, the pioneering nature of the claimed patent, and some potentially infringing items.

#### 1. The Patent, Prior Art, Prosecution History, and Pioneering Nature

Imagine that the world did not have paper clips of any sort, but that it did have staples, tape, and clothes pins, although no one had thought of using clothes pins for fastening papers together. Mr. Clip's standard three bend paper clip was a remarkable success. Within two months one million paper clips were sold. Imitators began rushing into production. Mr. Clip quickly applied for a patent.

Mr. Clip's original patent claim application read: "I claim—A paper fastening device comprised of a material that may be bent several times for securing multiple sheets of paper." The PTO realized that Mr. Clip's patent application would include staples and tape (they apparently did not think that clothes pins were relevant). Mr. Clip conceded and rephrased his patent to read: "I claim—A non-invasive paper

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125. See *supra* part III.B (contrasting Judge Rich's opinions in *Wilson Sporting Goods v. David Geoffrey & Assocs.*, 904 F.2d 677 (Fed. Cir.), *cert. denied*, 111 S. Ct. 537 (1990) and *Jurgens v. McKasy*, 927 F.2d 1552 (Fed. Cir.), *cert. denied*, 112 S. Ct. 281 (1991)).

126. See *Parker, supra* note 52.

fastening device comprised of a piece of wire made of metal, said wire having three 180 U-bends, said bends all lying in a single geometric plane." This concession is the complete prosecution history.

Some time after Mr. Clip patented his paper clip, plastic was invented and replaced metal wire hair pins. Ms. Crafty obtained a license to use the plastic and made a plastic three-bend paper clip the same shape as Mr. Clip's. Mr. Clip argues that his patent is being infringed on under the doctrine of equivalents by both devices. The problem is to find a way to reliably apply the doctrine of equivalents to such a fact pattern and produce a decision that is consistent with the policies underlying that doctrine.

## 2. Problems Applying the "Every Limit" Method

The "every limit" method for evaluating doctrine of equivalents infringement could potentially fail to properly balance the equitable policies underlying the doctrine. This failure can be illustrated under the paper clip example by identifying the patent claim limits, performing a limit-by-limit comparison to each of the accused devices, and identifying the potential for skewed analysis of the limits that are not exactly met.

Evaluating Mr. Clip's infringement action under the "every-limit" approach requires that the patent's claim limits be defined. The three bend paper clip patent has five limits: (1) it is non-invasive, (2) made of metal wire, (3) with three bends, (4) in a single plane, and (5) the bends are U-shaped.

The claim limits are compared to that of the accused device to find which limits are exactly met and which are met by a substantial equivalent. Ms. Crafty's three bend plastic paper clip is non-invasive and has three U-shaped bends in a single plane. Thus, the only limit not exactly met is the second requirement that the device be made of metal wire. The question under the doctrine of equivalents becomes whether plastic wire performs substantially the same function in substantially the same way to achieve substantially the same result as metal wire.

To answer this question, a jury will have to decide: (1) whether there are any analogous materials in the prior art, (2) whether Mr. Clip's revised version of his claim actually conceded that the device had to be made of metal, (3) whether the

intervening invention of plastic and substitution for metal in hair-pins made the substitution obvious, (4) whether the paper clip was so ingenious that it deserved the broader range of equivalents afforded a pioneering invention, and, based on the preceding, (5) whether plastic wire works in substantially the same way as metal and thus whether Ms. Crafty's device infringes Mr. Clip's patent.

### 3. Expanded Hypothetical Analysis

Expanded hypothetical analysis could be accomplished by requiring the parties to submit their version of how the hypothetical would read and how their interpretation properly accounts for the prior art, prosecution history, and pioneering nature of the invention. In essence, both an expanded hypothetical analysis and an "every-limit" analysis will have the same people making the same decision. The advantage is that the hypothetical method forces a step-by-step analysis into the decision-making process. In Mr. Clip's case, the jury would answer three questions: (1) Is there any prior art? (2) Was the addition of the word 'metal' to Mr. Clip's claim made to differentiate his paper clip from prior inventions? and (3) Was the paper clip a revolutionary or pioneering invention as opposed to an evolutionary one? After these factual questions are resolved, the court can use the jury's answers to construct a hypothetical version of the claim limit and then return the question to the jury for a determination of whether the accused device infringes that limit.

Granted, this is necessarily a simplistic example; however, the more sophisticated the patent, the more effectively a hypothetical can be used by the litigants to assist the judiciary in accurately defining the range of equivalents. This example illustrates that the hypothetical can be expanded to take into account not only the prior art, but also the prosecution history and pioneering nature of the invention. Therefore, the necessity of a judge or jury having to struggle to understand the technology involved in the dispute is reduced. Because the litigants must define with precision all of the relevant information and provide an accommodating interpretation using a hypothetical, flaws in that hypothetical are more likely to be obvious.

## VII. CONCLUSION

The Federal Circuit's effort to facilitate the equitable purposes underlying the doctrine of equivalents has created confusion as the methods of application have changed. It is necessary to define a single patent interpretation method that provides for equitable patent construction and establishes a reliable level of judicial certainty. This can best be achieved by employing and expanding the hypothetical evaluation technique used in *Wilson*. This technique may be readily expanded from merely considering prior art to also considering prosecution history and the pioneering nature of the invention. Using the hypothetical as a basis, the parties to the litigation may avoid the difficulties in jury confusion about the technology and rules at issue by having an adaptable presentation tool that will narrowly focus the dispute. A more rigid and predictable framework for evaluating patents will result, yet that result will not impair the judiciary's ability to render equitable decisions.

Although some believe that the hypothetical is a beast to fear like the multi-headed Hydra of Greek mythology,<sup>127</sup> the hypothetical is not a beast to be conquered as Hercules slayed and burned each of the Hydra's nine heads; it is a beast to serve as a vehicle for achieving justice. A better analogy for the hypothetical would be to consider it like the Pegasus who carried Bellerophon to smite the evil Chimera.<sup>128</sup> Pegasus is like the hypothetical, Bellerophon represents the pursuit of equity and the Chimera represents the confusion surrounding the application of the doctrine of equivalents.

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127. See Parker, *supra* note 52.

128. See THOMAS BULFINCH, *THE AGE OF FABLE VOLUME ONE* 126 (1913). Bellerophon was a soldier sent by the gods to kill the Chimera, a fire breathing creature with a lion's head, a goat's body, and a serpent's tail, who was wreaking destruction on humanity. Bellerophon was allowed to fly on the back of the Pegasus, and as they flew down upon the Chimera, the Pegasus' hooves struck the Chimera, allowing Bellerophon to finish the Chimera off and save humanity.