

THE JUDICIAL DOCTRINE OF EQUIVALENTS

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I. INTRODUCTION

This Article argues that the doctrine of equivalents (“DOE”) evolved gradually as judge-made law and remains subject to both historical constraints and modern judicial discretion. The argument begins with the proposition that judges have been formulating and modifying the doctrine of equivalents since the earliest patent infringement cases to ensure that inconsequential differences between a patented device and an infringing device do not foreclose a successful patent challenge. As a result, judges retain the power to reform the doctrine as they see fit; indeed, the Federal Circuit’s recent decision to expand prosecution history estoppel substantially blocked the use of the doctrine. Nonetheless, the evolutionary history of the doctrine and the strength of prevailing judicial conservatism make it unlikely that radical reforms can survive review by the Supreme Court.

Judges have wide latitude in almost any patent suit to foreclose the doctrine of equivalents as a matter of law, thus preventing juries from applying the doctrine of equivalents to find infringement. This discretion can operate through several mechanisms, including function-way-result analysis,¹ prosecution history estoppel,² and the all-elements rule.³ Judges can also foreclose the doctrine of equivalents through their application of other areas of patent law, such as claim construction.⁴ Until a recent decision by the Supreme Court, it appeared that this discretion even permitted judges to impose absolute foreclosure. Now, it appears that absolute foreclosure is inappropriate, and we can thus infer a limit on the judicial power to reform the doctrine.

This Article examines the doctrine of equivalents from both a historical and an empirical context. The historical component discusses key Supreme Court opinions that have shaped the doctrine

1. Function-way-result, sometimes written as “function/way/result,” is a label applied to a judicial analysis considering whether an accused infringing device has substantially the same function and operates in substantially the same way to achieve the same result as the patented device.

2. Prosecution history estoppel, also termed “file-wrapper estoppel,” is “the doctrine preventing a patentholder from invoking the doctrine of equivalents if the holder, during the application process, surrendered certain claims or interpretations of the invention.” BLACK’S LAW DICTIONARY (7th ed. 1999).

3. See *Unique Concepts, Inc. v. Brown*, 939 F.2d 1558 (Fed. Cir. 1991) (describing the all-elements rule as requiring that “to prove infringement, every element in the claim must be found in the accused device either literally or equivalently”).

4. Simply put, claim construction describes the process of defining the scope and meaning of a patent. The doctrine of claim construction is quite complex, interpreted using the “broadest reasonable interpretation” of a claim during patent prosecution, but interpreted using “[v]ery different rules” during patent enforcement. 1 PAT. L. FUNDAMENTALS § 2:34 (John Gladstone Mills, III, et al., eds., 2d. ed. 2003).

of equivalents. The analysis of these cases raises a historical challenge to the widely-held belief that the doctrine of equivalents was created by a single Supreme Court case. The importance of the distinction lies in the degree of subsequent malleability resulting from gradual judicial formulation, as opposed to sudden judicial creation. A judicial doctrine that gradually evolves may evolve further in a similar fashion. On the other hand, a judicial doctrine created abruptly may arguably be a more legitimate subject for further sudden changes by the judiciary. Empirically, this Article also tests the ability of the judiciary to assert absolute control over the availability of equivalents analysis, specifically, within a time frame defined by dates of recent significance in the long-running *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.* litigation.⁵

5. The nomenclature used in this paper follows that used in an article by R. Polk Wagner, whose summary of the *Festo* case history is below:

In 1994, the U.S. District Court for the District of Massachusetts ruled in favor of Festo Corporation on the basis of both summary judgments and jury verdicts of infringement under the doctrine of equivalents, finding no prosecution history estoppel. *See Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.* (“*Festo I Judgment*”), No. 88-1814-PBS, slip op. at 2–3 (D. Mass. Oct. 27, 1994) (entering a jury verdict of infringement under the doctrine of equivalents); *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.* (“*Festo I Order*”), No. 88-1814-PBS, slip op. at 14–15 (D. Mass. July 11, 1994) (granting summary judgment of infringement under the doctrine of equivalents).

The District Court was initially affirmed by the Federal Circuit, *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.* (“*Festo II*”), 72 F.3d 857 (Fed. Cir. 1995), but that decision was vacated and remanded by the Supreme Court in light of the discussion of prosecution history estoppel in *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17 (1997). *Shoketsu Kinzoku Kogyo Kabushiki Co. v. Festo Corp.* (“*Festo III*”), 520 U.S. 1111 (1997).

Upon remand, a panel of the Federal Circuit again affirmed *Festo I*, declining to apply prosecution history estoppel. *See Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.* (“*Festo IV*”), 172 F.3d 1361 (Fed. Cir. 1999) (holding that prosecution history estoppel does not necessarily bar all equivalents). The Federal Circuit then granted a petition for rehearing en banc, vacating *Festo IV* and ordering new briefing directed to specific aspects of prosecution history estoppel. *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.* (“*Festo V*”), 187 F.3d 1381 (Fed. Cir. 1999) (en banc). The en banc majority opinion reversed the *Festo I* decisions on the basis of prosecution history estoppel, *see Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.* (“*Festo VI*”), 234 F.3d 558 (Fed. Cir. 2000) (en banc) (reversing *Festo I* on grounds that prosecution history estoppel prohibited infringement based on the doctrine of equivalents), and was subsequently vacated and remanded by the Supreme Court. *See Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, (“*Festo VII*”), 122 S. Ct. 1831 (2002) (defining circumstances where prosecution history estoppel will limit the application of equivalents).

R. Polk Wagner, *Reconsidering Estoppel: Patent Administration and the Failure of Festo*, 151 U. PA. L. REV. 159, 166 n.18 (2002).

The question of continued judicial malleability of the doctrine of equivalents is particularly important in light of the Supreme Court's decision in *Festo VII*. By repeatedly citing earlier language declaring that "[t]he responsibility for changing [the doctrine] rests with Congress," the Court appeared to take the position that the judicial power to amend the doctrine, even if judicially created, is almost nonexistent.⁶ Yet the Court also emphasized the continuing importance of protecting the "settled expectations of the inventing community."⁷ As the judicial power to amend the doctrine remains important to achieving this aim, understanding the extent of this judicial power will be crucial to future efforts to apply or reform the doctrine to maintain its utility.⁸

II. JUDICIAL FORMULATION

A. *Winans v. Denmead: The Perceived Beginning*

While the leading authorities on patent law mark *Winans v. Denmead*⁹ as the beginning of the doctrine of equivalents,¹⁰ the early history of the doctrine is actually one of judicial formulation and gradual modification in response to underlying changes in statutory patent law requirements and claiming practices. The typical approach to tracing the historical creation of the doctrine of equivalents begins

The Federal Circuit has since issued an order directing the parties to brief questions related to the rebuttable presumption announced by the Supreme Court in *Festo VII*. See *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 304 F.3d 1289 ("*Festo VIII*") (Fed. Cir. 2002) (en banc); see also *infra* note 86. Most recently, the Federal Circuit held that the rebuttable presumption was to be decided as a question of law. See *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.* ("*Festo IX*"), No. 95-1066, 344 F.3d 1359 (Fed. Cir. 2003) (en banc).

6. See *Festo VI*, 535 U.S. 722, 733, 739 (2002).

7. *Id.* at 739.

8. See, e.g., *Festo VI*, 535 U.S. at 575 (highlighting obstacles to settled expectations that exist because of the doctrine itself).

9. 56 U.S. 330 (1853).

10. See, e.g., *Graver Tank & Mfg. Co. v. Linde Air Prods. Co.*, 339 U.S. 605, 608 (1950) ("The doctrine of equivalents evolved in response to this experience. The essence of the doctrine is that one may not practice a fraud on a patent. Originating almost a century ago in the case of *Winans v. Denmead* . . ."); 1 DONALD S. CHISUM, CHISUM ON PATENTS OV-7 (2003) ("*Winans v. Denmead* (1853) established the doctrine of equivalents; a device that did not respond literally to the language of the patent claim would nevertheless infringe if it obtained the same result in the same way as the patented invention."); PRINCIPLES OF PATENT LAW: CASES AND MATERIALS 876 (Donald S. Chisum et al. eds., 2001) [hereinafter PRINCIPLES OF PATENT LAW] ("*Winans* was the first Supreme Court decision to use the doctrine of equivalents to extend patent protection beyond the literal language of a patent claim."); Glen P. Belvis, *An Analysis of the En Banc Decision in Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co. and the Doctrine of Equivalents*, 11 FED. CIR. B.J. 59, 62 ("In *Winans v. Denmead*, the Supreme Court ruled, for the first time, that infringement may be found even though the literal language of the patent was avoided.").

with *Winans*, a case where the Supreme Court found equivalence between an octagon and a circle. *Winans* is often cited as the first recorded opinion with language defending the existence of a legal principle that allows findings of non-literal infringement.¹¹ It does not explicitly use the term “doctrine of equivalents,”¹² although the degree to which the Court stretched the plain meaning of the patent language prompted a dissenting opinion questioning whether such a broad reading should be permissible.¹³

The suit was brought by Ross Winans, who had invented and patented a railway car designed to carry more coal than previous railway cars. The patent was obtained in 1847.¹⁴ The claim read as follows:

What I claim as my invention, and desire to secure by letters-patent is, making the body of a car for the transportation of coal, &c., in the form of a frustum of a cone, substantially as herein described, whereby the force exerted by the weight of the load presses equally in all directions, and does not tend to change the form thereof, so that every part resists its equal proportion, and by which also the lower part is so reduced as to pass down within the truck frame, and between the axles, to lower the centre of gravity of the load, without diminishing the capacity of the car as described.¹⁵

Winans also described the invention in greater detail elsewhere in the patent’s specification section:

The principle of my invention, by which I am enabled to obtain this important end, consists in making the body, or a portion thereof, conical, by which the area of the bottom is reduced, and the load exerts an equal strain on all parts, and which does not tend to change the form, but to exert an equal

11. See, e.g., *Festo VII*, 122 S. Ct. 1831, 1838 (2002) (“[t]he Court in *Winans v. Denmead* first adopted what has become the doctrine of equivalents. . . .”); *Church v. Chrysler Corp.*, 349 F.2d 506, 510 (6th Cir. 1965) (“This is what is known as the ‘doctrine of equivalents’, first announced in *Winans v. Denmead*. . . .”); *Barnett v. United States*, 6 Cl. Ct. 631, 661 (1984) (“The seminal genesis of the doctrine of equivalents, of course, was the 1853 case of *Winans v. Denmead*, where the Supreme Court first expanded the literal wording of a claim to capture an infringer.”). See also *supra* note 10.

12. See *Winans*, 56 U.S. 330 (1853).

13. See *id.* at 344 (Campbell, J., dissenting).

14. *Id.* at 330.

15. *Id.* at 331.

strain in the direction of the circle; at the same time this form presents the important advantage, by the reduced size of the lower part thereof, to extend down within the truck and between the axles, thereby lowering the centre of gravity of the load.¹⁶

Essentially, Winans invented a rail car designed to hold more coal. The invention achieved this goal by incorporating a conical design and thereby increasing the surface area upon which the load rested. Instead of having all of the weight pressing down on the bottom, as had been the case for the box-shaped rectilinear cars with flat bottoms, the rail car invented by Winans allowed more of the load weight to be distributed against the sides of the car. Rather than a rectangular floor and uniformly-sized rectangular horizontal cross-sections, the Winans car had a circular floor and circular horizontal cross-sections that decreased in area closer to the floor. As seen in the above excerpts of the patent, in describing the geometric shape of the car, Winans used only the phrase “frustum of a cone” in his claim.¹⁷ For further explication, he used the terms “conical” and “circle” in the above detailed description.¹⁸

The accused infringers, Adam, Edward, and Talbot Denmead, made octagonal pyramidal cars. The Denmeads replaced Winans’ cone and its associated circular cross-sections with a shape having octagonal cross-sections. Like Winans, the Denmeads also employed a design in which the horizontal cross-sections decreased in area closer to the bottom of the car; like the cone, the octagonal pyramid tapered in the manner of a funnel. As a result, the Denmeads were able to gain many of the same benefits conferred by using a conical shape. Witnesses for both the defendants and the plaintiff confirmed this analysis in their testimony before the lower court.¹⁹

The plaintiff applied this undisputed testimony to support his arguments before both the lower court and the Supreme Court. These arguments rested on two jury instructions that he had requested. First, “the court were asked to say to the jury ‘that what they had to look at was not simply whether, in form and circumstances, which may be more or less immaterial, that which had been done by the defendant varied from the specification of the plaintiff’s patent’”²⁰ Under the traditional analysis, the substance of this first request and its acceptance by the Supreme Court in *Winans* has had far-reaching

16. *Id.*

17. *Id.*

18. *Id.*

19. *See id.* at 333.

20. *Id.* at 334.

effects for patent law, warrants closer analysis, and represents the conception of the doctrine of equivalents.

Under this interpretation of *Winans*, the phrase “not simply whether” is Winans’ request to expand infringement analysis beyond the scope of literal infringement, on (borrowing from the language above) “the specification of the plaintiff’s patent.” The “form and circumstances” are another way of referring to the invention as described by the patent. Thus, Winans asked the lower court to instruct the jury to make considerations beyond whether the Denmeads had practiced the invention as described in the patent. This interpretation suggests that a considerable amount of ingenuity was embedded in this request. Literal patent scope, after all, seems a straightforward concept. An inventor describes his invention in detail and claims the invention,²¹ and the government grants a temporary monopoly to the invention, provided certain statutory requirements have been met. How then did Winans manage to convince the Court to look beyond this standard?

The answer, according to the traditional view, lies in Winans’ focus on the insubstantiality of differences between the invention as described in the patent and the design used by the Denmeads. Where only literal infringement is available, any differences, gross or inconsequential, defeat a charge of infringement. In the case of the Winans patent, under a literal infringement rubric, any deviation from a conical shape having circular cross-sections, certainly including Denmead’s pyramidal/octagonal construction, would defeat the patent. As the *Winans* majority put it:

It is generally true, when a patentee describes a machine, and then claims it as described, that he 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; it being a familiar rule that, to copy the principle or mode of operation described, is an infringement, although such copy should be totally unlike the original in form or proportions.²²

The traditional interpretation of the beginning of the doctrine of equivalents maintains that this language marks the departure from a patent system with only literal infringement. It is certainly true that the Supreme Court did not offer precedential support for the above

21. See 35 U.S.C. § 112 (2003). For the applicable statute at the time *Winans* was decided, see Patent Act, ch. 357, § 6, 5 Stat. 117, 119 (1836).

22. *Winans*, 56 U.S. at 342.

proposition in *Winans*, although it did reiterate the position later in the opinion, stating, “The exclusive right to the thing patented is not secured, if the public are at liberty to make substantial copies of it, varying its form or proportions.”²³ This latter excerpt has come to be a favorite quotation of modern Federal Circuit jurisprudence applying the doctrine of equivalents.²⁴ Examining the language, the justification for expanding infringement beyond the literal terms of the patent is found in the terms “embody,” “principle,” and “mode of operation.”²⁵ With these words, the Court draws attention away from the language of the patent. The language that the *Winans* Court uses to describe this analytical approach appears benign, a line of inquiry that follows literal infringement analysis as a matter of course.

Under this traditional view of *Winans* as the beginning of the doctrine of equivalents, critics argue that the doctrine creates too much ambiguity. These critics propose that nearly a century-and-a-half of wrestling with the contours of this doctrine have taught that the price of extending protection beyond the literal bounds of a patent has been layer upon layer of indeterminable ambiguity.²⁶ Under this view, the grant of equivalence between a circle and an octagon, a cone and a pyramid, now presents the judiciary with a Gordian knot of complicated infringement determinations.

B. Challenging the General Perception

As it turns out, counsel for *Winans* was not as clever or as novel as the traditional view suggests. An accurate historical picture of infringement reveals that the essence of the doctrine of equivalents has been present in patent infringement jurisprudence since the earliest recorded patent infringement cases. This is well illustrated by the history of function-way-result analysis, which requires that an accused infringing device have the same function and operate in the same way to achieve the same result as the patented device.²⁷

Today, function-way-result analysis is a fundamental component of infringement analysis under the doctrine of equivalents,²⁸ but its origins are grounded in generic patent infringement. Well before the putative creation of the doctrine of equivalents in *Winans*, courts were already using the principles underlying function-way-result analysis to

23. *Id.* at 343.

24. *See, e.g., Festo VI*, 234 F.3d 558, 615 (Fed. Cir. 2000) (Michel, J., dissenting); *Hilton Davis Chem. Co. v. Warner-Jenkinson Co.*, 62 F.3d 1512, 1565 (Fed. Cir. 1995) (Nies, J., dissenting), *rev'd*, 520 U.S. 17 (1997).

25. *Winans*, 56 U.S. at 342.

26. *See, e.g., Festo VI*, 234 F.3d at 571–75.

27. *See Graver Tank & Mfg. Co. v. Linde Air Prod. Co.*, 339 U.S. 605, 608 (1950).

28. *See id.*

determine whether a patent had been infringed.²⁹ Although there was no formal distinction between literal infringement and infringement by equivalence in these early patent cases, the infringement opinions used language unmistakably similar to modern equivalence standards.

In *Gray v. James*, decided in 1817, thirty-six years before the *Winans* decision, the Circuit Court of Pennsylvania laid out a rule stating that “where the machines are substantially the same, and operate in the same manner, to produce the same result, they must be in principle the same.”³⁰ In *Gray*, the court found infringement of a competitor’s nail-making device, despite the fact that literal infringement did not exist.³¹ Thus, *Winans* did not mark the first time that courts supported the concept of non-literal infringement using such terms as “substantially the same,” “same manner,” and “same result” in the analysis.³² Nor did the *Winans* opinion end the use of the function-way-result analysis in infringement cases. The phrase “substantially the same function in substantially the same way to obtain the same result,” a modification of the language used in the *Gray* opinion, first appeared in the 1877 Supreme Court case of *Machine Co. v. Murphy*,³³ and continued to be used over the years.³⁴

In *Murphy*, the Court found that the defendants’ paper bag-making device infringed the patentholder’s device. Although this case was decided nearly a quarter-century after *Winans*, the *Murphy* court did not separate the infringement inquiry into literal and equivalent components. Rather, the Court used the phrase “in determining the question of infringement” in prefacing the above standard.³⁵ Just as in the *Gray* opinion, the Court referred only to “infringement,” not to literal infringement or infringement under the doctrine of equivalents.³⁶

Originally then, there was no separate category of infringement under the doctrine of equivalents. Rather, the equivalence analysis was simply part of a fundamental, generic infringement inquiry. As noted by the *Murphy* Court, “the substantial equivalent of a thing, in the sense of the patent law, is the same as the thing itself.”³⁷ This conception of infringement equates devices that meet the standard of having “substantially the same function in substantially the same way

29. See *infra* note 30 and accompanying text.

30. 10 F. Cas. 1015, 1016 (C.C.D. Pa. 1817) (No. 5,718) (Washington, Circuit Justice).

31. See *id.*

32. However, the term “doctrine of equivalents” was not used until *McCormick v. Talcott*, 61 U.S. (20 How.) 402 (1857).

33. 97 U.S. 120, 125 (1877).

34. See, e.g., *Cantrell v. Wallick*, 117 U.S. 689 (1886).

35. *Murphy*, 97 U.S. at 125.

36. *Id.*

37. *Id.*

to obtain the same result” with actual, literal copies of a patentee’s device.

In the following decade, the phrase “substantially the same function in substantially the same way to obtain the same result” surfaced in another Supreme Court case, *Cantrell v. Wallick*.³⁸ Quoting the *Murphy* opinion, Justice Woods affirmed an appeals court decision finding infringement of a patent for enameling moldings.³⁹ Once again, the Court did not distinguish between infringement types, and referred only to “the question of infringement” when introducing this analysis.⁴⁰

Nearly half a century later, in *Sanitary Refrigerator Co. v. Winters*, the Supreme Court again quoted the *Murphy* opinion’s characterization of infringement as “substantially the same function in substantially the same way to obtain the same result.”⁴¹ Formally, the single-dimension approach to infringement analysis had not changed. No explicit separation between literal infringement and infringement under the doctrine of equivalents yet existed. By describing a copy of a patented device as being “without variation, or with such variations as are consistent with its being in substance the same thing,” the Court demonstrated its conviction that a substantial copy was simply a type of copy.⁴² Yet, *Sanitary Refrigerator* did contain terms suggesting that it conducted more than just a literal infringement analysis. The Court’s approach to infringement repeatedly referred to a “range of equivalents,”⁴³ and a “range of equivalency.”⁴⁴ As in the preceding cases, however, the formal phrase “doctrine of equivalents” was never used.

It was not until 1950, when the Supreme Court decided *Graver Tank & Mfg. Co. v. Linde Air Products Co.*,⁴⁵ that formal recognition emerged for distinctions between types of general infringement. While *Graver Tank* is called by one leading authority the “leading modern day decision on the doctrine until recently,”⁴⁶ it is more appropriately characterized as the case that described the doctrine. The *Graver Tank* Court did not create the doctrine out of whole cloth, but through the formal recognition acknowledged the gradual conceptual separation in the case law. Once again, the Court quoted the language “substantially the same function in substantially the

38. 117 U.S. 689, 695 (1886).

39. *See id.*

40. *Id.* at 694.

41. 280 U.S. 30, 42 (1929).

42. *Id.* at 42 (quoting *Burr v. Duryee*, 68 U.S. (1 Wall.) 531, 573 (1863)).

43. *Id.* at 40–41.

44. *Id.* at 33–34.

45. 339 U.S. 605 (1950).

46. PRINCIPLES OF PATENT LAW, *supra* note 10, at 875.

same way to obtain the same result.”⁴⁷ Here, however, the Court cited its decision in *Sanitary Refrigerator*, where infringement analysis had proceeded under a markedly different conception of infringement than in *Murphy*.⁴⁸ In the seventy-three years that separated *Murphy* and *Graver Tank*, the Court had shifted its use of the function-way-result analysis from a method of determining infringement in general to using this test as a key support for a new conceptual entity.

C. Co-Evolution: Infringement Analysis and Claim Practice

How did the basic conceptual underpinnings of patent infringement in 1817 turn into the doctrine of equivalents as explicitly announced in *Graver Tank*? A substantial part of the answer lies in the changing nature of patent claims. In the early cases, courts were less stringent in the requirement that a patent make clear and explicit claims. The *Gray* Court wrote that “if the jury should be of opinion, that the specification is materially defective, the objection will not be sufficient to invalidate the plaintiffs’ patent, unless they should also be satisfied, that the concealment of the circumstances not described, was intended to deceive the public.”⁴⁹ The *Gray* Court made this declaration despite its acknowledgment that “[t]he law declares that [a specification] must be full, clear, and explicit, so as to distinguish it from all other machines of the same kind, and to enable any person skilled in the art, of which it is a branch, to make and use the same.”⁵⁰

The permissiveness of early courts in allowing patents not to be “full, clear, and explicit”⁵¹ required that infringement analysis not follow a purely literal approach. The *Gray* Court looked to the “principle” of the invention instead of the invention itself, which the Court referred to as the “form,” to determine the subject of infringement.⁵² Instead of reciting the claims, the court described the machines:

In the [patentee’s machine], we find the two jaws of a vice, the one fixed and the other moveable on a pivot at the top, which connects them together. In each of these jaws is fixed a cutter, the use of which is to cut off from the bar of iron as much as will be

47. *Graver Tank*, 339 U.S. at 608.

48. Compare *Sanitary*, *supra* note 41, and accompanying text, with *Graver Tank*, 339 U.S. at 608.

49. *Gray v. James*, 10 F. Cas. 1015, 1018 (C.C.D. Pa. 1817) (No. 5,718).

50. *Id.*

51. *Id.*

52. *Id.* at 1016 (“[I]t is contended that that machine is different, not only in form, but in principle from the plaintiffs’ machine.”).

necessary to form the nail, which, being separated, falls by its own gravity into a die, which holds it by a firm grip[] until the head is formed, by what is called the set or heading die.⁵³

It is not clear from the opinion what the patent claims were, if there were in fact any.

The *Gray* Court's approach highlights elements of the governing statutory law. At the time the *Gray* court decided the case, the Patent Act stated:

That every inventor, before he can receive a patent . . . shall deliver a written description of his invention, and of the manner of using, or process of compounding the same, in such full, clear and exact terms, as to distinguish the same from all other things before known⁵⁴

Given the *Gray* Court's declaration that a defect in the "full, clear and exact terms"⁵⁵ of a patent specification could be overcome by a failure to show that the imprecision was "intended to deceive the public,"⁵⁶ it is safe to conclude that the focus was not upon claim language. Instead, the much less definitive standard of the invention's "principle" was used. This part of the 1793 Patent Act states: "[I]n the case of any machine, he shall fully explain the principle, and the several modes in which he has contemplated the application of that principle or character, by which it may be distinguished from other inventions"⁵⁷ The *Gray* court thus decided that the principle of the accused device could not be distinguished from that of the patented machine.

Although the 1836 Patent Act provided further explication of claiming requirements, the language referring to precision of language in the written description did not change substantially.⁵⁸ The language of this portion of the 1836 Act closely mirrors that of the 1793 Act: "[An inventor] shall deliver a written description of his invention or discovery, and of the manner and process of making, constructing, using, and compounding the same, in such full, clear, and exact

53. *Id.* at 1016–17.

54. Patent Act, ch. 11, § 3, 1 Stat. 318, 321 (1793).

55. *Id.*

56. *Gray*, 10 F. Cas. at 1018.

57. Patent Act, ch. 11, § 3, 1 Stat. 318, 321–22 (1793).

58. *Compare* Patent Act, ch. 357, § 6, 5 Stat. 117 (1836), with 1793 Patent Act, *supra* text accompanying note 54.

terms”⁵⁹ The language of the statutes does not suggest substantial changes to the claiming requirements after 1836 relative to those created by the 1793 Act. Yet, in patent descriptions written after 1836, it is evident that the written descriptions did employ fuller, clearer, and more exact language than that used by the patentee in the 1817 *Gray* case.⁶⁰ The language of the *Winans* patent is just one example.⁶¹ Whereas the *Gray* Court needed to rely on its own description of the patentee’s invention, the *Winans* Court could cite the patentee’s claim for a description of the invention. Given the kind of precision associated with such language as the “frustum of a cone,”⁶² the *Winans* Court faced a more difficult challenge: justifying infringement when the patent’s own descriptive terms suggested otherwise. To be sure, the *Winans* Court had the principle of the invention available for reference.⁶³ However, the principle described by Winans in his patent also did not provide the same interpretive flexibility available in *Gray*. The principle itself described the rail car as “conical” and referred to its general shape as a “circle.”⁶⁴ As a result, the Court could not simply rely on a description of the principle to support its decision in *Winans*.

The precision of claim language in this era varied from patent to patent, however. The claims of the intervening cases between *Winans* and *Graver Tank* reflect the varied interpretations prior to the formal recognition of the doctrine of equivalents. In the 1877 *Murphy* case, the Court referred to the patent claims, but paraphrased them.⁶⁵ In the 1886 *Cantrell* case, the Court quoted the patent claim,⁶⁶ but the claim itself relied largely upon other parts of the specification, such as a

59. *Id.*

60. The general trend toward increasing precision in claim language may be due to the creation of a formal mechanism for evaluation of patents in the 1836 Patent Act, namely the creation of a Patent Office. See 1 DONALD S. CHISUM, CHISUM ON PATENTS OV-5 (2003); see also *supra* text accompanying note 13.

61. See *supra* text accompanying note 15.

62. See *Winans v. Denmead*, 56 U.S. 330, 331 (1853).

63. See *supra* text accompanying note 16.

64. See *Winans*, 56 U.S. at 331.

65. See *Mach. Co. v. Murphy*, 97 U.S. 120 (1877). In referring to the claims, the Court wrote:

Seven claims are annexed to the specification, the one in question being described in substance and effect as follows: Making the cutter which cuts the paper from the roll in such form that in cutting off the paper it cuts it in the required form to fold into a bag without further cutting out.

Id. at 122.

66. See *Cantrell v. Wallick*, 117 U.S. 689 (1886). The Court quoted the claim as stating, “An enameling box divided into two compartments by a slotted partition, and having openings at the ends in a line with the slot in the partition, all substantially as and for the purpose set forth.” *Id.* at 694.

section stating the purpose of the invention,⁶⁷ and references to the figures.⁶⁸ The 1929 *Sanitary* opinion also quoted the patent claim language, but the elaborateness and exactitude of these claims far surpassed those of the preceding two cases.⁶⁹ *Sanitary* highlights the evolution of equivalence language as the precision of patent language increased. As the claims became more precise, the analysis shifted from discussions of a general kind of infringement to doctrines permitting infringement findings despite the claim language.⁷⁰

As the form of the patent claim changed from the specific to the descriptive, so too did the nature of infringement analysis. What was once an inherent aspect of the only analysis — whether an infringer used a device that was substantially the same, in the same manner, to achieve the same result — evolved into the function-way-result analysis under the doctrine of equivalents. Modern claim structure and the doctrine of equivalents address the same problem — that of divergences from exact copies. When the Supreme Court first formulated the idea that literal infringement, copying, is a “dull and very rare type of infringement,”⁷¹ it was solidifying an idea of literal infringement that had not existed at the outset of the patent system.

The early cases do not classify types of infringement. The change in claim language over the years and the emergence of the two types of infringement, literal infringement and infringement under the doctrine of equivalents, are interrelated. The change in infringement analysis represents a manner of addressing the problem of excessive literalism. Originally, when patents were represented by specific

67. *See id.*

68. *See id.*

69. *See Sanitary Refrig. Co. v. Winters*, 280 U.S. 30 (1929). The Court quoted claims 1 and 7 of the patent. Claim 1 reads:

In combination, a door and a casing therefor[e], a keeper attached to the casing comprising a base, an outstanding post and a head at the outer portion of the post, said head depending below the post and formed with upper and lower curved outer sides coming substantially to a point and with an inner upwardly and inwardly inclined side, a member attached to the door comprising a base, an integral outstanding post projecting from the base and a laterally extending arm at the upper end of the post paralleling the base, and a latch lever pivotally mounted between its ends between the said arm and base of said member, said lever having one arm formed with an under cam side extending from the pivot and adapted to be engaged under the depending portion of the keeper, a handle portion extending in the opposite direction from the pivot and another arm projecting from the handle portion a distance from the pivot and lying substantially at right angles to the first arm of the lever and likewise being formed with an inner cam side, substantially as and for the purposes described.

Id. at 37.

70. *See supra* text accompanying notes 37–48.

71. *Graver Tank & Mfg. Co. v. Linde Air Prods. Co.*, 339 U.S. 605, 607 (1950).

embodiments, the understanding was that infringement was based not strictly upon those embodiments, but the underlying principles. In effect, every determination of infringement dealt with, to some degree, equivalent structures. As claim language became more precise, it became clear that the original type of infringement analysis, if applied in an identical manner, effectively broadened patents beyond their intended scope. At the same time, there was still a need for the old style of infringement analysis. Claim language, though more particular, was not perfect, and could not always capture the full scope of invention. The doctrine of equivalents was necessary to remedy this problem. The danger, however, was that overbroad applications of the doctrine would lead to unclear limits on patent claims. The challenge to the judiciary, then, was to find a way to limit the doctrine of equivalents without eliminating it.

III. JUDICIAL REGULATION

At present, the all-elements rule and prosecution history estoppel are the two primary solutions employed by the judiciary to regulate the doctrine of equivalents. Utilizing a related area of patent law, judges can also exercise a great deal of discretion over claim interpretation to narrow the literal scope of a patent's claims. Subsequent application of the doctrine of equivalents to encompass an accused infringer's device then becomes less feasible than under a broader interpretation.

A. The All-Elements Rule

After *Graver Tank*, the Supreme Court did not consider the doctrine of equivalents until *Warner-Jenkinson*.⁷² The Court in *Warner-Jenkinson* embraced the all-elements rule as a method of reigning in the unchecked use of the doctrine of equivalents to expand, and in some instances to ignore, patent claims. The rule states that “[e]ach element contained in a patent claim is deemed material to defining the scope of the patented invention, and thus the doctrine of equivalents must be applied to individual elements of the claim, not to the invention as a whole.”⁷³ The impetus for this formal pronouncement was a problem that had been plaguing courts, namely, that the doctrine of equivalents was being used too expansively.⁷⁴

72. *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17 (1997).

73. *Id.* at 29.

74. As one post-*Warner-Jenkinson* commentator pointed out, “Cases were being tried based on the claim as a whole and how the accused device is equivalent to that claim.” Belvis, *supra* note 10, at 64.

The all-elements rule, much like the doctrine of equivalents, was a judicially-announced standard that had evolved from a long history of cases. More than 100 years before *Warner-Jenkinson*, the Supreme Court had expressed the idea of performing infringement analysis based upon equivalent structures for individual elements of a patent.⁷⁵ Despite the presence of several cases in the interim,⁷⁶ over the course of the century preceding *Warner-Jenkinson*, there was no general recognition of an all-elements requirement.⁷⁷ This lack of regulation led to the doctrine of equivalents being “unbounded by the patent claims.”⁷⁸

From the historical examinations of infringement analysis and the all-elements rule, the pattern that emerges is one where courts pontificate over a particular case or set of facts. If the resulting pronouncement is repeated and proves useful in addressing a pattern of problems or issues that subsequently arises, it becomes formalized into a doctrine or a rule.⁷⁹ With respect to the doctrine of equivalents in general and the all-elements rule in particular, this mix of gradualism and necessity appears to have guided judicial development of the patent law.

B. Prosecution History Estoppel

Historically, prosecution history estoppel was influenced by the same trend in infringement analysis that guided the development of the doctrine of equivalents.⁸⁰ For literal infringement, the analogue to prosecution history estoppel’s limiting effect on the doctrine of equivalents is claim disclaimer.⁸¹ In the early cases, the courts did not make an explicit distinction between claim disclaimer for the purpose of interpreting claims and prosecution history estoppel for the purpose of estopping the doctrine of equivalents.⁸² As was the case with the doctrine of equivalents, this ambiguity reflects the evolving nature of infringement analysis, originally performed under a single category and later transformed into the two categories of literal infringement and equivalents infringement.

75. See Jay I. Alexander, *Cabining the Doctrine of Equivalents in Festo*, 51 AM. U. L. REV. 553, 565–66 (2002) (tracing the origin of the all-elements rule as far back as *Water-Meter Co. v. Desper*, 101 U.S. 332 (1879)).

76. See *id.*

77. See Belvis, *supra* note 10, at 63–65.

78. *Warner-Jenkinson*, 520 U.S. at 28–29.

79. Perhaps the same principle applies to common law in general.

80. That is, until the Federal Circuit’s decision in *Festo VI*. See Part IV, *infra*.

81. Claim disclaimer is the process of modifying a patent to encompass only material that is new. See *infra* note 83 and accompanying text.

82. See Wagner, *supra* note 5, at 181–84.

Two cases discussed below, *Warner-Jenkinson* and *Markman*,⁸³ represent the formal conceptual split of judicially-determined claim disclaimer and prosecution history estoppel. This process explicitly began with the 1836 Patent Act.⁸⁴ This Act provided details for the patent examination process.⁸⁵ No such provisions were included in its predecessor, the 1793 Patent Act.⁸⁶ With respect to prosecution history, the 1836 Patent Act created the mechanism by which correspondences between the Patent Commissioner and the patent applicant were formalized.⁸⁷ Furthermore, it expressly stated that the Patent Commissioner, upon determining that “any part of that which is claimed as new had before been invented or discovered,” would notify the applicant.⁸⁸ The concept of claim disclaimer was born of the subsequent phrase, which was a reference to the patent applicant “altering his specification to embrace only that part of the invention or discovery which is new.”⁸⁹ Upon receiving notice, as well as “information and references,”⁹⁰ from the Commissioner that the claimed matter was not entirely new, the patent applicant would be in a position to make the necessary modifications to the patent application.

By itself, the examination procedure codified by the 1836 Patent Act did not necessitate the consideration of prosecution history in the two different contexts of literal infringement and equivalents infringement. It did, however, generate additional information with which to interpret the scope of a patent’s claims. In the ensuing years, as it became more apparent in the case law that two types of patent infringement exist,⁹¹ the question of whether to employ a similarly bifurcated treatment of prosecution history followed.

Graver Tank, the first Supreme Court opinion to make explicit that patent infringement is of two types, was decided in 1950.⁹² It was not until 1996, in *Markman*, that the Supreme Court formalized the link between claim disclaimer and claim interpretation by noting that “judges, not juries, are the better suited to find the acquired meaning

83. *Markman v. Westview Instruments, Inc.*, 517 U.S. 370 (1996).

84. Ch. 357, 5 Stat. 117 (1836). This clear difference between the 1836 and 1793 Patent Acts with respect to prosecution history is in contrast with the not-so-obvious difference in claiming requirements, which nonetheless was accompanied by fundamental changes in the actual formalities of claim practice. See Part II.C, *supra*.

85. See Patent Act of 1836, § 7.

86. Ch. 11, 1 Stat. 318 (1793).

87. See Patent Act of 1836, § 7 (“[T]he Commissioner shall make or cause to be made, an examination of the alleged new invention or discovery. . . .”). *Id.*

88. *Id.*

89. *Id.*

90. *Id.*

91. See Part II.B, *supra*.

92. See 339 U.S. 605 (1950).

of patent terms.”⁹³ The Federal Circuit’s *Markman* opinion had noted that “[t]he court has broad power to look as a matter of law to the prosecution history of the patent in order to ascertain the true meaning of language used in the patent claims”⁹⁴

The year after it issued the *Markman* opinion, the Supreme Court in *Warner-Jenkinson* expressly associated prosecution history estoppel with the doctrine of equivalents.⁹⁵ In the summary of the holdings preceding the opinion, prosecution history is described as a “well-established limitation on the doctrine of equivalents . . . whereby a surrender of subject matter during patent prosecution may preclude recapturing any part of that subject matter, even if it is equivalent to the matter expressly claimed.”⁹⁶ After pointing out that many of its prior cases invoked prosecution history estoppel because the patentee had amended claims to avoid encompassing prior art, the Supreme Court in *Warner-Jenkinson* asserted that not all claim amendments result in prosecution history estoppel of the doctrine of equivalents.⁹⁷

The common link between claim interpretation and prosecution history estoppel is reflected in the language of the Supreme Court’s recent *Festo VII* opinion: “Prosecution history estoppel requires that the claims of a patent be interpreted in light of the proceedings in the PTO [Patent and Trademark Office] during the application process.”⁹⁸ This is a striking statement, if one assumes that determinations of claim interpretation and literal infringement are discrete from analysis of equivalents infringement. The admonition that “claims of a patent be interpreted” evokes the idea of claim interpretation, which is performed by courts prior to a determination of whether a patent was literally infringed.⁹⁹ Language indicative of claim interpretation appears in conjunction with the Court’s discussion of prosecution history estoppel because both practices share common historical roots.

In creating and molding the doctrine of equivalents, the judiciary did not confine the expansion of its interpretive authority to this area of patent law. The related area of claim construction was also affected. Under *Markman*, judges were given the authority to interpret claims, and this interpretation was shortly thereafter explained as being based primarily upon intrinsic evidence, and secondarily upon extrinsic evidence.¹⁰⁰ This intrinsic evidence includes prosecution

93. 517 U.S. 370, 388 (1950).

94. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 980 (Fed. Cir. 1995).

95. *See* 520 U.S. 17 (1997).

96. *Id.* at 18–19.

97. *See id.* at 32.

98. 535 U.S. 722, 733 (2002).

99. *See Markman*, 52 F.3d at 1003.

100. *See Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582–84 (Fed. Cir. 1996).

history.¹⁰¹ The prosecution history often records amendments made by the patent applicant during the application process, and judges have frequently used this written record to inform their interpretations of claims.

Thus, traditional function-way-result analysis, the all-elements rule, and prosecution history estoppel do not comprise the entirety of judicial constraints upon the judicially-formulated doctrine of equivalents, nor do they represent a boundary for such restrictions.¹⁰² The bench also uses the powerful tool of claim construction to limit the scope of claims. Once limited for the purpose of defining literal scope, it becomes easier for a judge to likewise limit the range of equivalents. To illustrate using the familiar example of *Winans*, the Court could have interpreted the “circular” limitation to mean a perfect circle. Alternatively, the interpretation could have embraced a polygonal, circle-like shape. If the latter, then the range of equivalents more easily encompasses an octagon; if the former, then equivalents would have to extend considerably further to encompass the infringer’s practice.

Historically, claim disclaimer is interwoven with prosecution history estoppel. Prosecution history is often used to interpret and narrow a claim when a patentee, during the application process, amends a claim. When the scope of a claim is thus narrowed, it is possible that the surrendered subject matter cannot be reclaimed through the doctrine of equivalents.¹⁰³ Similarly, this surrendered subject matter also limits the definition of a claim for the purposes of claim construction. In theory, claim construction should be a greater constriction upon any given patent element than prosecution history estoppel, because claim construction takes into account multiple limiting factors, whereas prosecution history estoppel refers only to the correspondence record between the patent applicant and the Patent and Trademark Office.

101. *See id.*

102. For a recent example of such a curtailment, involving another limitation entirely, see *Johnson & Johnston Assoc. v. R.E. Serv. Co.*, 285 F.3d 1046 (Fed. Cir. 2002) (holding that plaintiff could not use the doctrine of equivalents to encompass subject matter that was disclosed in the patent specification but not covered in the claims). There is also the “known interchangeability” test first explained in *Graver Tank & Mfg. Co. v. Linde Air Prods. Co.*, 339 U.S. 605, 609 (1950) (“Whether persons reasonably skilled in the art would have known of the interchangeability of an ingredient not contained in the patent with one that was”), and reiterated in *Hilton Davis Chem. Co. v. Warner-Jenkinson Co.*, 62 F.3d 1512 (Fed. Cir. 1995), *rev’d. on other grounds*, 520 U.S. 17 (1997).

103. *See Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 30 (1997).

In *Festo VI*, the Federal Circuit attempted to equalize this scheme by instituting an absolute bar¹⁰⁴ on the doctrine of equivalents in the presence of *any*¹⁰⁵ narrowing claim amendment related to patentability.¹⁰⁶ As concededly novel as this approach was,¹⁰⁷ its actual effect was nothing short of radical, as evidenced by the following empirical analysis. In the wake of *Festo VI*, it appeared that the Federal Circuit no longer recognized the efficacy of the doctrine of equivalents.

IV. JUDICIAL TERMINATION: *FESTO*

A. Defining the Stakes

Since its formal recognition in *Graver Tank*, jurists and commentators have called for the elimination of the doctrine of equivalents.¹⁰⁸ As argued in the previous sections, the doctrine was not so much spontaneously conceived as gradually developed over a prolonged period of time. Accordingly, it contains many threads of reasoning, not all of which are easily resolved. *Festo VI* represents an attempt by the Federal Circuit to unravel this multi-layered complexity by using prosecution history estoppel to totally reconceive the limits of the doctrine. The effort, though valiant, ultimately failed, as the Supreme Court re-established the former structure of prosecution history estoppel in *Festo VII*.¹⁰⁹

104. See 234 F.3d 558, 569 (Fed. Cir. 2000) (“When a claim amendment creates prosecution history estoppel with regard to a claim element, there is no range of equivalents available for the amended claim element.”).

105. See *id.* at 568 (stating that, in addition to a claim amendment required by the Patent and Trademark Office, “a voluntary amendment that narrows the scope of a claim for a reason related to the statutory requirements for a patent will give rise to prosecution history estoppel as to the amended claim element.”).

106. See *id.* at 566 (stating that “a narrowing amendment made for any reason related to the statutory requirements for a patent will give rise to prosecution history estoppel with respect to the amended claim element.”).

107. See *id.* at 592 (Plager, J., concurring) (describing *Festo VI* as establishing “the new rules of engagement”).

108. See, e.g., *Graver Tank & Mfg. Co. v. Linde Air Prods. Co.*, 339 U.S. 605, 612–18 (1950) (Black, J., dissenting); Paul M. Janicke, *Heat of Passion: What Really Happened In Graver Tank*, 24 AIPLA Q.J. 1, 153 (1996) (“All things considered, it is time to eliminate this doctrine. Conceived in fairness, it now does more mischief than it achieves benefit.”).

109. In addition, the Supreme Court added a rebuttable presumption standard to the proposition that claim narrowing during prosecution constitutes a “general disclaimer of the territory between the original claim and the amended claim.” *Festo VII*, 535 U.S. 722, 740 (Fed. Cir. 2002). The standard places the burden upon the patentholder to establish that “at the time of the amendment one skilled in the art could not reasonably be expected to have drafted a claim that would have literally encompassed the alleged equivalent.” *Id.* at 741. As further explanation of this standard, the Court stated:

The equivalent may have been unforeseeable at the time of the application; the rationale underlying the amendment may bear no

The reaction to the *Festo VI* decision highlights that more was at stake than the single strand of the doctrine apparent on its face. Commentators perceived the need and opportunity for novel innovation or radical reform in the doctrine of equivalents.¹¹⁰ The *Festo VI* decision appeared to signal the Federal Circuit's eagerness for dramatic alteration of the doctrine.¹¹¹ Consequently, following the Federal Circuit decision to take up the case en banc,¹¹² seven amicus briefs were filed.¹¹³ When the en banc court reached its decision, four dissents to the majority opinion were written.¹¹⁴ Opponents of doctrinal change became involved in the debate as well: renowned originalist Robert Bork, former federal court of appeals judge, argued

more than a tangential relation to the equivalent in question; or there may be some other reason suggesting that the patentee could not reasonably be expected to have described the insubstantial substitute in question.

Id. at 740–41.

On September 20, 2002, the Federal Circuit directed the parties to brief the issue of whether the rebuttable presumption is a question of law or fact and the issue of “[w]hat factors are encompassed by the criteria set forth by the Supreme Court.” *Festo VIII*, 304 F.3d 1289, 1290 (2002). The Federal Circuit heard oral arguments regarding these issues on February 6, 2003. On September 26, 2003, the Federal Circuit held that the rebuttable presumption is a question of law that comes within the exclusive jurisdiction of the court and should be judged on three factors: the unforeseeability of the equivalent at the time of the narrowing amendment, the relevance of the amendment to the infringement, and the presence of another reason why the amendment did not describe the substitute. *See Festo IX*, No. 95-1066, 344 F.3d 1359 (Fed. Cir. 2003) (en banc).

110. *See, e.g.*, Raj S. Davé, *A Mathematical Approach to the Doctrine of Equivalents*, 16 HARV. J.L. & TECH. 507 (2003) (recommending the application of an algorithm to the function-way-result prong of the doctrine of equivalents); R. Polk Wagner, *Reconsidering Estoppel: Patent Administration and the Failure of Festo*, 151 U. PA. L. REV. 159, 164 (2002) (calling for the removal of “the traditional, equivalents-centered view of prosecution history estoppel” and the institution of a “framework of incentives and strategic choices” to take its place); Anthony L. Ryan & Roger G. Brooks, *Innovation v. Evasion: Clarifying Patent Rights in Second-Generation Genes and Proteins*, 17 BERKELEY TECH. L.J. 1265 (suggesting the development of a “known interchangeability” test in applying the doctrine of equivalents to nucleotide and protein sequences).

111. *See, e.g.*, *Festo VI*, 234 F.3d at 571 (Fed. Cir. 2000) (asserting that an absolute bar to the doctrine of equivalents is justified “because the Supreme Court has not fully addressed the range of equivalents that is available once prosecution history estoppel applies”); *id.* at 575 (justifying in part the decision to institute an absolute bar based upon the observation that “the notice function of patent claims has become paramount, and the need for certainty as to the scope of patent protection has been emphasized”); *id.* (expressing simultaneously the awareness of the “Supreme Court’s teaching that binding precedent is not to be lightly discarded” and the position that “rules qualify as ‘workable’ when they can be relied upon to produce consistent results and give rise to a body of law that provides guidance to the marketplace on how to conduct its affairs”).

112. *See Festo V*, 187 F.3d 1381 (Fed. Cir. 1999).

113. *See Festo VI*, 234 F.3d 558 (Fed. Cir. 2000). More than thirty amicus briefs were also filed for the later appeal to the Supreme Court, prompting Justice Stevens to remark, “I can’t say I’ve read them all.” *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 2002 WL 22010 (Oral Argument), *17–*18 (Jan. 8, 2002).

114. *See Festo VI*, 234 F.3d 558 (Fed. Cir. 2000).

the subsequent appeal to the Supreme Court for the petitioners.¹¹⁵ In his oral argument, Judge Bork emphasized the radicalness of the *Festo VI* decision and argued that such an abrupt change in the doctrine should not be undertaken by the courts.¹¹⁶ Thus, this patent dispute had been drawn into the ongoing battle over the nature of legitimate jurisprudence.

B. After Festo VI: Questioning Specific Outcomes

A recent law review case note by Paul Onderick examines prosecution history estoppel and the doctrine of equivalents¹¹⁷ through the lens of a single Federal Circuit case, *Turbocare v. General Electric*.¹¹⁸ After a thorough exposition of the prosecution history for the patent at issue in *Turbocare*,¹¹⁹ followed by a linguistic analysis of the patent's claim language,¹²⁰ Onderick concludes that an absolute bar to the doctrine of equivalents, under *Festo VI*, should have been applied in *Turbocare*, though the court declined to do so.¹²¹ Onderick then asks, "[W]hy was the Federal Circuit backing away from its decision in *Festo [VI]*?"¹²²

Onderick's answer includes some speculation as to the motivations of the Federal Circuit judges.¹²³ He notes that "at least some justices on the Federal Circuit may have begun to shift their approach away from *Festo [VI]*."¹²⁴ Also, some Federal Circuit judges may have been compelled by arguments that spoke to a potential depreciation in patent valuations.¹²⁵ These explanations, while insightful, are inherently incomplete. It is important to note that the views of the Federal Circuit bench cannot be represented by a single panel decision, where typically only three judges hear the case.¹²⁶

115. See Transcript of Oral Argument, *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 2002 WL 22010, (Jan. 8, 2002).

116. See *id.* at 3, 48–49. Through his writings, Judge Bork has emerged as a strong proponent of limitations on judicial power, arguing that "[t]he intended function of the federal courts is to apply the law as it comes to them from the hands of others." ROBERT H. BORK, *THE TEMPTING OF AMERICA* 4 (1990).

117. See Paul C. Onderick, *Narrowing Claim Amendment or Just Redefining the Invention: Prosecution History Estoppel and the Doctrine of Equivalents Under Turbocare v. General Electric*, 4 MINN. INTEL. PROP. REV. 123 (2002).

118. See *TurboCare Div. Of Demag Delaval Turbomachinery Corp. v. Gen. Elec. Co.*, 264 F.3d 1111 (Fed. Cir. 2001).

119. See Onderick, *supra* note 116, at 138–41.

120. See *id.* at 142–45.

121. See *id.*

122. *Id.* at 124.

123. See *id.* at 145–46.

124. *Id.* at 145.

125. See *id.* at 145–46.

126. See FED. R. APP. P. 47.2(a) ("Cases and controversies will be heard and determined by a panel consisting of an odd number of at least three judges . . ."); see also Appendices

Turbocare was decided by a panel of Federal Circuit judges comprised of Judge Bryson, Judge Gajarsa, and Judge Linn. Of the panel members, Bryson and Gajarsa joined the majority opinion of *Festo VI*,¹²⁷ which announced the absolute bar on the doctrine of equivalents in the presence of a narrowing claim amendment.¹²⁸ Judge Linn dissented on the question of the absolute bar.¹²⁹

A unanimous en banc opinion explicitly disavowing the absolute bar would be the most explicit evidence of a shift in Federal Circuit attitude toward prosecution history estoppel of the doctrine of equivalents. Such a case did not arise after *Festo VI* and before the Supreme Court's decision in *Festo VII*. Failing such a definitive judicial statement, another approach to tracking changes in judicial attitude in this area is to make a comprehensive, case-by-case examination of Federal Circuit decisions involving prosecution history estoppel and the doctrine of equivalents in the time frame surrounding the *Festo VI* decision.

C. Evaluating the Record

1. The *Festo VI* and *Festo VII* Decisions

A study gauging the evolution of judicial attitudes must select an appropriate time period to consider. With respect to *Festo* and the doctrine of equivalents, the most obvious date around which to study is November 29, 2000, when the Federal Circuit issued *Festo VI*. This is the date on which narrowing claim amendments during the prosecution history of a patent began to invoke an absolute bar to the doctrine of equivalents.¹³⁰ This rule changed again on May 28, 2002, when the Supreme Court issued its opinion in *Festo VII*.¹³¹ During the 545-day period between these two decisions,¹³² the appropriate questions to ask with respect to the doctrine of equivalents are: 1) How was prosecution history estoppel affected?; and 2) How was the doctrine of equivalents affected?

The most straightforward manner of answering the above questions involves examining how the doctrine of equivalents fared

A and B, *infra* (citing cases, the vast majority of which were determined by three-judge panels).

127. *Festo VI*, 234 F.3d 558, 558 (Fed. Cir. 2000).

128. *See id.* at 569.

129. *See id.* at 558.

130. *See id.* at 569 (Fed. Cir. 2000) (formalizing the rule as “[w]hen a claim amendment creates prosecution history estoppel with regard to a claim element, there is no range of equivalents available for the amended claim element”).

131. 535 U.S. 722 (2002).

132. *See* Calculate Duration Between Two Dates, at <http://www.timeanddate.com/date/duration.html> (last visited Nov. 5, 2003).

on the appellate level during this time period. More specifically, in those cases where the Federal Circuit considered the availability of the doctrine of equivalents, how often did it foreclose?¹³³ Also, how often did prosecution history estoppel foreclose the doctrine? By supporting the answers in this study with quantitative data, this analysis is repeatable for other periods in the history of the doctrine.

2. The Baseline Comparison

A baseline for comparison is needed to provide a useful answer to the above inquiries. The frequencies with which the Federal Circuit utilized prosecution history estoppel and the doctrine of equivalents during the period where the absolute bar of *Festo VI* was technically good law is only useful to the extent that these frequencies can be compared to a previous time period. This study uses the duration between the *Festo VI* and *Festo VII* decision dates to select an appropriate start date, June 3, 1999: 545 days prior to *Festo VI*.¹³⁴ During this time period, the relevant questions are: 1) How often did the Federal Circuit allow the doctrine of equivalents?; and 2) How often did the Federal Circuit invoke prosecution history estoppel?

3. The Grant of Certiorari

Because this Article examines to what extent the doctrine of equivalents is conceived of and controlled by the judiciary, the present analysis also uses June 18, 2001, as a key date. This is the date on which the Supreme Court granted certiorari to hear the *Festo VI* case.¹³⁵ Under the theory of this Article, this date may represent a point where the strength of the doctrine of equivalents as measured by a quantitative, comprehensive analysis of Federal Circuit cases shifts. A doctrine more prone to judicial handling should be affected by the perception associated with the grant of certiorari to a controversial decision. In this case, the Federal Circuit's sense of the prospect of a reversal of *Festo VI* may have affected its treatment of the doctrine of equivalents.

133. Foreclosure is defined as taking place when the doctrine of equivalents is no longer available as a theory of infringement after a discussion by the Federal Circuit that makes specific reference to the doctrine.

134. See Date Calculator, at <http://www.timeanddate.com/date/dateadd.html> (last visited Nov. 5, 2003).

135. See *Festo VI*, 533 U.S. 915 (2001).

4. Results of the Study

a. Before Festo VI

From June 8, 1999, to November 28, 2000, the Federal Circuit considered infringement under the doctrine of equivalents in sixty-six cases.¹³⁶ In twenty-four of these cases, the Federal Circuit invoked prosecution history estoppel to bar the use of the doctrine of equivalents.¹³⁷ In fourteen of these cases, the doctrine of equivalents was still available to the patentholder after the Federal Circuit issued its opinion.¹³⁸

b. After Festo VI

From November 29, 2000, to May 28, 2002, the Federal Circuit considered infringement under the doctrine of equivalents in seventy-six cases.¹³⁹ In twenty-five of these cases, the Federal Circuit invoked prosecution history estoppel to foreclose the doctrine of equivalents.¹⁴⁰ In eleven of these cases, the doctrine of equivalents

136. For a list of these cases, see Appendix A, *infra*. These cases were retrieved by a Lexis search of the Federal Circuit database using the term “doctrine of equivalents” and limiting the search from July 8, 1999 to November 28, 2000. This search yielded 106 cases. The cases where the doctrine of equivalents is discussed and its availability determined are listed in Appendix A.

137. *See, e.g.*, Loral Fairchild Corp. v. Sony Corp., 181 F.3d 1313 (Fed. Cir. 1999); Cortland Line Co. v. Orvis Co., 203 F.3d 1351 (Fed. Cir. 2000); Lampi Corp. v. Am. Power Prods., Inc., 228 F.3d 1365 (Fed. Cir. 2000).

138. *See* Vermeer Mfg. Co. v. Charles Mach. Works, Inc., No. 00-1119, 2000 U.S. App. LEXIS 30121 (Fed. Cir. Nov. 27, 2000); Caterpillar, Inc. v. Deere & Co., 224 F.3d 1374 (Fed. Cir. 2000); Iscar Ltd. v. Sandvik, A.B., No. 99-1577, 2000 U.S. App. LEXIS 22189 (Fed. Cir. Aug. 25, 2000); Fiskars, Inc. v. Hunt Mfg. Co., 221 F.3d 1318 (Fed. Cir. 2000); TA Instruments, Inc. v. Perkin-Elmer Corp., No. 99-1538, 2000 U.S. App. LEXIS 12024 (Fed. Cir. June 1, 2000); Optical Disc Corp. v. Del Mar Avionics, 208 F.3d 1324 (Fed. Cir. 2000); IMS Tech., Inc. v. Haas Automation, Inc., 206 F.3d 1422 (Fed. Cir. 2000); Kraft Foods, Inc. v. Int’l Trading Co., 203 F.3d 1362 (Fed. Cir. 2000); Middleton, Inc. v. 3M, No. 99-1201, 1999 U.S. App. LEXIS 29872 (Fed. Cir. Nov. 16, 1999); Overhead Door Corp. v. Chamberlain Group, Inc., 194 F.3d 1261 (Fed. Cir. 1999); Nova Biomed. Corp. v. i-Stat Corp., No. 98-1460, 1999 U.S. App. LEXIS 21390 (Fed. Cir. Sept. 3, 1999); Bickerstaff v. Dr. Shrink, Inc., No. 99-1091, 1999 U.S. App. LEXIS 21601 (Fed. Cir. Sept. 3, 1999); WMS Gaming, Inc. v. Int’l Game Tech., 184 F.3d 1339 (Fed. Cir. 1999); Smiths Indus. Med. Sys., Inc. v. Vital Signs, Inc., 183 F.3d 1347 (Fed. Cir. 1999).

139. For a list of these cases, see Appendix B, *infra*. These cases were retrieved by a Lexis search of the Federal Circuit database using the search phrase “doctrine of equivalents” and limiting the search from November 29, 2000, to May 28, 2002. This search yielded 117 cases. The cases where the doctrine of equivalents is discussed and its availability determined are listed in Appendix B.

140. *See, e.g.*, Pioneer Magnetics v. Micro Linear Corp., 238 F.3d 1341 (Fed. Cir. 2000) (the first post-*Festo VI* case invoking the absolute bar); Karsten Mfg. Corp. v. Cleveland Golf Co., 242 F.3d 1376 (Fed. Cir. 2001); Day Int’l, Inc. v. Reeves Bros. Inc., 260 F.3d 1343 (Fed. Cir. 2001) (finding prosecution history estoppel based upon subject matter surrendered during prosecution history).

was still available to the patentholder after the Federal Circuit issued its opinion.¹⁴¹

c. Considering Certiorari

The Supreme Court granted certiorari to hear *Festo VI* on June 18, 2001. From November 29, 2000 to June 18, 2001, the Federal Circuit considered infringement under the doctrine of equivalents in twenty-seven cases.¹⁴² In twelve of these cases, the Federal Circuit invoked prosecution history estoppel to foreclose the doctrine of equivalents. In *none* of these cases was the doctrine of equivalents still available to the patentholder after the Federal Circuit issued its opinion.

5. Analysis

With respect to the frequency of prosecution history estoppel, this study reaches interesting, but perhaps not dramatic, conclusions. On first impression, it appears that *Festo VI* did not have a significant impact on the frequency with which the Federal Circuit invoked prosecution history estoppel. Between the *Festo VI* and *Festo VII* decision dates, the Federal Circuit used prosecution history estoppel to estop the doctrine of equivalents in twenty-five cases. Over the same length of time prior to *Festo VI*, the Federal Circuit used prosecution history to estop the doctrine of equivalents in twenty-four cases, which is not a significant difference.¹⁴³ However, the situation changes when taking into account the date on which the Supreme Court granted certiorari. Between the *Festo VI* decision date and the date the Supreme Court granted certiorari, the Federal Circuit invoked prosecution history estoppel in twelve out of twenty-seven cases, a

141. See *Catalina Mktg. Int'l, Inc. v. Coolsavings*, 289 F.3d 801 (Fed. Cir. 2002); *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359 (Fed. Cir. 2002); *Abbott Labs. v. Dey, L.P.*, 287 F.3d 1097 (Fed. Cir. 2002); *Leggett & Platt, Inc. v. Hickory Springs Mfg. Co.*, No. 01-1255, 2002 U.S. App. LEXIS 5643 (Fed. Cir. Apr. 2, 2002); *Interactive Pictures Corp. v. Infinite Pictures, Inc.*, 274 F.3d 1371 (Fed. Cir. 2001); *Bose Corp. v. JBL, Inc.*, 274 F.3d 1354 (Fed. Cir. 2001); *DoorKing, Inc. v. Sentex Sys.*, No. 00-1490, 2001 U.S. App. LEXIS 20483 (Fed. Cir. Sept. 13, 2001); *TurboCare Div. of Demag Delaval Turbomachinery Corp. v. GE Co.*, 264 F.3d 1111 (Fed. Cir. 2001); *Viskase Corp. v. American Nat'l Can Co.*, 261 F.3d 1316 (Fed. Cir. 2001); *Dow Chem. Co. v. Sumitomo Chem. Co.*, 257 F.3d 1364 (Fed. Cir. 2001); *Gart v. Logitech, Inc.*, 254 F.3d 1334 (Fed. Cir. 2001).

142. See Appendix B, *infra*.

143. Nor is the difference much more pronounced when taking into account frequency of invocation relative to the number of cases where the Federal Circuit considered the doctrine of equivalents. Prior to *Festo VI*, the Federal Circuit invoked prosecution history estoppel in twenty-four out of sixty-six cases, a 36.4% frequency. Between *Festo VI* and *Festo VII*, the Federal Circuit invoked prosecution history estoppel in twenty-five out of seventy-six cases, a 32.9% frequency.

44.4% frequency. Between the date the Supreme Court granted certiorari and the *Festo VII* decision date, the Federal Circuit invoked prosecution history estoppel in thirteen out of forty-nine cases, a 26.5% frequency. The Federal Circuit invoked prosecution history estoppel with substantially less frequency after the Supreme Court granted certiorari.

This result, while interesting, does not by itself support a strong statement regarding judicial control of prosecution history estoppel, much less the doctrine of equivalents. Granted, it is possible that the decreased frequency could be attributed to a conscious shift in judicial attitudes on the Federal Circuit bench toward prosecution history estoppel in light of unfavorable review of *Festo VI* by the Supreme Court. Without more compelling data, such a statement would only be thinly-supported speculation. An examination of the foreclosure of the doctrine of equivalents over the same period of time, however, provides more compelling data.

This data reveals that, between the time the Federal Circuit issued *Festo VI* and the time the Supreme Court granted certiorari, there were no Federal Circuit cases where a patentholder could subsequently employ the doctrine of equivalents. What makes this result particularly surprising is the dramatic increase in the number of cases where a patentholder could still assert infringement under the doctrine of equivalents once the Supreme Court granted certiorari. Statistically, prior to the *Festo VI* decision, a patentholder could still employ the doctrine of equivalents, subsequent to a Federal Circuit decision that considered the doctrine, with a frequency of 21.2%.¹⁴⁴ After the *Festo VI* decision and before the Supreme Court granted certiorari, this frequency fell to 0%.¹⁴⁵ From the date the Supreme Court granted certiorari until it issued its opinion in *Festo VII*, the frequency escalated to 22.4%, just slightly greater than the pre-*Festo VI* level.¹⁴⁶

Figure 1 is a graphic illustration of how dramatically the treatment of the doctrine of equivalents changed between the time the Federal Circuit issued *Festo VI* and when the Supreme Court granted certiorari to hear the appeal. The respective dates of these events, November 29, 2000 and June 18, 2001, encompass 201 days.¹⁴⁷ In this time span, the Federal Circuit, upon examination of the issue, failed to find the doctrine of equivalents viable in any case.¹⁴⁸ In the same 201-day time period preceding the *Festo VI* decision, the Federal Circuit,

144. Fourteen out of sixty-six cases.

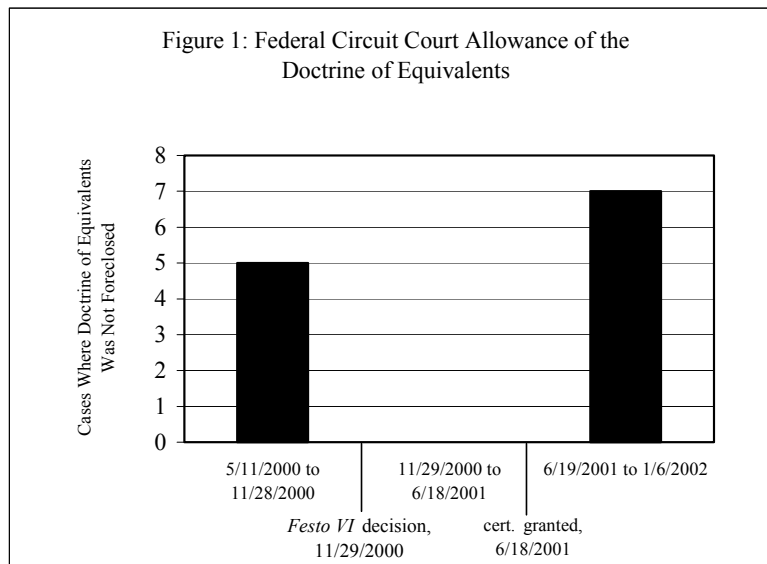
145. Zero out of twenty-seven cases.

146. Eleven out of forty-nine cases.

147. See Calculate Duration Between Two Dates, *supra* note 132.

148. See Appendix B, *infra*.

upon examination of the doctrine of equivalents issue, upheld the viability of the doctrine in five cases.¹⁴⁹ In the 201-day time period subsequent to the Supreme Court's grant of certiorari, the Federal Circuit, upon examination of the doctrine of equivalents issue, upheld the viability of the doctrine in seven cases.¹⁵⁰ It is interesting to note that the endpoint of this latter period, January 6, 2002, comes 142 days before the Supreme Court overturned the *Festo VI* decision on May 28, 2002.



These numbers provide preliminary data justifying further examination of the proposition that the judiciary can exercise a remarkable degree of control over the doctrine of equivalents.¹⁵¹ At present, the most compelling empirical support for the malleability of the doctrine of equivalents is that, after the *Festo VI* decision, the Federal Circuit foreclosed the doctrine of equivalents in every case where this was an issue. That the judiciary might retain full discretion to foreclose the doctrine is indicated by the fact that availability of the doctrine of equivalents resurfaced in full force, even though the controlling case law had not yet changed.

149. See Appendix A, *infra*.

150. See Appendix B, *infra*.

151. Of course, it is always important to remain cognizant of the fundamental tenet that correlation does not equal causation. Further analytical rigor, perhaps in a future study, could be achieved by performing a regression analysis based upon multiple factors, including prosecution history estoppel.

Any hypothesis of continued judicial discretion to foreclose the doctrine of equivalents, however, must be considered in the context both of the Federal Circuit's retreat from absolute foreclosure and the Supreme Court's subsequent ruling in *Festo VII*. The notice, certainty, and workability critiques of the doctrine of equivalents that formed the cornerstone of the *Festo VI* rationale did not escape the Court's notice.¹⁵² Nevertheless, it adopted portions of Judge Bork's analysis, rebuking the Federal Circuit for its attempt to solve these problems and emphasizing *stare decisis* and the limited role of courts to enact change.¹⁵³ Must we then conclude that further judicial reform of the doctrine is hopeless and that all subsequent development must be done by Congress? The answer may depend on a minimally-explored area of patent law: the interaction of conservative judicial doctrines with the evolutionary, judicially-created nature of the patent laws as chronicled here.¹⁵⁴ It seems likely that this gradualist approach is itself the approach that a conservative-minded Court would uphold. In response to change in the statutory patent law and the types of patent claims, the appropriate judicial tack may be to adapt existing precedent in a gradual fashion, relying heavily on well-established arguments and principles.

V. CONCLUSION

The lesson of *Festo* is not that judicial control over the doctrine of equivalents is absolute. The data presented in this article do not support such a conclusion, in part because of the limited scope of the time periods studied. And even a similar study examining a broader set of time periods would not necessarily support such a position. Although the present data suggest two extreme shifts in foreclosure rates, it is quite possible that the second of these shifts was restorative. In other words, after *Festo VI*, the foreclosure rate dramatically dropped, but the dramatic change following certiorari served to

152. See *Festo VII*, 535 U.S. at 732–33; *Festo VI*, 234 F.3d at 575.

153. See *supra* notes 6, 115–16, and accompanying text.

154. A few commentators have tangentially considered the intersection of doctrines such as textualism and originalism with the doctrine of equivalents and judicial patent interpretation. See, e.g., Brooke Quist, *The Supreme Court Provides Clarity to the Illusive Doctrine of Equivalents*, 5 TEX. INTELL. PROP. L.J. 363, 378–79 (1997) (arguing that “designing around” a patent is a key element of originalist interpretation of the patent doctrine); cf. John R. Thomas, *Liberty and Property in the Patent Law*, 39 Hous. L. Rev. 569, 609–10 (2002) (considering whether originalism and textualism limit the scope of the patent law). Nevertheless, a direct treatment of this issue does not yet exist, even in the wake of the *Festo* litigation. Even Judge Bork did not supply more than the outer boundary of an answer, arguing only that the “drastic” nature of the Federal Circuit's proposed rule required consideration by Congress or the Patent and Trademark Office. See Transcript of Oral Argument, *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 2002 WL 22010, *48–*49 (Jan. 8, 2002).

restore the rate to the pre-*Festo VI* level. Thus, two judicial extremes may reflect a tendency by the two courts to remain consistent with each other.

One conclusion can be drawn, however; the doctrine of equivalents is judge-made law. It is a legal device that gradually evolved in the case law as a response to the changing nature of patent claims. From the fundamental function-way-result rubric to the all-elements rule to prosecution history estoppel and the related practice of claim interpretation, the historical evolution of the case law highlights a gradual approach grounded in adherence to precedent and cautiously informed by statutory and practical developments in patent law. While the absolute bar of *Festo VI* may have been a boon for predictability and the public notice function of patents, the mechanism of its creation simply did not adhere to the well-established gradualist approach. Thus, the reason why the absolute bar of *Festo VI* did not survive Supreme Court analysis is that this new rule was too radical to comport with the judicial standard of doctrinal change. In accordance with the historical development of the doctrine of equivalents, the Federal Circuit should have adhered to the underlying principle of gradualism based on previously established legal reasoning, in response to practical needs. The absolute bar of *Festo VI* did not satisfy this principle.

To withstand Supreme Court review in the practical world of changes to judicial doctrine, future changes should be grounded more in gradualist and conservative principles and less in novel approaches or policy-based rationales. For the doctrine of equivalents, the historical trends in the case law reveal this standard to be especially salient. Would-be reformers of the judicial doctrine of equivalents will find that appeals to judicial precedent and case-based practical considerations, rather than to economic and mathematical analyses, hold better prospects for acceptance by the bench. Granted, this may entail a relatively long process, but the historical evolution of the doctrine of equivalents requires this careful approach. More novel, radical ideas, meritorious though they may be, are more appropriately and effectively directed to Congress for legislative action.

APPENDIX A

CASES WHERE THE FEDERAL CIRCUIT CONSIDERED THE
DOCTRINE OF EQUIVALENTS: 6/8/1999 TO 11/28/2000

(Opinions that did not foreclose the doctrine of equivalents appear in bold.)

Date	Case Name	Citation
6/8/1999	Loral Fairchild Corp. v. Sony Corp.	181 F.3d 1313
6/8/1999	Augustine Med., Inc. v. Gaymar Indus.	181 F.3d 1291
6/8/1999	Pall Corp. v. HemaSure, Inc.	181 F.3d 1305
6/8/1999	Riggs Mktg., Inc. v. Mitchell	1999 U.S. App. LEXIS 11862
6/22/1999	Nagle Indus. V. Ford Motor Co.	1999 U.S. App. LEXIS 13918
7/6/1999	Odetics, Inc. v. Storage Tech. Corp.	185 F.3d 1259
7/12/1999	McClarín Plastics, Inc. v. LRV Acquisition Corp.	1999 U.S. App. LEXIS 15491
7/14/1999	Smiths Indus. Med. Sys., Inc. v. Vital Signs, Inc.	183 F.3d 1347
7/19/1999	Caouette v. Presby	1999 U.S. App. LEXIS 16694
7/20/1999	WMS Gaming, Inc. v. Int'l Game Tech.	184 F.3d 1339
7/29/1999	Zelinski v. Brunswick Corp.	185 F.3d 1311
8/9/1999	Evans Med. Ltd. v. Am. Cyanamid Co.	1999 U.S. App. LEXIS 18436
8/24/1999	Interlink Elecs. v. Incontrol Solutions, Inc.	1999 U.S. App. LEXIS 20072
8/31/1999	Antonious v. Spalding & Evenflo Cos.	1999 U.S. App. LEXIS 22984
9/3/1999	Nova Biomed. Corp. v. i-Stat Corp.	1999 U.S. App. LEXIS 21390
9/3/1999	Bloomstein v. Paramount Pictures Corp.	1999 U.S. App. LEXIS 21391
9/3/1999	Merck & Co. v. Mylan Pharms., Inc.	190 F.3d 1335
9/3/1999	Bickerstaff v. Dr. Shrink, Inc.	1999 U.S. App. LEXIS 21601
9/13/1999	K-2 Corp. v. Salomon S.A.	191 F.3d 1356
9/15/1999	Elkay Mfg. Co. v. Ebco Mfg. Co.	192 F.3d 973
10/6/1999	Abbey v. Robert Bosch GmbH	1999 U.S. App. LEXIS 24813
10/13/1999	Overhead Door Corp. v. Chamberlain Group, Inc.	194 F.3d 1261
10/29/1999	Essilor Int'l v. Nidek Co.	1999 U.S. App. LEXIS 28426
11/16/1999	Middleton, Inc. v. 3M	1999 U.S. App. LEXIS 29872
11/29/1999	Kamyr, Inc. v. Clement	1999 U.S. App. LEXIS 30706
12/6/1999	Manchak v. Chem. Waste Mgmt., Inc.	1999 U.S. App. LEXIS 32001
12/6/1999	Marquip, Inc. v. Fosber Am., Inc.	198 F.3d 1363
12/17/1999	Wang Lab., Inc. v. Am. Online, Inc.	197 F.3d 1377
1/5/2000	NFA Corp. v. Asheboro Elastics Corp.	2000 U.S. App. LEXIS 68

Date	Case Name	Citation
2/8/2000	Ramp R & D Co. v. Structural Panels, Inc.	2000 U.S. App. LEXIS 1674
2/14/2000	Cortland Line Co. v. Orvis Co.	203 F.3d 1351
2/14/2000	Kraft Foods, Inc. v. Int'l Trading Co.	203 F.3d 1362
2/29/2000	Ultra-Tex Surfaces, Inc. v. Hill Bros. Chem. Co.	204 F.3d 1360
3/1/2000	Speedplay, Inc. v. Bebop, Inc.	211 F.3d 1245
3/15/2000	Stairmaster Sports/Med. Prods. v. Groupe Procycle, Inc.	2000 U.S. App. LEXIS 3989
3/24/2000	Zodiac Pool Care, Inc. v. Hoffinger Indus.	206 F.3d 1408
3/27/2000	IMS Tech., Inc. v. Haas Automation, Inc.	206 F.3d 1422
4/7/2000	Optical Disc Corp. v. Del Mar Avionics	208 F.3d 1324
4/7/2000	Kemco Sales, Inc. v. Control Papers Co.	208 F.3d 1352
4/14/2000	Hill-Rom Co. v. Kinetic Concepts, Inc.	209 F.3d 1337
4/24/2000	Kristar Enters. v. Revel Envtl. Mktg., Inc.	2000 U.S. App. LEXIS 7351
4/27/2000	Toro Co. v. Ariens Co.	2000 U.S. App. LEXIS 8253
5/12/2000	Bayer AG v. Elan Pharm. Research Corp.	212 F.3d 1241
5/22/2000	Vehicular Techs. Corp. v. Titan Wheel Int'l, Inc.	212 F.3d 1377
6/1/2000	Elekta Instrument S.A. v. O.U.R. Sci. Int'l, Inc.	214 F.3d 1302
6/1/2000	TA Instruments, Inc. v. Perkin-Elmer Corp.	2000 U.S. App. LEXIS 12024
6/2/2000	Koenig v. Fugro-McClelland (Southwest), Inc.	2000 U.S. App. LEXIS 14607
6/9/2000	Wooster Brush Co. v. Newell Operating Co.	2000 U.S. App. LEXIS 14132
6/30/2000	Canton Bio-Medical, Inc. v. Integrated Liner Techs., Inc.	216 F.3d 1367
7/14/2000	Sammon v. Nat'l Hand Tool Div., Stanley Works, Inc.	2000 U.S. App. LEXIS 16987
7/20/2000	Ishida Co. v. Taylor	221 F.3d 1310
7/24/2000	Fiskars, Inc. v. Hunt Mfg. Co.	221 F.3d 1318
8/2/2000	Hilgraeve Corp. v. McAfee Assocs.	224 F.3d 1349
8/18/2000	KCJ Corp. v. Kinetic Concepts, Inc.	223 F.3d 1351
8/23/2000	Space Systems/Loral, Inc. v. Lockheed Martin Corp.	2000 U.S. App. LEXIS 21414
8/24/2000	CAE Screenplates, Inc. v. Heinrich Fiedler GmbH & Co. KG	224 F.3d 1308
8/25/2000	Iscar Ltd. v. Sandvik, A.B.	2000 U.S. App. LEXIS 22189
9/11/2000	Upjohn Co. v. MOVA Pharm. Corp.	225 F.3d 1306
9/14/2000	Caterpillar, Inc. v. Deere & Co.	224 F.3d 1374
9/21/2000	Cultor Corp. v. A.E. Staley Mfg. Co.	224 F.3d 1328

Date	Case Name	Citation
9/21/2000	Brita Wasser-Filter-Systeme, GmbH v. Recovery Eng'g, Inc.	2000 U.S. App. LEXIS 23758
9/22/2000	Moore U.S.A., Inc. v. Standard Register Co.	229 F.3d 1091
9/28/2000	Lampi Corp. v. Am. Power Prods.	228 F.3d 1365
10/10/2000	Bai v. Toy Island Mfg. Co.	2000 U.S. App. LEXIS 25235
10/26/2000	Dunhall Pharms., Inc. v. Discus Dental, Inc.	2000 U.S. App. LEXIS 26924
11/22/2000	Alcide Corp. v. ABS Global, Inc.	2000 U.S. App. LEXIS 29610
11/27/2000	Vermeer Mfg. Co. v. Charles Mach. Works, Inc.	2000 U.S. App. LEXIS 30121

APPENDIX B

CASES WHERE THE FEDERAL CIRCUIT CONSIDERED THE
DOCTRINE OF EQUIVALENTS: 11/29/2000 TO 5/28/2002

(The *Festo VI* decision, the grant of certiorari for *Festo*, and opinions that did not foreclose the doctrine of equivalents appear in bold.)

Date	Case Name	Citation
11/29/2000	Federal Circuit issues decision in <i>Festo VI</i>	234 F.3d 558
12/12/2000	Stryker Corp. v. Davol, Inc.	234 F.3d 1252
12/14/2000	Vanguard Prods. Corp. v. Parker Hannifin Corp.	234 F.3d 1370
1/23/2001	Pioneer Magnetics v. Micro Linear Corp.	238 F.3d 1341
2/5/2001	Litton Sys. v. Honeywell, Inc.	238 F.3d 1376
2/9/2001	Collett v. Piper's Saw Shop, Inc.	2001 U.S. App. LEXIS 2046
2/13/2001	Biovail Corp. Int'l v. Andrx Pharms., Inc.	239 F.3d 1297
2/13/2001	DeMarini Sports v. Worth, Inc.	239 F.3d 1314
2/13/2001	Forest Labs., Inc. v. Abbott Labs.	239 F.3d 1305
3/8/2001	Maltezos v. AT&T Corp.	2001 U.S. App. LEXIS 3611
3/12/2001	Senior Techs., Inc. v. R.F. Techs., Inc.	2001 U.S. App. LEXIS 4179
3/14/2001	SciMed Life Sys. v. Advanced Cardiovascular Sys.	242 F.3d 1337
3/14/2001	Netword, LLC v. Centraal Corp.	242 F.3d 1347
3/22/2001	Karsten Mfg. Corp. v. Cleveland Golf Co.	242 F.3d 1376
3/26/2001	Insituform Techs. v. Cat Contr.	2001 U.S. App. LEXIS 4570
4/6/2001	Optimal Rec. Solutions, LLP v. Leading Edge Techs., Inc.	2001 U.S. App. LEXIS 5772
4/17/2001	Schoell v. Regal Marine Indus.	247 F.3d 1202
4/20/2001	Medtronic, Inc. v. Advanced Cardiovascular Sys.	248 F.3d 1303
4/25/2001	Telemac Cellular Corp. v. Topp Telecom, Inc.	247 F.3d 1316
4/30/2001	Lockheed Martin Corp. v. Space Systems/Loral, Inc.	249 F.3d 1314
5/2/2001	Oak Tech., Inc. v. ITC	248 F.3d 1316
5/2/2001	Altech Controls Corp. v. EIL Instruments, Inc.	2001 U.S. App. LEXIS 8089
5/7/2001	Bernard Dalsin Mfg. Co. v. RMR Prods.	2001 U.S. App. LEXIS 8888
5/14/2001	Creo Prods. v. Dainippon Screen Mfg. Co.	2001 U.S. App. LEXIS 9302
5/30/2001	Mycogen Plant Sci., Inc. v. Monsanto Co.	252 F.3d 1306
5/31/2001	Accuscan, Inc. v. Xerox Corp.	2001 U.S. App. LEXIS 11534
6/8/2001	Semitool, Inc. v. Novellus Sys.	2001 U.S. App. LEXIS 11986
6/13/2001	Unique Coupons, Inc. v. Northfield Corp.	2001 U.S. App. LEXIS 12839

Date	Case Name	Citation
6/18/2001	Supreme Court grants certiorari for <i>Festo</i>	533 U.S. 915
6/26/2001	Gart v. Logitech, Inc.	254 F.3d 1334
6/27/2001	Durel Corp. v. Osram Sylvania, Inc.	256 F.3d 1298
7/6/2001	Hallco Mfg. Co. v. Foster	256 F.3d 1290
7/18/2001	Avery Dennison Corp. v. Flexcon Co.	2001 U.S. App. LEXIS 16784
7/25/2001	Dow Chem. Co. v. Sumitomo Chem. Co.	257 F.3d 1364
7/30/2001	Mollhagen v. Witte	2001 U.S. App. LEXIS 17142
7/31/2001	Viskase Corp. v. American Nat'l Can Co.	261 F.3d 1316
8/7/2001	Pall Corp. v. PTI Techs. Inc.	259 F.3d 1383
8/8/2001	Masimo Corp. v. Mallinckrodt, Inc.	2001 U.S. App. LEXIS 18032
8/9/2001	Day Int'l, Inc. v. Reeves Bros., Inc.	260 F.3d 1343
8/10/2001	KX Indus., L.P. v. Pur Water Purification Prods.	2001 U.S. App. LEXIS 18155
8/16/2001	Monsanto Co. v. Mycogen Plant Sci., Inc.	261 F.3d 1345
8/17/2001	Bell Atl. Network Servs., Inc. v. Covad Communs. Group, Inc.	262 F.3d 1258
8/20/2001	Glaxo Group Ltd. v. Ranbaxy Pharms.	262 F.3d 1333
8/29/2001	TurboCare Div. of Demag Delaval Turbomachinery Corp. v. Gen. Elec.	264 F.3d 1111
9/5/2001	Kustom Signals, Inc. v. Applied Concepts, Inc.	264 F.3d 1326
9/6/2001	Ecolab, Inc. v. Envirochem, Inc.	264 F.3d 1358
9/12/2001	Fin Control Sys. Pty, Ltd. v. OAM, Inc.	265 F.3d 1311
9/13/2001	DoorKing, Inc. v. Sentex Sys.	2001 U.S. App. LEXIS 20483
9/24/2001	Toro Co. v. White Consol. Indus.	266 F.3d 1367
9/28/2001	Circle R, Inc. v. Trail King Indus.	2001 U.S. App. LEXIS 22017
10/9/2001	Ballard Med. Prods. v. Allegiance Healthcare Corp.	268 F.3d 1352
10/10/2001	Asyst Techs., Inc. v. Empak, Inc.	268 F.3d 1364
11/2/2001	J & M Corp. v. Harley-Davidson, Inc.	269 F.3d 1360
11/27/2001	Hemphill v. McNeil-PPC, Inc.	2001 U.S. App. LEXIS 27471
12/5/2001	Dethmers Mfg. Co. v. Automatic Equip. Mfg. Co.	272 F.3d 1365
12/17/2001	Intermatic, Inc. v. Lamson & Sessions Co.	273 F.3d 1355
12/17/2001	Bose Corp. v. JBL, Inc.	274 F.3d 1354
12/20/2001	Interactive Pictures Corp. v. Infinite Pictures, Inc.	274 F.3d 1371
12/21/2001	Kudlacek v. DBC, Inc.	2001 U.S. App. LEXIS 27659
1/4/2002	Pactiv Corp. v. S.C. Johnson & Son, Inc.	2002 U.S. App. LEXIS 903
1/8/2002	Talbert Fuel Sys. Patents Co. v. Unocal Corp.	275 F.3d 1371
1/16/2002	Saeilo, Inc. v. Colt's Mfg. Co.	2002 U.S. App. LEXIS 909
2/1/2002	Tegal Corp. v. Tokyo Electron Co.	2002 U.S. App. LEXIS 1992
2/27/2002	Neutrik AG v. Switchcraft, Inc.	2002 U.S. App. LEXIS 4432

Date	Case Name	Citation
3/4/2002	Display Techs. v. Paul Flum Ideas, Inc.	282 F.3d 1340
3/28/2002	Johnson & Johnston Assocs. v. R.E. Serv. Co.	2002 U.S. App. LEXIS 5171
4/2/2002	Leggett & Platt, Inc. v. Hickory Springs Mfg. Co.	2002 U.S. App. LEXIS 5643
4/10/2002	Charles E. Hill & Assocs. v. Comuserve, Inc.	2002 U.S. App. LEXIS 6895
4/11/2002	Techsearch L.L.C. v. Intel Corp.	2002 U.S. App. LEXIS 7202
4/16/2002	IGC - Med. Advances, Inc. v. United States Instruments, Inc.	2002 U.S. App. LEXIS 6891
4/23/2002	Abbott Labs. V. Dey, L.P.	287 F.3d 1097
4/29/2002	Genentech, Inc. v. Amgen, Inc.	289 F.3d 1640
5/3/2002	CCS Fitness, Inc. v. Brunswick Corp.	288 F.3d 1359
5/7/2002	McKeown v. Bayshore Concrete Prods. Corp.	2002 U.S. App. LEXIS 8913
5/8/2002	Catalina Mktg. Int'l v. Coolsavings	289 F.3d 801
5/8/2002	Okor v. Sony Computer Entm't Am.	2002 U.S. App. LEXIS 8912
5/14/2002	Cooper Cameron Corp. v. Kvaerner Oilfield Prods.	2002 U.S. App. LEXIS 9174
5/22/2002	B&W Custom Truck Beds, Inc. v. Metalcraft, Inc.	2002 U.S. App. LEXIS 10912