

WARNER-JENKINSON COMPANY, INC. V. HILTON DAVIS CHEMICAL CO.

By Jing James Li

In a patent infringement case, when a patent's claim language reads on the accused product, the accused product literally infringes the patent.¹ In a case where there is no literal infringement, however, infringement is still possible under the doctrine of equivalents.²

Recently, the United States Supreme Court reviewed the doctrine of equivalents in *Warner-Jenkinson Company, Inc. v. Hilton Davis Chemical Co.*³ This comment explains that the Court clarified many controversial aspects surrounding the doctrine, but argues that the Court left some issues unresolved.

I. THE DOCTRINE OF EQUIVALENTS: HISTORY AND CONTROVERSIES

The origin of the doctrine of equivalents is often attributed to the Supreme Court's decision in *Winans v. Denmead*.⁴ The central question in *Winans* was whether a change in the form of a patented machine that took a product outside the literal description of a patent could still infringe the patent. The Court used a "mode of operation" test; that is, if the alleged infringing device embodies the mode of operation of the patented invention, producing "the same new and useful results" of the original inven-

© 1998 Berkeley Technology Law Journal & Berkeley Center for Law and Technology.

1. An "accused product" is the product that is alleged to infringe a patent. A patent claim "reads on" an accused product when the product encompasses all the elements of the patent claim. For patent infringement in general, see DONALD S. CHISUM, CHISUM ON PATENTS, § 16.02 (1996); ROBERT P. MERGES, PATENT LAW AND POLICY 825-966 (2d ed. 1997).

2. In general, infringement under the doctrine of equivalents is found if there is only insubstantial difference between the patented and the accused devices. See CHISUM, *supra* note 1; MERGES, *supra* note 1.

3. ___ U.S. ___, 117 S. Ct. 1040, 41 U.S.P.Q.2d (BNA) 1865 (1997).

4. 56 U.S. 330 (1853). In *Winans* the patented invention was a cylindrically-shaped freight car design. The Court held that the patent represented a new "mode of operation" that achieved nearly equal pressure in all directions by the entire load and therefore greatly increased the maximum load a car could carry. *Id.* at 333. The Court found that an octagonally-shaped car infringed the patent on the grounds that both the disclosed cylindrical form and the accused octagonal form were only different geometric embodiments of the patented invention. *Id.* at 334.

tion, it infringes the patent.⁵ Later, the Supreme Court reformulated the test as the so-called "function-way-result test:" "[O]ne thing is substantially the same as another, if it performs substantially the same function in substantially the same way to obtain the same result"⁶

The Supreme Court last looked at the doctrine of equivalents in *Graver Tank & Mfg. Co. v. Linde Air Products Co.*⁷ *Graver Tank* restated the policy grounds for the doctrine as preventing patent fraud through immaterial changes.⁸ The Court held that equivalency is an issue of fact and "must be determined against the context of the patent, the prior art, and the particular circumstances of the case."⁹ One important factor in determining equivalency, the Court held, is whether a person reasonably skilled in the art would have known the interchangeability of an element of the invention with its replacement in the accused product.¹⁰

Since *Graver Tank*, lower courts (especially the Court of Appeals for the Federal Circuit) have continued to refine the doctrine of equivalents. Over the years, there have been several notable doctrinal developments in this area. First, the scope of equivalency can encompass after-arising arts—equivalent replacement made possible by technologies developed after the patent grant.¹¹ Second, two constraints on the doctrine have been recognized. One is prior art (i.e., the scope of equivalency cannot be expanded into prior art); the other is prosecution history estoppel (i.e., if the patentee surrenders a subject matter to distinguish prior art, he cannot recover the subject matter through the doctrine of equivalents).¹² The Fed-

5. *See id.* at 341.

6. *Union Paper-Bag Machine Co. v. Murphy*, 97 U.S. 120, 125 (1877).

7. 339 U.S. 605, 85 U.S.P.Q. (BNA) 328 (1950) (upholding the lower court's finding that substitution of manganese silicate for magnesium silicate as a principle composition of a patented welding flux constituted infringement by equivalency, despite the fact that manganese was not included in the alkaline earth metal claimed by the patent).

8. *See id.* at 607, 85 U.S.P.Q. at 330 ("Outright and forthright duplication is a dull and very rare type of infringement. To prohibit no other would place the inventor at the mercy of verbalism and would be subordinating substance to form.")

9. *Id.* at 609, 85 U.S.P.Q. at 330 ("Equivalence, in the patent law, is not the prisoner of a formula and is not an absolute to be considered in a vacuum.")

10. *See id.*, 85 U.S.P.Q. at 331.

11. *See, e.g., Hughes Aircraft Co. v. United States*, 717 F.2d 1351, 219 U.S.P.Q. (BNA) 473 (Fed. Cir. 1983) (finding that using post-invention computer technology to process data on board satellite is an equivalent of the patented invention that claimed a method involving transmitting the data back to earth for processing).

12. *See, e.g., Carman Industries, Inc. v. Wahl*, 724 F.2d 932, 942, 220 U.S.P.Q. (BNA) 481, 489 (Fed. Cir. 1983) ("The doctrine of equivalents is subject to two types of limitation which may prevent a finding of infringement: (1) estoppel based on the prose-

eral Circuit also developed an element-by-element comparison method to determine the equivalency of the whole device,¹³ based on the notion that "infringement requires that every limitation of a claim be met literally or by a substantial equivalent."¹⁴

There are many controversies surrounding the doctrine of equivalents. Some have argued that the doctrine lacks an adequate basis in law or policy.¹⁵ The most persuasive argument against the doctrine, however, is that it should be an equitable exception but not a general rule allowing patentees "a second bite at the apple."¹⁶ The so-called peripheral claiming practice in the United States¹⁷ has also been suggested to limit the doctrine's application.¹⁸

cution history of the patent ('file wrapper estoppel') and (2) invalidity of the claims according to the proposed construction in view of the prior art.").

13. The so-called element-by-element methodology refers to the equivalency test that breaks the patented invention into elements and finds equivalency only when the accused product contains all the elements or their equivalents. *See, e.g., Pennwalt Corp. v. Durand-Wayland, Inc.*, 833 F.2d 931, 4 U.S.P.Q.2d (BNA) 1737 (Fed. Cir. 1987), *cert. denied*, 485 U.S. 961 (1988) (finding no equivalency because the patent for fruit sorting machine claimed an element of continuously tracking fruit positions while the accused device sorts fruits by storing sorting criteria in memories without continuously indicating the fruit positions).

14. *Intellical, Inc. v. Phonometrics, Inc.*, 952 F.2d 1384, 1389, 21 U.S.P.Q.2d 1383, 1387 (Fed. Cir. 1992).

15. *See, e.g., Kurt L. Glitzenstein, Article: A Normative and Positive Analysis of the Scope of the Doctrine of Equivalents*, 7 HARV. J. LAW TECH. 281 (1994) (arguing that the doctrine of equivalents should be eliminated on both constitutional and economical grounds). Many have argued that Congress has eliminated the doctrine by negative implication, because the Legislature has enacted section 112, ¶ 6 of the Patent Act, which authorizes that means-plus-function claims be construed to include equivalents of corresponding disclosure in the specification. *See, e.g., Hilton Davis Chemical Co. v. Warner-Jenkinson Co., Inc.*, 62 F.3d 1512, 1536, 35 U.S.P.Q.2d (BNA) 1641, 1663 (Fed. Cir. 1995) (Plager, J., dissenting) ("If Congress wanted to provide for equivalents to what is claimed it knew how to do it").

16. *See, e.g., Clarence J. Fleming, The Doctrine of Equivalents—Should it be Available in the Absence of Copying?*, 76 J. PAT. & TRADEMARK OFF. SOC'Y 233, 234 (1994).

17. Central claiming claims the point of novelty or the essence of the invention, while peripheral claiming delineates the metes and bounds of invention. *See ANTHONY W. DELLER, PATENT CLAIMS*, §§ 5 & 10 (2d ed. 1971).

18. It has been argued that the doctrine of equivalents is a rule applicable to the central claiming only and should be limited to exceptional cases in a peripheral claiming system as exists in the United States. *See, e.g., Hilton Davis*, 62 F.3d at 1565-67, 35 U.S.P.Q.2d at 1686 (Nies, J., dissenting) (arguing that change from central to peripheral claims was effected by the Patent Act of 1870 and that the change restricted the court's interpretation of patent coverage to the scope of claim); *see also DELLER, supra* note 17, § 11 (stating that under the peripheral definitional system the doctrine of equivalents narrows the scope of the claims instead of broadening it).

Controversies also arise from implementation of the doctrine of equivalents. Some have argued that the function-way-result test is inadequate and overbroad.¹⁹ Others argued that equivalency should be determined at the time of patent application and should not include after-arising art.²⁰ In relation to the proposed equitable nature of the doctrine, many have suggested that the issue of equivalency should be decided by judges, instead of by juries,²¹ and that the doctrine should not apply to independent developers.²²

II. THE WARNER-JENKINSON CASE

The controversies surrounding the doctrine of equivalents culminated in the Federal Circuit's decision in *Hilton Davis v. Warner-Jenkinson*.²³ The case involved a process patent owned by Hilton Davis which disclosed an ultrafiltration purification of a group of azo dyes for food staining purposes.²⁴ During the prosecution, the inventors added the phrase "at

19. See, e.g., *Hilton Davis*, 62 F.3d at 1546, 35 U.S.P.Q.2d at 1669 (Lourie, J., dissenting) (arguing that the function-way-result test does not reliably reflect what the invention is).

20. See, e.g., *id.* at 1572, 35 U.S.P.Q.2d at 1691 (Nies, J., dissenting) (arguing that the case law prior to *Graver Tank* was that equivalency had to be known at the date of the patent).

21. See, e.g., *id.* at 1543, 35 U.S.P.Q.2d at 1666 (Plager, J., dissenting) (arguing that application of the doctrine of equivalents lies exclusively in the court of equity and equity powers are exercisable only by judges).

22. See, e.g., *id.* at 1547, 35 U.S.P.Q.2d at 1671 (Lourie, J., dissenting) (arguing that an independent developer who unintentionally happens to come close to the claims of a patent should be treated differently because the purpose of doctrine of equivalents is to defeat piracy).

23. 62 F.3d 1512, 35 U.S.P.Q.2d, 1641 (Fed. Cir. 1995).

24. See U.S. Pat. No. 4,560,746. Claim 1 of the patent states:

1. In a process for the purification of a dye selected from the group consisting of [5 azo dye compounds] as the products resulting, respectively, from [5 chemical reactions], said dye being present in the resulting reaction mixtures, along with impurities, the improvement which comprises: subjecting an aqueous solution of the reaction mixture resulting from said coupling or said sulfonation to ultrafiltration through a membrane having a nominal pore diameter of 5-15 Angstroms under a hydrostatic pressure of approximately 200 to 400 p.s.i.g., at a pH from approximately 6.0 to 9.0, to thereby cause separation of said impurities from said dye, said impurities of a molecular size smaller than the nominal pore diameter passing into the permeate on the downstream side of said membrane and said dye remaining in the concentrate, and when substantially all said impurities have been removed from said concentrate, as evidenced by their essentially absence in said permeate, recovering said dye, in approximately 90% pu-

a pH from approximately 6.0 to 9.0²⁵ into Claim 1 of the patent to distinguish a prior art²⁶ that taught an ultrafiltration method for purifying polymeric colorants at a pH of from 9.0 to 13.²⁷ Warner-Jenkinson Company, Inc. independently developed its ultrafiltration process, which was essentially identical to Hilton Davis' patented process except that Warner's process operated at pH 5.²⁸ A jury found that Warner-Jenkinson infringed the patent under the doctrine of equivalents.²⁹

The Federal Circuit affirmed en banc by a 7 to 5 decision.³⁰ The majority's per curiam opinion addressed many important issues regarding the doctrine of equivalents. The court held that the function-way-result test is important, but not the only way to determine equivalency. Other factors, such as the interchangeability of elements, were also held relevant in considering the insubstantiality of the differences between patented and accused devices.³¹ The court further ruled that patent infringement is a strict liability violation that does not turn on the motive of the accused infringers. The court reemphasized that equivalency is an issue of fact for the jury, not a tool of equity to be applied at the court's discretion. The five dissenting judges wrote three separate opinions addressing many aspects of the doctrine, from its basic validity to testing criteria.³²

In a unanimous decision written by Justice Thomas,³³ the Supreme Court reversed and remanded the case, placing the burden on Hilton Davis to prove that the surrender of the pH range below pH 6 was not made to

rity from said concentrate by evaporation of said concentrate to dryness.

25. *Id.*

26. *See* U.S. Pat. No. 4,189,380. The patent claims a ultrafiltration process for purifying polymeric colorant of molecular weight above 1000 Dalton from solutions containing colorant precursors and degradation products. Claim 9 states the filtration conditions as "an inlet pressure of from 25 to 200 psig, and a temperature of from 10°C to 75°C and a feed pH of from 9.0 to 13."

27. *Hilton Davis*, 62 F.3d at 1515-16, 35 U.S.P.Q.2d at 1643.

28. *Id.*

29. *Id.*

30. *Id.* at 1512, 35 U.S.P.Q.2d at 1642. Judges Clevenger, Cowen, Mayer, Michel, Rader, and Schall filed the per curiam opinion. Judge Newman wrote a separate concurring opinion. Judge Plager wrote a dissenting opinion, in which Chief Judge Archer and Judges Rich and Lourie joined. Judge Lourie wrote a separate dissenting opinion, in which Judges Rich and Plager joined. Judge Nies filed a separate dissenting opinion, in which Chief Judge Archer joined in part.

31. The word "device" in this comment is used to denote all subject matters including machines and chemicals.

32. *Hilton Davis*, 62 F.3d at 1512-36, 35 U.S.P.Q.2d at 1661-99.

33. Justice Ginsberg filed a concurring opinion in which Justice Kennedy joined.

distinguish prior art.³⁴ Nevertheless, the Court restated the vitality of the doctrine of equivalents and affirmed the Federal Circuit's holdings regarding intent to infringe, after-arising art, the linguistic framework of the equivalency test, and the role of juries in finding equivalency.

III. THE VALIDITY OF THE DOCTRINE OF EQUIVALENTS

One of the most important holdings of *Warner-Jenkinson* was the affirmation of the doctrine of equivalents. The Supreme Court disposed of the argument that Congress intended to overrule *Graver Tank* by enacting the 1952 Patent Act. The Court held that the 1952 Patent Act is not materially different from the 1870 Act with regard to claiming, reissue, and the role of the Patent & Trademark Office (PTO) in examination.³⁵ The Court also held that the provision embodied in section 112, paragraph 6 of the Patent Act³⁶ was enacted to overrule *Halisburton Oil Well Cementing Co. v. Walker*,³⁷ which rejected means-plus-function claims.³⁸ The Court stated that the reference to "equivalents" in that provision was "no more than a prophylactic against potential side effects of that cure and that such limited congressional action should not be overread for negative implications."³⁹ The Court concluded that "[a]bsent something more compelling than the dubious negative inference offered by petitioner, the lengthy history of the doctrine of equivalents strongly supports adherence to [the doctrine]."⁴⁰

The following section attempts to provide support for the Court's decision with legal and historical arguments that, instead of being an "anomaly"⁴¹ in patent infringement inquiry, the doctrine of equivalents is in fact an integral part of the inquiry.

34. *Warner-Jenkinson Co., Inc. v. Hilton Davis Chemical Co.*, ___ U.S. ___, 117 S. Ct. 1040, 1050, 41 U.S.P.Q.2d (BNA), 1865, 1873 (1997).

35. *Id.* at 1051, 41 U.S.P.Q. at 1869-70.

36. 35 U.S.C. § 112, ¶ 6 (1994) ("An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts described in the specification and equivalents thereof.").

37. 329 U.S. 1, 71 U.S.P.Q. (BNA) 175 (1946).

38. For means-plus-function claim and the argument that it invalidates the doctrine of equivalents, see *supra* note 15.

39. *Warner-Jenkinson*, 117 S. Ct. at 1048, 41 U.S.P.Q.2d at 1871.

40. *Id.* at 1048-49, 41 U.S.P.Q.2d at 1871.

41. See *Royal Typewriter Co. v. Remington Rand, Inc.*, 168 F.2d 691, 691, 77 U.S.P.Q. 517, 518 (2nd. Cir. 1948) ("No doubt, [the doctrine of equivalents] is, strictly speaking, an anomaly; but it is one which courts have frankly faced and accepted almost from the beginning.").

A. Equivalency as the Conceptual Center of Infringement Inquiry

1. *Equivalency Was the Soul of Infringement Analysis*

It has been widely noted that prior to the Patent Act of 1836 the patent infringement inquiry was a test of equivalency.⁴² Infringement in that era was judged by a "substantial similarity" standard.⁴³ Reminiscent of the modern function-way-result test, the test for infringement then was "whether the given effect [was] produced substantially by the same mode of operation, and the same combination of powers."⁴⁴

After the Patent Act of 1836, applicants were required to "particularly" point out and "distinctly" claim their inventions.⁴⁵ By enacting such a requirement, the legislature intended to combat then-rampant patent frauds, including fraud by "slight immaterial alterations."⁴⁶ Hence, it is improbable that Congress, by requiring specified description, intended to eliminate the equivalency approach in patent infringement inquiry because the essence of that doctrine is to prevent evasion of patent infringement claims through the device of mere colorable changes.

The requirement for detailed specification, however, created the impression that the patented invention was only what the inventor specified or claimed. It was under these circumstances that the Supreme Court created the doctrine of equivalents in *Winans*.

42. For historical development of the doctrine of equivalents in general, see DONALD S. CHISUM, UNDERSTANDING INTELLECTUAL PROPERTY LAW, § 2B (1992); MERGES, *supra* note 1, at 917-18.

43. See *Lowell v. Lewis*, 15 F. Cas. 1018, 1021 (C.C.C. Mass. 1817) (Story, J., charging the jury) (stating that infringement judgement constituted the sole factual inquiry on whether the patented and accused machines were "substantially the same invention").

44. See *Odiorne v. Winkley*, 2 Gall. 51, 18 F. Cas. 581, 582 (C.C.D. Mass. 1814) (Story, J., charging the jury) ("Mere colorable differences, or slight improvements, cannot shake the right of the original inventor.").

45. See 35 U.S.C. § 112, ¶ 2 (1994). Similar language was first promulgated in the Patent Act of 1836, ch. 357, 5 STAT. 117, 119 (1836) ("[and the applicant must] particularly specify and point out the part, improvement, or combination, which he claims as his own invention or discovery."). It later was changed to "particularly point out and distinctively claim the part, improvement, or combination which he claims as his invention or discovery." Patent Act of 1870, ch. 230, 16 STAT. 198, 201 (1870).

46. See S. REP. NO. 338 (April 28, 1836) (stating that by requiring specific description of invention and bringing back patent examination for novelty Congress intended to combat four evils: (1) worthless and void patents; (2) infringement of the right of public and bona fide patentees by patent fraud; (3) alarming number of lawsuits because of (1) and (2); (4) patent fraud by slight immaterial alterations).

2. *Winans Preserved Instead of Created the Equivalency Approach*

The *Winans* Court justified its decision no differently than the pre-1836 legal analyses based on equivalency.⁴⁷ The Court noticed that an express provision in the 1793 Act, which stipulated that a patent can not be granted merely for a change of form, was not preserved in the 1836 Act.⁴⁸ But the Court held that this principle was a declaratory clause in the 1793 Act and should be an implicit part of every patent system.⁴⁹

It is remarkable that the *Winans* Court did not even mention how the requirement by the 1836 Act to “particularly specify and point out” the invention impacted its decision. The Court’s seemingly unremarkable rationale based on traditional “equivalency” analysis contrasts sharply with the widely-accepted view that the Court made a landmark decision that took patent scope outside the literal language of the claim. This indicates that the *Winans* Court did not believe that the 1836 Patent Act made any conceptual difference in the “equivalency” approach in an infringement suit. Thus, in contrast to the conventional wisdom that the doctrine is an “anomaly,” the Supreme Court treated it as the basic fabric of the infringement inquiry from its inception.

3. *Graver Tank: Continuation of the Equivalency Inquiry*

Graver Tank did not depart in principle from the *Winans* framework. The Court there stated that, “[i]f accused matter falls clearly within the claim, infringement is made out and that is the end of it.”⁵⁰ The question is, however, how to determine whether “the accused matter falls clearly within the claim.” There is no evidence that the Court meant that the issue should be decided completely by the literal language of the claim. On the contrary, the Court cited with approval *Westinghouse*⁵¹ in which the fact that claim language clearly read on the accused device did not end the in-

47. *Winans v. Denmead*, 56 U.S. 330, 341 (1853) (“It is generally true ... a patentee ... is understood to intend to claim, and does by law actually cover, not only the precise forms he has described, but all other forms which embody his invention.”).

48. *Id.*

49. *Id.* (“[T]hough this declaratory law was not reenacted in the Patent Act of 1836, it is a principle which necessarily makes part of every system of law granting patents for new inventions.”).

50. *Graver Tank & Mfg. Co. v. Linde Air Products Co.*, 339 U.S. 605, 85 U.S.P.Q. (BNA) 328 (1950).

51. *Boyden Power-Brake Co. v. Westinghouse*, 170 U.S. 537 (1898) (finding that Boyden’s improvement on Westinghouse’s patented train brake was literally covered by the patent, but nonetheless did not infringe because the improvement was a manifest departure from the principle of the Westinghouse patent).

quiry.⁵² So it seems that a more appropriate way of interpreting the Court's statement in *Graver Tank's* is that the inquiry of infringement comes to an end if the totality of the evidence, not just the patent's literal scope, indicates that the accused device falls within the claim.

4. Patent Claim as Prima Facie Definition of Patent Scope

The so-called "reverse doctrine of equivalents"⁵³ further supports the notion that an equivalency test is a basic component of infringement inquiry. Literal coverage of a device by a patent claim does not necessarily mean the accused device infringes if it is sufficiently different in principle from the disclosed one. This reverse application of the doctrine of equivalents illustrates that the ultimate nature of infringement inquiry is an inquiry of equivalency, or non-equivalency, between the patented and the accused devices.

Therefore, the equivalency inquiry in a patent infringement suit makes the patent claim a rebuttable presumption for patent scope. A matter literally falling outside a patent claim can still infringe the patent if it is substantially similar to the patented invention. In other words, the claim language of a patent, though not "a nose of wax,"⁵⁴ is not an ironclad definition of the patent coverage. It merely serves as a strong prima facie de-

52. *Graver Tank*, 339 U.S. at 609, 85 U.S.P.Q. at 330.

53. The leading Supreme Court case on reverse doctrine of equivalents is *Boyden Power-Brake Co. v. Westinghouse*, 170 U.S. 537 (1898). For modern application of the reverse doctrine by lower courts, see *Lessona Corp. v. United States*, 530 F.2d 896, 192 U.S.P.Q. (BNA) 672 (Ct. Cl. 1976) (finding no infringement despite the fact that the accused metal screen fit the claim language of "uniformly porous layer," because the pores on the accused screen had diameters larger than the range disclosed in the patent specification and because the pores in the accused screen performed the same function of the pores in the patented screen only in an incidental and insignificant way); *SRI Int'l v. Matsushita Elec. Corp. of Am.*, 775 F.2d 1107, 227 U.S.P.Q. (BNA) 577 (Fed. Cir. 1985) (affirming the validity of the reverse doctrine of equivalents); *Scripps Clinic & Research Found. v. Genentech, Inc.*, 927 F.2d 1565, 18 U.S.P.Q.2d (BNA) 1001 (Fed. Cir. 1991) (reversing summary judgment of infringement on the ground that the much enhanced stability and reduced production cost warranted a trial to find whether the accused product had changed in principle); cf. *United States Steel Corp. v. Phillips Petroleum Co.*, 865 F.2d 1247, 9 U.S.P.Q.2d (BNA) 1461 (Fed. Cir. 1989) (rejecting a reverse equivalency defense based on the finding that the infringers made no change in principle). Like the doctrine of equivalents, the reverse doctrine of equivalents is sometimes tagged as an "equitable" doctrine. See, e.g., *Scripps*, 972 F.2d at 1581, 18 U.S.P.Q.2d at 1003. There is no clear evidence, however, that it is an equity rule exercisable only by judges in exceptional cases.

54. *White v. Dunbar*, 119 U.S. 47, 51 (1886) ("Some persons seem to suppose that a claim in a patent is like a nose of wax, which may be turned and twisted in any direction")

scription of the scope of the patent, which can be rebutted by other evidence in the quest for equivalency.

B. The Demise of the Equity View of the Doctrine of Equivalents

The notion that patent claim is only a rebuttable presumption for patent scope has always been dogged by the counter argument that the doctrine of equivalents is merely an equitable doctrine. Under the equity view, the doctrine is an exception to the rigid law that patent claim is the scope of the patent. This equity view was bolstered by two arguments. One is the anti-fraud policy⁵⁵ stated by *Graver Tank*⁵⁶; the other is the peripheral claiming method.⁵⁷

Warner-Jenkinson in essence dismissed both of the arguments for the equity view of the doctrine of equivalents. The Court affirmed the Federal Circuit's holding that the infringer's intent is irrelevant as to whether the doctrine of equivalents applies.⁵⁸ The Court also affirmed jury's role in determining equivalency.⁵⁹ Moreover, the Court dismissed the importance of the peripheral claiming method.⁶⁰ The Court's rulings have effectively quelled the "equity" view of the doctrine of equivalents.

The demise of the equity view not only lends support to the notion that the claim acts as the prima facie patent scope, it also has a significant implication for the status of the reverse doctrine of equivalents. Despite the fact that *Graver Tank* treated the reverse doctrine of equivalents as just one application of the doctrine of equivalents,⁶¹ the application of the re-

55. See *Graver Tank*, 339 U.S. at 607, 85 U.S.P.Q. at 330.

56. It is argued that based on the policy the doctrine of equivalents should be an equity tool for the judges to defeat intentional fraud by immaterial changes that take the accused device outside claim language. See *supra* notes 21-22.

57. For an explanation of the peripheral claiming, see *supra* note 17. For arguments that peripheral claiming precludes application of the doctrine of equivalents, see *supra* note 18.

58. *Warner-Jenkinson Co., Inc. v. Hilton Davis Chemical Co.*, ___ U.S. ___, 117 S. Ct. 1040, 1051, 41 U.S.P.Q.2d (BNA), 1865, 1873 (1997).

59. See *id.* at 1053, 41 U.S.P.Q.2d at 1874.

60. *Id.* at 1047 fn.4, 41 U.S.P.Q.2d at 1876 fn.4 ("The suggested change in claiming practice predates *Graver Tank*, is not of statutory origin, and seems merely to reflect narrower inventions in more crowded arts. Also, judicial recognition of so-called 'pioneer' patents suggests that the abandonment of 'central' claiming may be overstated.")

61. See *Graver Tank*, 339 U.S. at 608-09, 85 U.S.P.Q. at 330 ("[W]here a device is so far changed in principle from a patented article ... but nevertheless falls within the literal words of the claim, doctrine of equivalents may be used to restrict the claim and defeat the patentee's action for infringement.")

verse doctrine has been severely limited partially by the equity view.⁶² Thus removing the "equity" shroud from the doctrine of equivalents can potentially lead to an expansion of the utility of the reverse doctrine of equivalents.⁶³ If this turns out to be true, the reverse doctrine of equivalents can be expected to become a routine defense in infringement cases, just as the doctrine of equivalents has arguably become the "second bite at the apple" for patentees.

In sum, the Supreme Court has consistently regarded the issue of equivalency as an inherent part of the infringement inquiry, despite the statutory language changes in the Patent Act. At least, the Court has never expressed opinions to the contrary. The *Warner-Jenkinson* Court followed this legal tradition in rejecting the arguments against the validity of the doctrine of equivalents. However, as discussed in the next section, *Warner-Jenkinson* has delimited the application of the doctrine by enhancing the force of the prosecution history estoppel defense.⁶⁴

IV. PROSECUTION HISTORY ESTOPPEL: THE NEW REBUTTABLE PRESUMPTION

The old rule on prosecution estoppel was that the defendant could invoke the estoppel defense only if the prosecution history showed that the concession of the subject matter was made to distinguish prior art.⁶⁵ The peculiar problem of *Warner-Jenkinson* was that even though it was clear that the upper limit, pH 9, was added to distinguish the prior art, there was no evidence as to why the lower limit, pH 6, was added.⁶⁶ In deciding this issue, the Court held that, in a situation where no reason can be found in

62. The reverse doctrine of equivalents at present time is rarely applied. See *Ethyl Molded Prods. Co. v. Betts Package, Inc.*, 9 U.S.P.Q.2d 1001, 1026 (E.D. Ky. 1988) ("The reverse doctrine of equivalents, although frequently argued by infringers, has never been applied by the Federal Circuit.").

63. For an economic defense of the reverse doctrine of equivalents, see MERGES, *supra* note 1, at 943-49.

64. Prosecution history of a patent is the interchanges between the patentee and the PTO that are recorded in the file wrapper as part of the patent's public file. Prosecution history estoppel is an affirmative defense where the alleged infringer claims to have concluded that a particular subject matter is not covered by the patent by relying on the record in the prosecution history that the patentee surrendered the subject matter in an amendment to avoid rejection.

65. The rationale for the rule is, (1) the surrendered subject matter presumably is part of the prior art if its concession was necessary to avoid the prior art, and (2) the doctrine of equivalents can not cover prior art. For the prior art limitation on the doctrine of equivalents, see *supra* note 12.

66. *Warner-Jenkinson*, 117 S. Ct. at 1051, 41 U.S.P.Q.2d at 1868.

the file wrapper for a claim amendment during prosecution, the amendment is presumed to have been made to distinguish prior art.⁶⁷ The burden of rebutting the presumption is on the patentee.⁶⁸ The Court rested its decision on a policy ground that "claims do indeed serve both a definitional and a notice function."⁶⁹ The Court reasoned that a patent-holder should be estopped from reclaiming something he consciously surrendered unless he can establish that the concession was not made to avoid unpatentability based on prior art.

1. The New Rule Creates a New Species of Defense

On the surface the Court's holding does not depart significantly from the previous rules on prosecution history estoppel. After all, the new burden of proof on the patentee does not seem to be onerous because in an infringement suit the patentee has the ultimate burden of proof anyway. This comment, however, argues that the new rule in fact represents a significant change from the previous case law.

The new-mint judicial presumption produces a new species of defense that is no longer a true estoppel. Estoppel is an affirmative defense⁷⁰ for which the defendant has the burden of proving the requisite elements, which are reasonable reliance and change of position.⁷¹ To be sure, the Court affirmed the basic rule that a subject matter surrendered during prosecution becomes irretrievable by the doctrine of equivalents only when the concession was made to distinguish prior art.⁷² Under this basic rule, an alleged infringer should not be able to claim a reasonable reliance simply because the subject matter in question was surrendered in response to a rejection, because there are many kinds of rejections that are not based on prior art.⁷³ Furthermore, from the vantage point of the alleged infringer, under the new rule he no longer has a complete estoppel defense

67. *Id.*

68. *Id.*

69. *Id.*; 41 U.S.P.Q.2d at 1873.

70. See FED. R. CIV. P. 8(c).

71. The party claiming the estoppel must have relied on its adversary's conduct in such a manner as to change his position for the worse. The reliance must have been reasonable in that the party claiming the estoppel did not know or should not have known that its adversary's conduct was misleading. See, e.g., *Wilber National Bank v. United States*, 294 U.S. 120, 124-125, 55 S.Ct. 362, 364, 79 L.Ed. 798 (1935).

72. See *Warner-Jenkinson*, 117 S. Ct. at 1050, 41 U.S.P.Q.2d at 1871-72 ("[W]e see no substantial cause for requiring a more rigid rule invoking an estoppel regardless of the reasons for a change.").

73. For non-art based rejections, see THE MANUAL OF PATENT EXAMINATION PROCEEDINGS, § 706.03 (a)-(z).

anymore, even if he does have reasonable reliance, because the patentee can produce off-the-record evidence to nullify his estoppel defense.

2. *Can the New Rule Enhance Notice Function of Patent Claim?*

It is questionable whether the new rule would indeed enhance the notice function of a patent claim as the Court reasoned. Under the new rule, if an improver cannot find a reason for a concession in the file wrapper, he can assume that the conceded subject matter falls outside of the reach of the doctrine of equivalents. But he can still be found to infringe the patent if the patentee produces evidence that the concession was made for reasons not related to prior art.⁷⁴ Hence, the new rule does not help improvers very much, because they still face essentially the same degree of uncertainties in balancing the risk of infringement versus the benefit of improvement.

Concededly, the new rule helps alleged infringers when litigation arises because the patentee will lose if he cannot find a documented reason for the claim amendment. This help, however, hardly enhances the notice function of the patent claim.

Furthermore, the sudden change of rules will likely throw many patentees off balance because of inadequate past record keeping.⁷⁵ It will further increase the burden of future record keeping for the patentee. Thus, as this comment argues, the Supreme Court's new rebuttable presumption represents an unnecessary change of law, the cost of which will likely outweigh the benefit for the society as a whole.

V. THE TESTS FOR EQUIVALENCY

In dealing with the controversies surrounding legal tests for equivalency, the Court addressed three issues: (1) Whether the equivalency inquiry should focus on individual elements or the invention as a whole;⁷⁶ (2) whether the determination of interchangeability of elements of the accused and patented devices should be decided at the time of patent or at the time of infringement;⁷⁷ and (3) whether the test should be the function-way-result or the insubstantiality test.⁷⁸

74. There is ample possibility that a rejection was not based on the prior art.

75. See, e.g., *Warner-Jenkinson*, 117 S. Ct. at 1054, 41 U.S.P.Q.2d at 1876 (Ginsberg, J. concurring) (“[Y]ears after the fact, the patentee may find it difficult to establish an evidentiary basis that would overcome the new presumption.”).

76. *Id.* at 1049, 41 U.S.P.Q. at 1871.

77. *Id.* at 1052-53, 41 U.S.P.Q. at 1874.

78. *Id.* at 1954, 41 U.S.P.Q. at 1875.

A. Equivalency of Elements

The Court endorsed the late Judge Nies' proposal that the test of equivalency applies only to "the equivalency of an element or part of the invention with one that is substituted in the accused product or process."⁷⁹ It quoted with approval her argument that testing the equivalency of patents as a whole inevitably enlarges the scope of patent while testing equivalency of elements does not.⁸⁰

On the surface, the element equivalency approach would make the outcome of the doctrine of equivalents more limited and more predictable. There are, however, potential problems in implementing such a rule. The first problem is the vague definition of elements.⁸¹ The inquiry could turn too much on the language of claim drafting.⁸² Thus, for infringement litigation, the element-by-element approach will have a long way to go before the case-by-case doctrinal evolution delineates its contours of application.⁸³ For patent applicants, however, the endorsement by the Supreme Court of the element rule makes it very clear that they should draft their claims in the most integrated possible way so that the least number of elements can be extracted from the claim language. In this way, each element contains a relatively higher level of functionality and therefore has a larger ambit of equivalency.⁸⁴

79. *Hilton Davis Chemical Co. v. Warner-Jenkinson Co., Inc.*, 62 F.3d 1512, 1573, 35 U.S.P.Q.2d (BNA) 1641, 1692 (Fed. Cir. 1995) (Nies, J., dissenting).

80. *See Warner-Jenkinson*, 117 S. Ct. at 1049, 41 U.S.P.Q.2d at 1871.

81. *See, e.g., MERGES, supra note 1*, at 867-68 (summarizing three definitions of elements).

82. *See, e.g., CHISUM, supra note 42*, at 2-261 (arguing with two hypothetical tile claims that an element-by-element approach could potentially yield a different outcome for different claim drafting of the same invention).

83. This includes, *inter alia*, developing consistent ways of extracting and comparing elements, which are no simple tasks. *See, e.g., Pennwalt Corp. v. Durand-Wayland, Inc.*, 833 F.2d 931, 4 U.S.P.Q.2d (BNA) 1737 (Fed. Cir. 1987), *cert. denied*, 485 U.S. 961 (1988); *cf. Corning Glass Works v. Sumitomo Electric U.S.A., Inc.*, 868 F.2d 1251, 9 U.S.P.Q.2d 1962 (Fed. Cir. 1989).

84. Take *Chisum's* hypothetical tile claims as an example.

Claim 1 is for 'A floor tile comprising a regular four-sided polygon with each side of approximately equal length.' Claim 2 is for: 'A floor tile comprising (a) a first side, (b) a second side, a first end of said second side joined at a first end of said first side, (c) a third side, a first end of said third side joined at a second end of said first side, and (d) a fourth side joined at a second end of said second side and a second end of said third side, wherein each of said sides are of approximately equal length.'

CHISUM, supra note 42. Claim 2 will have a much harder time to find equivalent if a court takes each side claim as an element.

The second problem is associated with the potential misuse or abuse of the element-to-element equivalency rule. This rule's emphasis on elements could possibly lead some lower courts to forget about the basic tenor of the doctrine of equivalents: that is, equivalency of elements must be determined in the context of the whole invention.⁸⁵ For example, the question of whether manganese is equivalent to magnesium or other alkaline earth metals can only be estimated by their functions in the invention as a whole. In many chemical processes, they are not equivalents.⁸⁶ Only when viewed as silicate salts and used as welding flux components can they be called equivalent, as in *Graver Tank*.⁸⁷ Therefore, precisely speaking, the ostensible inquiry into the equivalency of elements should be described as an inquiry into whether the accused device is equivalent to the patented invention as a whole, despite differences in the element in question. Hence, for the purpose of the doctrine of equivalents, it is not dispositive whether two elements or components are equivalent or different in isolation. Their equivalency is determined by the totality of the situation. The Federal Circuit now has the power and the duty to ensure correct applications of the element equivalency rule.

B. After-arising Art

The issue of whether interchangeability should be tested at the time of patent issuance or at the time of infringement boils down to the issue of whether equivalents should include after-arising art that becomes available after the patent grant. The Court agreed with the Federal Circuit that equivalency should be decided by the knowledge of skillful artisans at the time of infringement and therefore could include after-arising art.⁸⁸ The Court rested its decision on the ground that, like the reasonable person standard, the equivalency inquiry based on the knowledge of a skillful

85. See, e.g., *Graver Tank & Mfg. Co. v. Linde Air Products Co.*, 339 U.S. 605, 609, 85 U.S.P.Q. (BNA) 328, 330-31 (1950) ("What constitutes equivalency must be determined against the context of the patent, the prior art, and the particular circumstances of the case 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.") The *Warner-Jenkinson* Court also expressed a similar opinion. 117 S. Ct. at 1054, 41 U.S.P.Q.2d at 1875 ("An analysis of the role played by each element in the context of the specific patent claim will thus inform the inquiry as to whether a substitute element matches the function, way, and result of the claimed element").

86. For example, magnesium cannot equivalently substitute for manganese in manganese steel, while manganese cannot substitute for magnesium in enzymatic reactions requiring magnesium as a catalyst.

87. *Graver Tank*, 339 U.S. at 611-12, 85 U.S.P.Q. at 331.

88. See *Warner-Jenkinson*, 117 S. Ct. at 1052-53, 41 U.S.P.Q.2d at 1874.

practitioner is an objective inquiry.⁸⁹ Thus a skilled practitioner's knowledge is not relevant for its own sake, but rather for what it tells the fact-finder about the similarities or differences between those elements.

The Court's argument seems to beg the question of why the fact-finder should not listen to a person who was skillful in the art at the time of the invention, because the reasonable person standard is a qualified objective standard that takes account of time and circumstances.⁹⁰ The question here is whether the scope of the patent should include certain elements. The relevant time frame, if analogized to the reasonable person standard, would apparently be the time of the patent scope being created.⁹¹

Nonetheless, the Court's rule is probably sound. The rationale for its decision appears to lie in the general practice of patent scope interpretation. The scope of a patent is interpreted on the basis of technology at the time of infringement, but not at the time of patent.⁹² Because a thing equivalent "is the same as the thing itself,"⁹³ there is little reason to determine equivalents at a different time from the determination of literal scope. If the literal scope can include after-arising art, so should equivalency.⁹⁴

Moreover, there seem to be good policy reasons for the Court's rule. One of the major risks a patentee faces is that a minor equivalent replacement, made possible by later technological development, takes an accused device out of the literal scope of the patent. These risks are very difficult

89. *See id.*

90. For example, in a negligence case, the question is whether the defendant's alleged negligent conduct is something a reasonably prudent person would do in the defendant's situation at the time of the incidence in question. Therefore, if the event happened five years ago, the relevant question is what a reasonable person would have done five years ago under the same circumstance.

91. To be sure, the Patent Act uses the concept of the skilled practitioner to test enablement at the time of application. 35 U.S.C. § 112 (1994) ("The specification shall contain a written description of the invention ... in such full, clear, concise, and exact terms as to enable any person skilled in the art ... to make and use the same").

92. The claim language describing a technology could include different things at different times. The question is always whether the claim reads on the accused device at the time of infringement regardless of whether the accused device is made possible by after-arising art. For infringement in general, see *MERGES*, *supra* note 1, at 825.

93. *Warner-Jenkinson*, 117 S. Ct. at 1051, 41 U.S.P.Q.2d at 1873 (citing with approval *Machine Co. v. Murphy*, 97 U.S. 120, 125 (1877)).

94. In fact, in its first case that validates the concept that the scope of equivalency includes after-arising art, the Federal Circuit cited as authority its predecessor court's opinion on literal scope coverage of after-arising art. *See Hughes Aircraft Co. v. United States*, 717 F.2d 1351, 1365, 219 U.S.P.Q. (BNA) 473, 483 (Fed. Cir. 1983) (citing cases by the Court of Claims regarding literal scope coverage of partial variation in technique).

to minimize because the technical development involved is unknown and unpredictable at the time of patent application, and they usually happen in other fields. The risks could potentially work a great injustice on the patentee if the doctrine of equivalents does not allow for after-arising art. The risks could also deter research and development investment.

C. Linguistic Framework

The Court refused to referee the debate on whether the insubstantiality or the function-way-result test should be used to determine equivalency. The Court held that different linguistic frameworks might be desirable in different cases.⁹⁵ The crucial point, the Court ruled, is whether the test is probative of the equivalency of the elements in the accused and patented products.⁹⁶ This holding will probably not help the lower courts much in conducting the equivalency test. The Court has left further development of the test to the Federal Circuit.⁹⁷

This comment attempts to contribute somewhat to the ongoing discourse on the equivalency test. It postulates here that the function-way-result test is still a viable test suited for all patents and that the problem associated with the test arises from the way it has been applied.

1. *A Prerequisite for the Function-Way-Result Test*

The problem of the function-way-result test is adequately illustrated by Judge Lourie's chemical compounds hypothetical. He posited that two chemicals have totally different structures and yet perform the same function in the same way and obtain the same result. They are two different things and yet they are equivalents under the function-way-result test.⁹⁸

This hypothetical illustrates the need for a prerequisite for applying the test in situations where structure or composition is the material part of the invention. Under these circumstances, the first step should be to ascertain whether there is only a minor difference in structure or compositions be-

95. *Warner-Jenkinson*, 117 S. Ct. at 1954, 41 U.S.P.Q.2d at 1875.

96. *See id.*

97. *See id.* at 1954, U.S.P.Q.2d at 1875-76 ("We expect that the Federal Circuit will refine the formulation of the test for equivalence in the orderly course of case-by-case determinations, and we leave such refinement to that court's sound judgment in this area of its special expertise.")

98. *Hilton Davis Chemical Co. v. Warner-Jenkinson Co., Inc.*, 62 F.3d 1512, 1546, 35 U.S.P.Q.2d (BNA) 1641, 1669 (Fed. Cir. 1995) ("Except for process inventions, which perforce must be defined by their component procedural steps, inventions are generally defined by structure, i.e., by what they are, rather than by what they do. [The function-way-result test] is most useful in defining what an invention does, but it does not always tell what an invention is.")

tween the accused and patented devices. If the two things are very different in their composition or structure, they are two different things regardless of whether they perform the same function in the same way to obtain the same result. In a sense, this principle existed since *Winans*, which stated, "Where form and substance are inseparable, it is enough to look at the form only."⁹⁹ For chemical or composition patents, structure and compositions are "forms" but they are also the very substance invented. Anything that substantially deviates from the patented structure or composition becomes a different thing irrespective of functional similarities.

Even in *Graver Tank*, the Court did not draw its conclusion solely based on the function-way-result test. In its factual inquiry of equivalency, *Graver Tank* first found that the accused product was similar to the claimed invention, except that the accused product substituted silicates of calcium and manganese for silicates of calcium and magnesium.¹⁰⁰ The Court noted that "[i]n all other aspects, the two compositions are alike." It was after this conclusion of similar composition that the Court made the function-way-result inquiry.¹⁰¹

Therefore, before any function-way-result analysis, the first step of the equivalency inquiry should be an examination of the overall differences between the accused and claimed device to determine whether they are insignificant. If this inquiry leads to the conclusion that the accused and patented devices are substantially different in structure or composition, the function-way-result test should not be used. On the other hand, if the structure or composition of the two devices is not substantially different, then the function-way-result test should be applied.

99. *Winans v. Denmead*, 56 U.S. 330, 343 (1853).

100. 339 U.S. 695, 609, 85 U.S.P.Q. (BNA) 328, 331 (1950)

101. In *Graver Tank*, although manganese silicate was a major component in the accused composition, the specification of the patent reveals that many metal silicates including manganese silicate could be used although the preferred embodiment was alkaline earth metal silicates. The patent stated: "We have used calcium silicate and silicates of sodium, barium, iron, *manganese*, cobalt, magnesium, nickel and aluminum, both in binary and ternary combinations, in various proportions." (emphasis added) The patentee actually claimed all metal silicate, which was held invalid because not all silicates have such utility. Nevertheless, the major component of the invention was silicate, which worked with many metal element combinations including manganese. Therefore substituting manganese was indeed a minor change in the patented composition. See *Linde Air Products Co. v. Graver Tank & Mfg. Co., Inc.*, 86 F. Supp. 191, 75 U.S.P.Q. 231 (N.D. Ind. 1947). The dissent in *Graver Tank* erroneously focused on the weight composition of silicate manganese. See *Graver Tank*, 339 U.S. at 613, 85 U.S.P.Q. at 332.

2. *The Function-Way-Result Test as Check and Balance for the Doctrine of Equivalents*

Under the two-step analysis stated above, the function-way-result test plays two principal roles in the equivalency test. First, it serves to confirm an insubstantial difference found by examining the structures or compositions, and in borderline cases, provides additional comparative criteria. The second, perhaps more important, role of the test is to act as a check against overuse of the doctrine of equivalents in cases where two structurally similar things may have significantly different functionality. When the accused device differs only slightly from the claimed device in structure or composition, they are not necessarily equivalent. Minor changes in structure and composition can sometimes result in substantial improvement of the function the device performs, or the way it performs such a function, or the result it obtains. Thus to ask the function-way-result question under this circumstance is to ascertain whether the minor changes in structure or composition made any significant changes in the function, way, or result. An affirmative answer may take the accused device outside of the scope of the patent in spite of the minor differences in structure or composition. A negative answer, on the other hand, supports the inference that there is no substantial difference between the two devices.

Hence, the function-way-result test is not an obsolete test unsuited for chemical or biotech patents. Rather, misuse of the test has caused confusion. For example, in Judge Lourie's hypothetical about the two structurally different but functionally similar chemicals, the correct approach to the question of equivalency ought to begin with their structural differences and end there. A nonequivalency conclusion is merited solely based on the substantial difference between the structures of the two chemicals. It is irrelevant that they perform the identical function in the identical way to obtain the identical result. They are different things because their structures are substantially dissimilar, and structure is a material part of a chemical patent.

VI. CONCLUSION

The Supreme Court reaffirmed the vitality of the doctrine of equivalents, rejecting the argument that it is an equitable doctrine exercisable only by judges in extraordinary circumstances. This comment has argued in favor of the ruling by contending that the conceptual center of an infringement inquiry is an inquiry of equivalency. It also postulates that abolishment of the "equity" restriction on the doctrine would enable broader application of the reverse doctrine of equivalents.

The Court, however, delimited the application of the doctrine of equivalents. It endorsed the element-by-element approach for the equivalency test. It also created a judicial presumption that any concession of subject matter during patent prosecution is irretrievable by the doctrine of equivalents unless the patentee can prove that the concession was not made to distinguish prior art. This comment has suggested some areas of caution and some further refinements, in light of the Court's decision. Arguably, the new burden of production on the patentee will not achieve the Court's intended policy goal of enhancing the notice function of patent claim. Also, the element-by-element approach may be prone to misapplication and should be closely monitored by the Federal Circuit. Finally, courts should use a two-step equivalency inquiry combining an insubstantiality test for structure or composition and the function-way-result analysis.