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INNOVATION AND THE U.S. PATENT SYSTEM

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INTRODUCTION.....	208
I. DISCUSSION	210
A. The Federal Circuit’s Changes.....	212
1. Change One: “Person of Ordinary Skill in the Art”.....	212
2. Change Two: “Increased Uncertainty”.....	214
3. Change Three: Excessive Patent Damages.....	217
B. The Effects of the Federal Circuit’s Changes.....	218
C. How Did We Get Here?.....	225
II. RECOMMENDATIONS	233
CONCLUSION	236

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THERE is a ferment about possible reform of the U.S. patent system. Scholars have taken an interest, and law review articles,¹ economic analyses,² and books³ on the topic have boomed. Both the Federal Trade Commission (FTC) and the National Research Council (NRC) of the National Academy of Sciences (NAS) have published reports,⁴ and legislation has been introduced in Congress.⁵ The patent attorney lobby groups in Washington, D.C. have weighed in with their comments, and the FTC and NRC, in conjunction with the American Intellectual Property Law Association (AIPLA), one of the patent attorney lobby groups, held “town meetings” around the country to drum-up support.

The topic of this Essay is innovation and patents, and more specifically, the effect of the current U.S. patent system on innovation in the United States. Because the topic is large, the Essay will touch only high spots. It will deal with our current patent system and its effects on innovation, describe how we arrived at our present state, and conclude with the Author’s own prescription for reform.

INTRODUCTION

In discussing the current U.S. patent system and its effect on innovation, it is essential to start with a clear understanding of what innovation is, and what it is not. It is also essential to understand the relationship between innovation and patents.

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1. See Robert P. Merges, *As Many as Six Impossible Patents Before Breakfast: Property Rights for Business Concepts and Patent Reform*, 14 BERKELEY TECH. L.J. 577 (1999), which certainly wins the prize for the most imaginative title.
 2. See Robert Hunt, *Patent Reform: A Mixed Blessing for the U.S. Economy?*, BUS. REV., Nov.–Dec. 1999, at 15; see also Robert M. Hunt, *Nonobviousness and the Incentive to Innovate: An Economic Analysis of Intellectual Property Reform* (Fed. Reserve Bank of Phila., Working Paper No. 99-3, 1999), available at <http://www.phil.frb.org/files/wps/1999/wp99-3.pdf> (proposing a more efficient nonobviousness requirement based on economic models).
 3. See ADAM B. JAFFE & JOSH LERNER, *INNOVATION AND ITS DISCONTENTS: HOW OUR BROKEN PATENT SYSTEM IS ENDANGERING INNOVATION AND PROGRESS, AND WHAT TO DO ABOUT IT*, (Princeton University Press 2004) for a thought-provoking treatment of the subject.
 4. See FTC, *TO PROMOTE INNOVATION: THE PROPER BALANCE OF COMPETITION AND PATENT LAW AND POLICY* (2003), available at <http://www.ftc.gov/os/2003/10/innovationrpt.pdf>; COMM. ON INTELLECTUAL PROP. IN THE KNOWLEDGE-BASED ECON., NAT’L RESEARCH COUNCIL, *A PATENT SYSTEM FOR THE 21ST CENTURY* (2004), available at <http://www.nap.edu/html/patentsystem/0309089107.pdf>.
 5. See, e.g., Patent Reform Act of 2005, H.R. 2795, 109th Cong. (2005); Patent Reform Act of 2006, S. 3818, 109th Cong. (2006).

Innovation is the *commercialization* of new products, processes, and services. Innovators are entrepreneurial, even when they are large companies. Innovators make investments, and take risks. Further, though invention may precede innovation, invention alone does not qualify as innovation. Neither does obtaining a patent qualify as innovation.⁶

Only commercialization qualifies as innovation, and it is innovation regardless of whether or not the commercialized product, process, or service is patented. In fact, it is innovation even if the commercialized product, process, or service turns out to be an infringement of another's patent. After all, the infringer-innovator commercialized the product, process, or service, made the investment, and took the business risk necessary to do so.

Since a patent gives its owner the right to exclude others from practicing the patented invention, it follows that successful innovation depends on the *absence* of patents owned by others affecting the innovation, or at least on the ability to obtain licenses under such others' patents. If someone else owns a valid patent that covers one's proposed innovation, the innovator is stymied if he or she cannot obtain a license.⁷ And, if the would-be innovator is stymied, the investment made in the potential innovation is wasted, resulting in a loss both to the would-be innovator and to society.

If a business falls within *any* of the classes of patentable subject matter—and it is difficult now to imagine any that do not⁸—then that business is a participant in the U.S. patent system, whether it wants to be or not. Participation is involuntary; a business cannot “opt out,” even if it would like to.

A central task for would-be innovators, therefore, is to devise and follow strategies for preventing or blocking others from obtaining patents that might impede or preclude commercialization of their innovations. This is done by would-be innovators by seeking patents on their own inventions they might

6. Many economists have argued that competition, not monopoly, is the principal driving force for innovation in capitalist economies such as ours. *See, e.g.*, WILLIAM J. BAUMOL, *THE FREE MARKET INNOVATION MACHINE: ANALYZING THE GROWTH MIRACLE OF CAPITALISM* (2002).

7. Ownership of a patent does not authorize its owner to practice the patented invention. The patent owner may practice his or her patented invention only if it is not covered by the valid patent of another, or if he or she secures a license under the other's patent.

8. For example, decisions by the Court of Appeals for the Federal Circuit have extended the availability of patent coverage to intangibles such as business methods and computer software per se, but it remains to be seen whether the Supreme Court will approve of these decisions. *See* AT&T Corp. v. Excel Commc'n, 172 F.3d 1352 (Fed. Cir. 1999); *State St. Bank v. Signature Fin. Group*, 149 F.3d 1368 (Fed. Cir. 1998); *cf.* *Lab. Corp. of Am. Holdings v. Metabolite Labs., Inc.*, 370 F.3d 1354 (Fed. Cir. 2004), *cert. granted*, 126 S.Ct. 601 (2005), *cert. dismissed*, 2006 U.S. LEXIS 4893 (U.S., June 22, 2006).

commercialize in the hope of preempting or blocking others from obtaining such patents. This is called defensive patenting, and it is a universal strategy for innovators.

The paramount motivation for these would-be innovators is not the expectation of a patent monopoly, but rather the hope of preempting and blocking others from obtaining patents that might impede their own innovations, or at least being in a position to extract licenses from others when needed. This idea was succinctly stated by a venture capitalist quoted in the San Jose Mercury News: “[n]one of my companies seek[s] patent protection because they actually think it will protect them from competition Rather, they seek patents to protect themselves from other people who have patents.”⁹

The patent proliferation that results from the U.S. patent system’s current low standards for patentability and the necessity for would-be innovators to engage in defensive patenting is felt forcefully throughout the business community and among innovators. More patents mean more patent obstacles and higher costs for would-be innovators. It follows, therefore, that higher standards for patentability would be conducive to innovation: fewer patents would mean fewer patent obstacles and lower costs for would-be innovators. Hence, a goal of this Essay is to set forth a restored structure for the U.S. patent system that should result in the restoration of higher (and more certain) patentability standards, that, in turn, should foster, rather than impede, innovation.

I. DISCUSSION

Understanding the impact of the current U.S. patent system on innovation in the United States must begin with formation of the Federal Circuit Court of Appeals in 1982. With the exception of extending the availability of patent protection to subject matter areas not previously patentable, there have been three major changes affecting innovation in the United States brought about by the Federal Circuit, all on its own, without the

9. Mark A. Lemley, *Rational Ignorance at the Patent Office*, 95 NW. U. L. REV. 1495, 1504 n.41 (2001) (quoting Scott Herhold, *Patent War Pending*, SAN JOSE MERCURY NEWS, July 18, 1999, at 1E); see Wesley M. Cohen, Richard R. Nelson & John P. Walsh, *Protecting Their Intellectual Assets: Appropriability Conditions and Why U.S. Manufacturing Firms Patent (or Not)* (Nat’l Bureau of Econ. Research, Working Paper No. 7522, 2000) (discovering in their survey of why firms seek patents that “Blocking,” i.e., preempting others from obtaining patents, is the second most common reason given for seeking patents, closely followed by “Prevent Suits,” and “For Use in Negotiations,” all of which are aspects of defensive patenting).

benefit of Supreme Court decisions or statutory amendments.¹⁰ These changes are lowered standards for patentability, increased uncertainty and unpredictability as to the outcome of patent litigation, and excessive damages for patent infringement.¹¹

Prior to the advent of the Federal Circuit, high standards for patentability prevailed in the United States. Gloria Koenig, in a study of Court of Appeals decisions from the passage of the current U.S. patent statute in 1952 through 1977 (prior to the advent of the Federal Circuit in 1982), found that 65.7% (nearly two-thirds) of patents reaching the Circuit Courts of Appeals for which there were validity decisions were ruled invalid.¹² The remainder, about one-third, were valid and capable of being infringed. The courts, in effect, were protecting innovators from patents that never should have issued in the first place.¹³

The Federal Circuit, which came into existence in 1982, immediately lowered the standards for patentability, initially ruling that approximately two-thirds of the patents that reached it were valid and capable of being infringed—a complete reversal of the prior statistic.¹⁴ Although the Federal Circuit validity statistic has moderated somewhat over time—more recent studies place the Federal Circuit validity rate at about 55 to 60%—still almost twice the previous rate.¹⁵ The consequence of the lowered standards for

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10. A fourth change was the imposition by the Federal Circuit of the “clear and convincing evidence” standard for overcoming the presumption of validity provided by 35 U.S.C. § 282. This change acted as a signal to district court judges that they were expected to hold patents valid and would be reversed if they did not. It worked! See Matthew D. Henry and John L. Turner, *The Court of Appeals for the Federal Circuit’s Impact on Patent Litigation*, 35 J. LEGAL STUD. 85 (2006), particularly Figure 1 on page 108.
 11. See, e.g., Maurice H. Klitzman, *The Federal Circuit Is Making New Law*, Address at PIPA Congress, Chi., Ill. (Oct. 1985); Martin J. Adelman, *The New World of Patents Created by the Court of Appeals for the Federal Circuit*, 20 U. MICH. J.L. REFORM 979 (1987) (examining the Federal Circuit’s approach to patent issues in its early days).
 12. GLORIA K. KOENIG, *PATENT INVALIDITY: A STATISTICAL AND SUBSTANTIVE ANALYSIS* 4–32, tbl.15 (rev. ed. 1980).
 13. A decision by a court that a patent is invalid is a determination that it does not comply with statutory requirements. See 35 U.S.C. § 282 (2006). It is also a determination that the patent never should have been granted by the U.S. Patent and Trademark Office, which is charged, in the first instance, with determining whether a patent application complies with the statutory requirements. See 35 U.S.C. §§ 131–133 (2006).
 14. Jerome Lee, Senior Partner, Morgan & Finnegan, *The Most Significant Patent Cases Relating to the Question of Obviousness Under 35 U.S.C. Sec. 103*, Address at the Annual Meeting of the American Bar Association, Aug. 12, 1986.
 15. John R. Allison & Mark A. Lemley, *Empirical Evidence on the Validity of Litigated Patents*, 26 AIPLA Q.J. 185 (1998); Mark A. Lemley, *An Empirical Study of the Twenty-Year Patent Term*, 22 AIPLA Q.J. 369 (1994).

innovators was that their innovations were suddenly at risk from the newly valid patents that would have been invalid under the prior, higher standards.

A. The Federal Circuit's Changes

The lowered standards for patentability were brought about by the Federal Circuit by two concurrent changes in the application of the nonobviousness requirement,¹⁶ which the Supreme Court had prescribed in *Graham v. John Deere Co. of Kansas City* and *United States v. Adams*,¹⁷ and subsequently reiterated in *Anderson's-Black Rock v. Pavement Salvage Co.*,¹⁸ *Dann v. Johnston*,¹⁹ and *Sakraida v. Ag Pro, Inc.*²⁰

1. Change One: "Person of Ordinary Skill in the Art"

The first of the changes by the Federal Circuit involved the hypothetical "person of ordinary skill in the art." In the Supreme Court cases, the person of ordinary skill in the art is someone of intelligence and imagination who kept himself or herself informed of developments pertinent to his or her work. In *Graham*, the Court stated, "[t]he ambit of applicable art in given fields of science has widened by disciplines unheard of a half century ago. It is but an evenhanded application to require that those persons granted the benefit of a patent monopoly be charged with an awareness of these changed conditions."²¹

This person is to be contrasted with the person of ordinary skill in the Federal Circuit cases who is said to be: "[o]ne who thinks along the line of

16. The patent statute, 35 U.S.C. § 103(a) (2006), provides, in part, that "[a] patent may not be obtained . . . if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious . . . to a person having ordinary skill in the art . . ."

17. In *Graham v. John Deere Co. of Kan. City*, 383 U.S. 1 (1966), and *United States v. Adams*, 383 U.S. 39 (1966), decided by the Supreme Court on the same day in 1966, the Court prescribed the statutory test for determining whether an invention has met the nonobviousness requirement of 35 U.S.C. § 103. The statutory test required a three-step factual analysis that consisted of: (1) determining the scope and content of the prior art, (2) ascertaining the differences between the prior art and the claims at issue, and (3) resolving the level of ordinary skill in the pertinent art. The question of obviousness or nonobviousness is resolved against this factual background. *Graham*, 383 U.S. at 17.

18. *Anderson's-Black Rock, Inc. v. Pavement Salvage Co.*, 396 U.S. 57 (1969).

19. *Dann v. Johnston*, 425 U.S. 219 (1976).

20. *Sakraida v. Ag Pro, Inc.*, 425 U.S. 273 (1976).

21. *Graham*, 383 U.S. at 19.

conventional wisdom . . . and is not one who undertakes to innovate.”²² The Federal Circuit’s “person of ordinary skill” apparently is a literalist, without imagination or creativity, unaware of developments pertinent to his or her work. He or she is incapable of considering collectively the combined teachings of relevant prior art unless “motivated” to do so by explicit directions in the prior art references themselves.²³ The Federal Circuit’s requirement for “motivation” is absent from the Supreme Court cases, which assume that the person of ordinary skill has sufficient imagination to consider collectively the teachings of relevant art, even if the references themselves do not suggest that they be considered together.²⁴

This change by the Federal Circuit has narrowed the scope of prior art to be considered and has rendered patentable inventions that once could not have been the subject of a valid patent. The effect is tantamount to having read § 103, the nonobviousness requirement, out of the statute, and to have made patentable all inventions that are not “identically described or disclosed” in a single reference. A consequence is that the Federal Circuit regularly upholds the validity of patents on inventions that are no more than routine applications of textbook principles of science and engineering.²⁵

22. *Standard Oil Co. v. Am. Cyanamid Co.*, 774 F.2d 448, 454 (Fed. Cir. 1985).

23. For Federal Circuit “motivation” cases, see, for example, *Medtronic v. Cardiac Pacemakers*, 721 F.2d 1563, 1575 (Fed. Cir. 1983), *Lindemann Maschinenfabrik GmbH v. Am. Hoist and Derrick*, 730 F.2d 1452, 1462 (Fed. Cir. 1984), *ACS Hosp. Sys. v. Montefiore Hosp.*, 732 F.2d 1572, 1577 (Fed. Cir. 1984), *Panduit v. Dennison Mfg.*, 774 F.2d 1082, 1094 (Fed. Cir. 1985), *Ashland Oil v. Delta Resins & Refractories*, 776 F.2d 281, 293 (Fed. Cir. 1985), *Ecolochem v. S. Cal. Edison*, 227 F.3d 1361, 1372 (Fed. Cir. 2000), *Cardiac Pacemakers v. St. Jude Med.*, 381 F.3d 1371, 1376 (Fed. Cir. 2004), and *Teleflex, Inc. v. KSR Int’l*, 119 F. App’x 282, 284 (Fed. Cir. 2005).

24. See *Dann v. Johnston*, 425 U.S. at 219, in which the Court said, “it can be assumed that such a hypothetical person would have been aware both of the nature of the extensive use of data processing systems in the banking industry and of the system encompassed in the Dirks patent,” (emphasis added) even though there was no such suggestion in the Dirks patent. By contrast, under Federal Circuit decisions, motivation is a factual issue for trial by a jury that must be proven by clear and convincing evidence. See, e.g., *Group One Ltd. v. Hallmark Cards, Inc.*, 407 F.3d 1297, 1304–05 (Fed. Cir. 2005); *McGinley v. Franklin Sports, Inc.*, 262 F.3d 1339, 1351 (Fed. Cir. 2001). The Supreme Court granted certiorari in the *Teleflex, Inc. v. KSR Int’l* case on June 26, 2006 to consider whether the Federal Circuit has erred in imposing its “teaching, suggestion, or motivation” test.

25. See, for example, *Warner-Jenkinson v. Hilton Davis Chem.*, 520 U.S. 17 (1997), (which went to the Supreme Court on a “doctrine of equivalents” issue) that involved a patent for the use of a commercially available filter in an ultrafiltration method for filtering dyes, *Ecolochem*, 227 F.3d 1361, which involved a patent on the use of an ion exchange resin to deionize water, and *Teleflex*, 119 F. App’x 282, which involved the use with an adjustable accelerator pedal of an electronic position sensor that previously had been used with a non-adjustable accelerator pedal.

2. Change Two: "Increased Uncertainty"

The second of the Federal Circuit changes bearing on the standard for patentability is the elevation of nonstatutory factors, the so-called "secondary considerations," from a position of conditional relevance under the Supreme Court cases, where they were to be considered *only* if doubt remained after application of the three-step statutory test, to primary factors that are always relevant and always must be considered,²⁶ and which, if sufficiently present, can even render patentable inventions that are otherwise obvious by the statutory test.²⁷

This second change by the Federal Circuit has also had substantial business repercussions. By mandating consideration of the nonstatutory secondary factors while prescribing that the evidence be considered "collectively," whatever that may mean, as the test for weighing the newly relevant nonstatutory factors against a determination of obviousness under the statutory test,²⁸ the Federal Circuit has injected additional uncertainty into the evaluation of patents.²⁹ Thus, one cannot know in the absence of

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26. See *Stratoflex v. Aeroquip*, 713 F.2d 1530, 1538–39 (Fed. Cir. 1983); *Fromson v. Advance Offset Plate*, 755 F.2d 1549, 1557 (Fed. Cir. 1985). *Grain Processing v. Am. Alcolac*, 383 U.S. at 17, *Adams*, 383 U.S. at 52, and subsequent Supreme Court and regional Court of Appeals cases made it plain that nonstatutory factors, the so-called "secondary considerations," are only of conditional relevance in ascertaining whether the nonobviousness requirement has been met and are to be considered only if there is doubt after application of the three-step statutory test. See also Dorothy Whelan, *A Critique of the Use of Secondary Considerations in Applying the Section 103 Nonobviousness Test for Patentability*, 28 B.C. L. REV. 357 (1987); Robert P. Merges, *Commercial Success and Patent Standards: Economic Perspectives on Innovation*, 76 CAL. L. REV. 803 (1988).
27. No amount of "secondary considerations" could overcome a determination of obviousness under the three-step statutory test prescribed in the Supreme Court cases. This is not true of Federal Circuit cases which have ruled that evidence of secondary considerations must always be considered, and "may . . . establish that an invention appearing to have been obvious in light of prior art was not." *Stratoflex*, 713 F.2d at 1538, quoted in *Alco Standard Corp. v. Tenn. Valley Auth.*, 808 F.2d 1490, 1501 (Fed. Cir. 1986) (omission in original). See *Demaco v. F. Von Langsdorff Licensing Ltd.*, 851 F.2d 1387, 1391 (Fed. Cir. 1988); *Simmons Fastener v. Ill. Tool Works*, 739 F.2d 1573, 1575–76 (Fed. Cir. 1984); see also Robert W. Harris, *The Emergency Primacy of "Secondary Considerations" as Validity Ammunition: Has the Federal Circuit Gone Too Far?*, 71 J. PAT. & TRADEMARK OFF. SOC'Y 185 (1989).
28. See *Simmons Fastener*, 739 F.2d at 1576. As with the motivation inquiry, the Federal Circuit has ruled that juries are properly entrusted with weighing and balancing primary and secondary factors bearing on patentability. *Hallmark*, 407 F.3d at 1304–06, *McGinley*, 262 F.3d at 1351.
29. Glynn S. Lunney, Jr., *Patent Law, the Federal Circuit, and the Supreme Court: A Quiet Revolution*, 11 SUP. CT. ECON. REV. 1, 76 (2004), concludes that "the Federal Circuit and its doctrinal changes have brought less certainty and predictability to patent enforcement."

litigation and appeal to the Federal Circuit whether a patent that is obvious under the three-step statutory test is nonetheless valid because of the presence of some undefined quantum of nonstatutory secondary factors. This change, by compounding the number of issues required to be discovered and tried, not only added uncertainty and lowered the standards for patentability, but it also increased the cost and complexity of patent litigation.

Judge Easterbrook of the 7th Circuit Court of Appeals and the University of Chicago, said in his famous Texas Law Review article on antitrust, with respect to the antitrust Rule of Reason:

When everything is relevant, nothing is dispositive. Any one factor might or might not outweigh another, or all of the others, in the fact finder's contemplation. The formulation offers no help to businesses planning their conduct. Faced with a list of such imponderables, lawyers must engage in ceaseless discovery. (They might find something bearing on a factor, and the factor might be dispositive.) The higher the stakes, the more firms are willing to spend on discovery and litigation. The marginal week of discovery or trial just might mean saving a few millions or tens of millions of dollars. Litigation costs are the product of vague rules combined with high stakes, and nowhere is that combination more deadly than in antitrust litigation under the Rule of Reason.³⁰

This statement is equally applicable to patent litigation and the standardless, everything-relevant inquiry mandated by the Federal Circuit for the obviousness-nonobviousness question.

An additional substantive change to patent standards that has led to increased uncertainty is in the area of claim construction.³¹ The Supreme Court in *Markman v. Westview Instruments, Inc.* affirmed a Federal Circuit decision that claim construction is a question of law for judges.³² As a result, district court judges began holding what are known as “Markman hearings” to construe patent claims.

30. Frank H. Easterbrook, *The Limits of Antitrust*, 63 TEX. L. REV. 1, 12–13 (1983).

31. The patent statute, in 35 U.S.C. § 112 (2004), requires that “[t]he specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.”

32. *Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 388 (1996).

Unfortunately for the district court judges, as well as those who had hoped this decision would bring clarity, the Federal Circuit accords no deference to claim construction decisions by district court judges, and treats such decisions as purely “legal” in nature, subject to de novo review at the Federal Circuit.³³ This has led many district court judges to hold only perfunctory “Markman hearings” since the Federal Circuit treats them as if they had never taken place.³⁴ Professor Merges, a patent scholar at the University of California, Berkeley’s Boalt Hall School of Law, has suggested that claim construction may be a more difficult task than previously thought.³⁵ Another possibility is that claims susceptible to multiple interpretations are ambiguous, and the patents containing them should have been declared invalid for failing to comply with the § 112 requirement that patent claims particularly point out and distinctly claim the subject matter the applicant regards as his or her invention.

The Federal Circuit’s mandated consideration of the “secondary factors” and its inability to articulate clear rules for claim construction have increased the uncertainty that pervades U.S. patent law.³⁶ A legal regime is supposed to inform those affected by it of their rights and duties in advance so they can act accordingly. Our current system of patent laws fails that test. That failure is illustrated by the *Polaroid Corp. v. Eastman Kodak Co.*³⁷ patent infringement case. Kodak was found to have followed “a patent clearance process that could serve as a model for what the law requires.”³⁸ Yet, Kodak lost on seven of the twelve Polaroid patents in suit; uncertainty has certainly triumphed when the best a “model process” can achieve is a 42% accuracy rate.

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33. Margaret C. Fisk, *Confusion Follows '96 Landmark Patent Case: "Markman" Didn't Turn Out As Most Predicted*, NAT'L L.J., June 15, 1998, at A1 (stating that a 1998 report indicates that the Federal Circuit reversed 40% of district court claim-construction decisions). In addition, it was reported that the Federal Circuit reversed, in whole or in part, 53% of patent-infringement decisions by district court judges. *Id.* Forty percent is consistent with figures reported in Judge Rader’s dissenting opinion in *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448 (Fed. Cir. 1998) (Rader, J., dissenting), and in the certiorari petition filed on behalf of American Axle in *Dana Corp. v. Am. Axle & Mfg., Inc.*, 100 F. App’x 871 (E.D. Mich. Oct. 28, 2003).
34. Victoria Slind-Flor, “Markman” Precedent Holds Up Patents: Ruling Intended to Add Predictability and It Fails to Do So, NAT'L L.J., Jan. 15, 2001, at A1.
35. Professor Merges is the author of *As Many as Six Impossible Patents Before Breakfast: Property Rights for Business Concepts and Patent Reform*, 14 BERKELEY TECH. L.J. 577 (1999).
36. Lunney, Jr., *supra* note 29.
37. *Polaroid Corp. v. Eastman Kodak Co.*, 1990 U.S. Dist. LEXIS 17968; 16 U.S.P.Q.2d 1481 (D. Mass. Oct. 12, 1990).
38. *Id.* at 1538.

3. Change Three: Excessive Patent Damages

The third area of change by the Federal Circuit that affects innovation has been the proliferation of excessive damages for patent infringement. The patent damages statute, 35 U.S.C. § 284, provides that patent-infringement damages are to be “adequate to compensate for the infringement, but in no event less than a reasonable royalty.” In *Aro Mfg. Co. v. Convertible Top Replacement Co.*, the Supreme Court told us this means that patent damages are to be: “the difference between [the patentee’s] pecuniary condition after the infringement, and what his [pecuniary] position would have been if the infringement had not occurred.”³⁹ That is to say the object of the patent damages statute is to restore the patentee to the position he or she would have enjoyed had there been no infringement. Nonetheless, damages determined in accordance with decisions of the Federal Circuit frequently place the patentee in a better position than if the infringement had never occurred. This is unambiguously incongruent with the statute.

Just one example should suffice. Federal Circuit cases require that the patentee recover lost-profits damages on the infringer’s sales the patentee would have made in the absence of the infringement (i.e., on the “but for” assumption that the infringer was absent from the market). In addition, the Federal Circuit requires an award of reasonable royalty damages on the infringer’s sales the patentee could not have made (i.e., on the contrary “but for” assumption that the infringer was present in the market and licensed by the patentee).⁴⁰ This “but-for” world in which the alleged infringer is simultaneously absent from and present in the market is not at all like the real world, which the Supreme Court in *Aro* said we are supposed to emulate. Licensing and not licensing are mutually exclusive, and the patentee does one or the other, but not both simultaneously.

A damages rule that would emulate the real world in accordance with *Aro* would award the patentee his or her lost profits on lost sales, *or* a reasonable royalty on all of the infringer’s sales, whichever is greater. It would not award some combination of the two that is larger than either and which puts the

39. *Aro Mfg. Co. v. Convertible Top Replacement Co.*, 377 U.S. 476, 507 (1964) (quoting *Yale Lock Mfg. Co. v. Sargeant*, 117 U.S. 536, 552 (1886)).

40. Federal Circuit combined award cases include (but are not limited to) *Gyromat Corp. v. Champion Spark Plug Co.*, 735 F.2d 549, 551 (Fed. Cir. 1984); *Bio-Rad Laboratories, Inc. v. Nicolet Instrument Corp.*, 739 F.2d 604, 615–16 (Fed. Cir. 1984); *Radio Steel & Mfg. Co. v. MTD Products, Inc.*, 788 F.2d 1554, 1555 (Fed. Cir. 1986); *Amstar Corp. v. Envirotech Corp.*, 823 F.2d 1538 (Fed. Cir. 1987); *State Industries, Inc. v. Mor-Flo Industries, Inc.*, 883 F.2d 1573, 1577–80 (Fed. Cir. 1989), *cert. denied*, 493 U.S. 1022 (1990).

patentee in a better financial position than if the infringement had never occurred, as Federal Circuit decisions mandate.⁴¹

The *Polaroid v. Kodak* damages award is illustrative, as it combined lost profits and reasonable royalty damages as mandated by Federal Circuit decisions. The completeness of District Judge Mazzone's findings permits the excess to be determined.⁴² A compensatory damages award would have been about \$197 million, based on a reasonable royalty on all of Kodak's sales at the royalty rate the court said would have been acceptable to Polaroid, since such award was more than an award based on Polaroid's lost profits from its lost sales. However, the district court believed it was required by Federal Circuit decisions to award damages that combined lost profits *and* reasonable royalties (and to impose a higher royalty rate than it said would have been acceptable to Polaroid), and the final judgment was for \$873 million (\$437 million damages, \$436 million prejudgment interest).⁴³ The difference between \$873 million and the \$197 million that would have been adequate to compensate Polaroid is a real windfall, and it gives patentees a tremendous incentive to sue rather than settle. The undoubted consequence is that a lot of patent infringement suits that should have settled, or never been brought at all, were pursued by patentees hoping to "win the lottery."⁴⁴

B. The Effects of the Federal Circuit's Changes

With the advent of the Federal Circuit and the lowered standards brought by it, innovators could no longer rely on the courts to protect them from patent harm. Instead they had to engage in "self help" and seek patents on

41. Other examples of excessive damages awards can be found in Mark Lemley and Carl Shapiro, Patent Holdup and Royalty Stacking, presented August 11, 2006 by Professor Lemley at the 2006 Intellectual Property Scholars Conference at the Berkeley Center for Law and Technology, available from the Social Science Research Network at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=923468.

42. See Cecil D. Quillen, Jr., *Innovation and the United States Patent System Today*, Address at ABA Continuing Legal Education Institute, Antitrust and Intellectual Property: Practice and Policy Issues for the 1990s. (Oct. 19, 1992) available at <http://www.ftc.gov/os/comments/intelpropertycomments/quillenattachments/innovation.pdf>, for a complete analysis of the Polaroid damages award.

43. *Polaroid Corp. v. Eastman Kodak Co.*, 1991 U.S. Dist. LEXIS 344; 17 U.S.P.Q.2d 1711 (D. Mass. Jan. 11, 1991).

44. See Vincent E. O'Brien, *Economics and Key Patent Damages Cases*, 9 U. BALT. INTELL. PROP. L.J. 1 (2000) for a comprehensive critique of one facet of the Federal Circuit damage law economics. See Cecil Quillen, *Income, Cash and Lost Profits Damages Awards in Patent Infringement Cases*, 2 FED. CIR. B.J. 201 (1992).

their once-unpatentable inventions in the hope of preempting or blocking others.

In general, innovator companies would file patent applications for their inventions on which it was believed patents could be obtained and which they might use commercially,⁴⁵ or which their competitors might use commercially to compete with them. These, after all, are the only patents of value to a company whose business depends on innovation, and whose object is to offer new innovations with as little interference as possible from others' patents—the logic for defensive patenting. Below is a chart that illustrates the foregoing, i.e., that such a company should choose to seek patents on those of its inventions on which patents can be obtained and that it might use commercially, or that its competitors might use commercially to compete with it.

45. This would include inventions their customers might use commercially employing products supplied by the innovator.

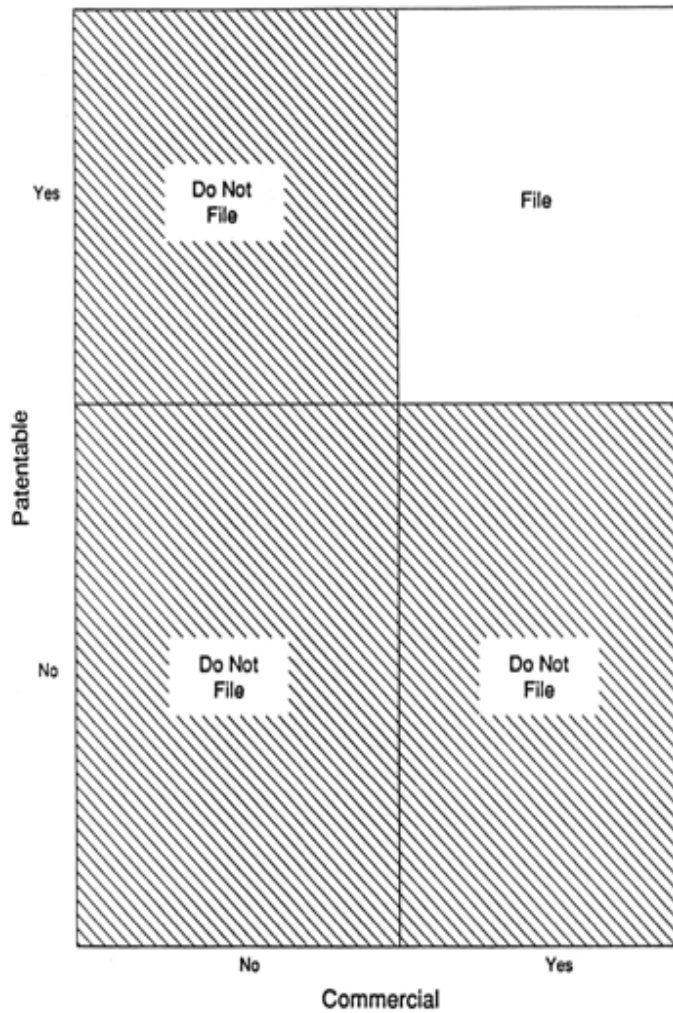


Chart One

This second chart below clearly illustrates the shift brought about by the Federal Circuit's lowered standards. And, as shown on this second chart, as the standards came down and more inventions became patentable, a "patentability gap" was created, and it became necessary for innovator companies to seek patents on their once-unpatentable inventions in their

effort to preempt competitors and to block them from obtaining patents that could impede their innovations.

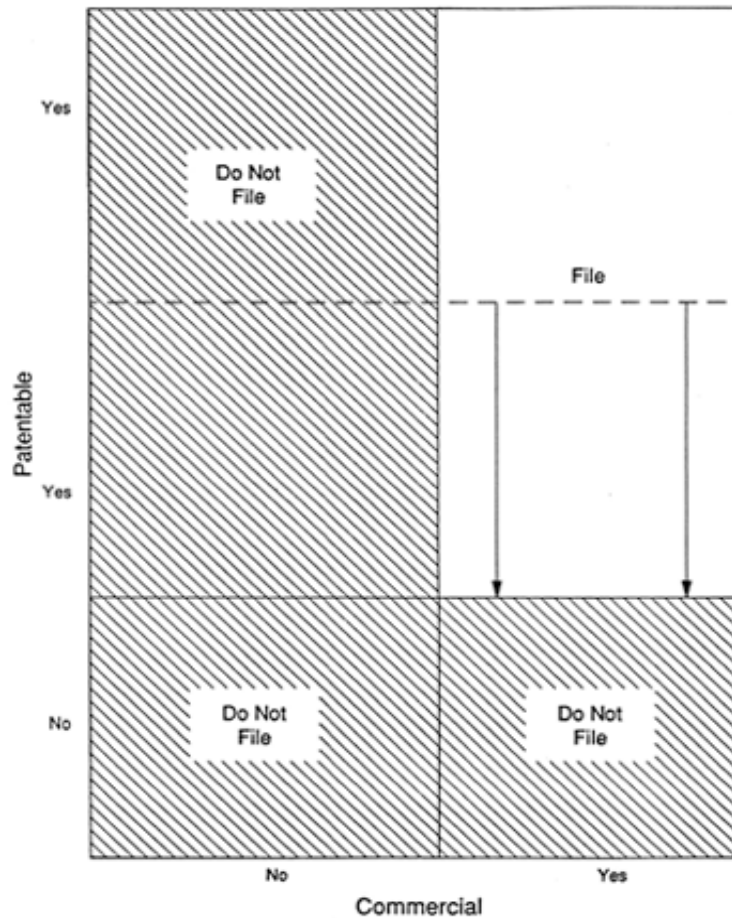
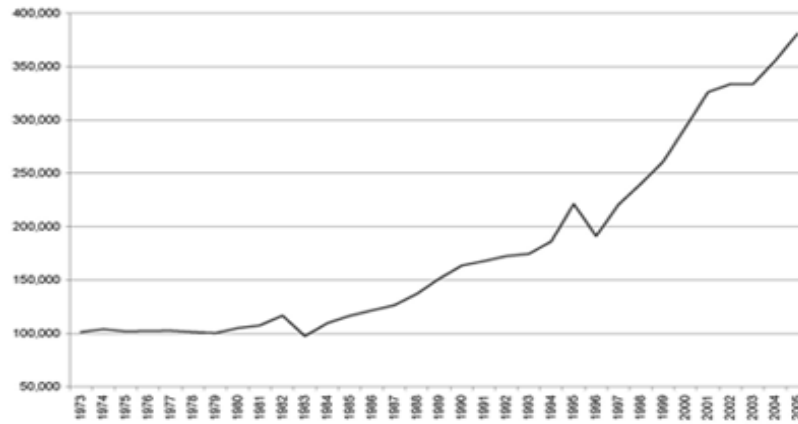


Chart Two

Their competitors, though, had the same necessity to seek and obtain patents on their once unpatentable inventions. As a consequence, all filed more patent applications, all obtained more patents, and all had higher costs. Yet, no one obtained an advantage.

The increase in applications filed and patents granted after the creation of the Federal Circuit in 1982 is quite dramatic, as the charts below reveal. In the

1970s through the early 1980s, patent applications consistently hovered in the 100,000 range, while the number of patents granted fluctuated between 50,000 and 75,000. Starting in 1983, however, the number of patent applications skyrocketed, reaching over 150,000 by 1990 and 409,000 in 2005. The number of patents issued has similarly risen. Clearly the “patent thicket” has thickened.



*Chart Three: U.S. Applications Filed (1973–2005)*⁴⁶

46. Underlying data were compiled by the Author from the workload tables included in the annual reports of the U.S. Patent and Trademark Office.



Chart Four: U.S. Application Allowances and Patent Grants (1973–2005)⁴⁷

The increased numbers of patents resulting from the increased filings and lowered standards mean that innovators are more likely to encounter others' patents in the course of commercializing their innovations.⁴⁸ This requires more infringement studies,⁴⁹ more validity investigations, more consultations with outside patent advisers, and, of course, more licensing, since patents that once could safely have been disregarded as not infringed or invalid can no longer be ignored.⁵⁰ And sometimes it has meant no new products or processes, because a license is unavailable or too costly, even though the

47. *Id.*

48. The decline in allowances and grants after 2003 is not a consequence of increased rigor at the USPTO but rather reflects an increase of more than 200,000 in the USPTO backlog of pending applications, from 674,691 in 2003 to 885,002 in 2005. See *Summary of Patenting Examining Activities*, 2005 USPTO PERFORMANCE & ACCOUNTABILITY REP. FISCAL Y. 2005, 118 tbl. 1; *Patents Pending Prior to Allowance*, 2005 USPTO PERFORMANCE & ACCOUNTABILITY REP. FISCAL Y. 2005, 120 tbl. 3.

49. In some industries this task has become so overwhelming that infringement studies are seldom done in the expectation that the threat of reciprocal litigation can induce cross-licensing if infringement issues ever arise. See Bronwyn H. Hall & Rosemarie Ham Ziedonis, *The Patent Paradox Revisited: An Empirical Study of Patenting in the U.S. Semiconductor Industry 1979–1995*, 32 RAND J. ECON. 101 (2001).

50. *Id.* at 109. In the semiconductor industry studied by Hall and Ziedonis, bilateral field-of-use portfolio cross-licenses are frequently used to eliminate patent issues in advance. Such cross-licensing is employed in other industries as well. The effect of such bilateral field-of-use cross-licenses is to render the patent system irrelevant, at least for a time, as between the parties to the cross-licenses.

blocking patent is one that would have been invalid under the prior, higher standards.

The overall result of the lowered standards is increased costs for innovators. In order to obtain more patents and conduct more infringement and validity studies, one has to employ more patent attorneys. More frequent consultations with outside patent advisers mean higher legal fees. And to take (and grant) more licenses, one has to increase the size of one's licensing staff and pay more and larger licensing fees. Moreover, one likely has to defend more infringement suits as well.

There are also increased costs for innovators attributable to the increased uncertainty. Of the two principal increased cost effects attributable to the increased uncertainty, one is easily quantifiable and the other, the larger of the two, is not so easily quantifiable. The more easily quantifiable of the two is the increase in the amount and cost of patent litigation, since answers to many questions critical for determination of whether patents are valid and infringed are unknown in the absence of litigation and appeal to the Federal Circuit. That uncertainty, and the risk of excessive, possibly crippling damages, combine to make patent lawsuits and threats thereof frequent instruments of extortion.

Merz & Pace documented this increase in patent litigation and tied it directly to the Federal Circuit.⁵¹ Before 1982, the number of patent litigation case filings was relatively stable at about 70 cases per month, or about 850 cases per year.⁵² However, immediately after the Federal Circuit came into existence, the number of patent cases filed rose substantially, and has continued to rise, reaching nearly 3,000 per year in 2005. The costs of this increased litigation manifest themselves as increased costs for innovation.

The second and larger effect that is more difficult to quantify is the increased cost of capital for innovation investments because of the additional uncertainty. Financial markets deal with risk and uncertainty through the cost of capital, which is higher for risky, uncertain projects than for less risky, more certain projects. For some projects the risk and uncertainty are so great that the cost of capital exceeds the expected return, and the project is not undertaken at all.

Polaroid v. Kodak illustrates the effect of patent uncertainty on the cost of capital. The case was bifurcated with liability decided in 1985, five years

51. Jon F. Merz & Nicholas M. Pace, *Trends in Patent Litigation: The Apparent Influence of Strengthened Patents Attributable to the Court of Appeals for the Federal Circuit*, 76 J. PAT. & TRADEMARK OFF. SOC'Y 579, 584 (1994).

52. *Id.*

before the initial damages judgment in 1990.⁵³ During this five-year period, there was uncertainty as to the amount Kodak would be required to pay. The damages judgment was announced in 1990 at \$909 million (later reduced to \$873 million), and the equity market value of Kodak immediately *increased* by \$921 million, \$12 million more than the announced amount of the judgment.⁵⁴

Thus elimination of uncertainty as to the amount of damages Kodak would be required to pay was followed by an immediate increase in Kodak's equity value, and a corresponding decrease in the cost of Kodak's equity capital. Given that Kodak's equity was valued at \$11.2 billion immediately prior to the judgment, this was a decrease of about 8% in the cost of Kodak's equity capital. Imagine the savings if Kodak's cost of capital had been 8% less for the entire fifteen years the Polaroid litigation was pending, or even the five-year interval between the liability judgment and the initial damages decision. These are astonishing sums and give some appreciation of the additional cost of capital for innovation investments caused by the uncertainty that pervades our present patent system.

The consequence of increased innovation costs can be illustrated with fundamental economic principles. By increasing the cost of innovation, we get less innovation and it costs us more. In terms of the conventional supply (marginal cost) and demand curves, the increased innovation costs raise the marginal cost (supply) curve for innovation. The consequence is that the intersection of the marginal cost (supply) and demand curves is shifted up and to the left. This new intersection of the demand and marginal cost (supply) curves occurs at a reduced quantity and a higher cost or price. In other words, our patent system, by imposing unnecessary costs on innovation, reduces the amount of innovation we get while costing us more.

C. How Did We Get Here?

How did the U.S. patent system reach this point? To answer this, we need to go back long before the creation of the Federal Circuit. There has always been a symbiotic relationship between the U.S. Patent and Trademark Office (USPTO) and those who practice before it: each has depended on the other for their livelihoods. Each year the USPTO issued a few more patents, which

53. *Polaroid Corp. v. Eastman Kodak Co.*, 1990 U.S. Dist. LEXIS 17968; 16 U.S.P.Q.2d 1481 (D. Mass. Oct. 12, 1990).

54. Paula Demasi, *Essays on the Effects of Public Policy*, at 50 (May, 1991) (Ph.D. dissertation, Harvard University, Department of Economics, published by UMI Dissertation Services, Ann Arbor, Michigan) (on file with author).

required a few more patent applications, which required a few more patent attorneys and patent examiners, and so on. The number of patent applications (and issued patents) grew gradually from 1840 until about 1982, when the Federal Circuit came into existence, and then rose dramatically following the advent of the Federal Circuit in 1982.⁵⁵ The gradual increase in the number of patents and patent applications and the consequent growth in the need for more patent attorneys and patent bureaucrats and patent examiners assured job security and attractive incomes for all; and it also assured that none had the slightest interest in changing the system.

The Supreme Court and the Courts of Appeals, however, applied substantially higher standards than the USPTO, and regularly admonished the USPTO to follow suit. The Supreme Court's admonition in *Graham* is typical:

We have observed a notorious difference between the standards applied by the [USPTO] and by the courts. While many reasons can be adduced to explain the discrepancy, one may well be the free rein often exercised by Examiners in their use of the concept of "invention." In this connection we note that the [USPTO] is confronted with a most difficult task. Almost 100,000 applications for patents are filed each year. Of these, 50,000 are granted and the backlog now runs well over 200,000. (Citation omitted). This is itself a compelling reason for the Commissioner to strictly adhere to the 1952 Act as interpreted here. This would, we believe, not only expedite disposition but bring about a closer concurrence between administrative and judicial precedent.⁵⁶

Such judicial admonitions hung like a "Sword of Damocles" over the "patent crowd": the patent attorneys and patent bureaucrats and patent examiners whose jobs and incomes depended on filing patent applications and granting patents. Had the USPTO ever followed the Supreme Court's admonition and strictly adhered to the 1952 Act as interpreted in *Graham*, the number of patents would have been reduced, perhaps by as much as two-thirds, with the consequence that the number of patent applications soon would have been reduced by a similar amount.⁵⁷ With fewer patent

55. See *supra* note 46.

56. *Graham v. John Deere Co. of Kan. City*, 383 U.S. 1, 18–19 (1966).

57. Recall the 65.7% patent invalidity rate from 1953 through 1977. KOENIG, *supra* note 12, at 4–32.

applications, the number of patent attorneys, patent bureaucrats, and patent examiners would have been reduced as well.

But opportunity presented itself in 1978 with the creation in the Justice Department of the Office for Improvements in the Administration of Justice (OIAJ) and the proposal to merge the Court of Customs & Patent Appeals (CCPA) and the Court of Claims into a new Federal appellate court with exclusive jurisdiction over all patent appeals.⁵⁸ The CCPA heard appeals from the USPTO, and had always managed to ignore the high standards prescribed by the Supreme Court. As the proposal progressed, all cases except patent appeals and a few specialized areas of federal law escaped the jurisdiction of the proposed new appellate court.

To some extent, the patent bar was split over the proposed new court. On one hand, the Washington, D.C. patent bar and most corporate patent attorneys (who for the most part determined the positions of their employers) were strongly in favor of the proposed new court.⁵⁹ These were the people who made their livings by practicing before the USPTO, and whose incomes were most in jeopardy if the USPTO ever followed the Supreme Court's admonitions. But, if the new court turned out to be dominated by the CCPA, then it, too, might evade the Supreme Court's high standards, with the likely result that there would no longer be judicial pressure on the USPTO to adopt higher standards.

On the other hand, private patent practitioners outside of Washington, D.C., who litigated patent cases in the regular Circuit Courts of Appeals, were less enthusiastic. The chairman of the ABA Litigation Section characterized the proposal for a specialist patent court as “[a] solution in search of a problem.”⁶⁰ And there was a concern that creating such a court in Washington, D.C. might make Washington, D.C. the center of the “patent universe,” to the disadvantage of those living elsewhere.

58. See Commission on the Revision of the Federal Court Appellate System: Structure and Internal Procedures: Recommendations for Change, 67 F.R.D 195 (1975). The Hruska Commission, created in 1972 to study the federal appellate system, had strongly recommended against creation of a specialized patent appeals court. *Id.*; F. M. Scherer, *The Political Economy of Patent Policy Reform in the United States* 22 (AEI-Brookings Joint Ctr. for Regulatory Studies, Working Paper No. 06-22, 2006). Proponents of such a specialized patent appeals court, who were unsuccessful before the Hruska Commission, renewed their efforts when the OIAJ was created. *Id.*

59. Scherer, *supra* note 58, at 22 (pointing out that 76 of the 85 letters submitted by corporations in support of creating the Federal Circuit were signed by patent attorneys).

60. *Id.* at 21. The American Bar Association created committees to consider the proposal for a centralized patent appeals court. At the plenary meeting in February 1980 a majority of the members present opposed such a court. *Id.*

The debate, of course, was not conducted in such crass terms. The proponents pointed to circuit-to-circuit variations in the outcome of patent cases, and even claimed, albeit incorrectly, that there was one circuit that had never found a patent valid.⁶¹ Neither the variation in outcomes nor the possibility of the absence of a valid patent in one of the circuits should have been surprising given that there was very little patent litigation in those days. With only about one-third of litigated patents being found valid, there just were not enough valid patents to go around among the eleven Circuit Courts of Appeals then existing.

Another claim by the proponents of the new court was that circuit-to-circuit variations led to forum shopping, which resulted in “unseemly” races to the courthouse, that would be eliminated by creation of a single appellate court for patent cases. This assertion was untrue; forum shopping was not a problem.⁶² Even if forum shopping had been a problem, it could have been remedied by amending the jurisdiction, venue, and declaratory judgment statutes, rather than creating a new court. This assertion has turned out to be among the most persistent of the propaganda “spun” by the proponents of the combined specialist court, and even today is repeated by people who should know better.⁶³

A third claim by the proponents of the Federal Circuit was that the Supreme Court had paid insufficient attention to patent law.⁶⁴ This, too, was

61. There was never any showing that the variability in outcomes was anything other than normal statistical variation.

62. The 10th Circuit was the most favorable to patentees with a 59.6% validity rate and the 8th Circuit was the most favorable to alleged infringers with an 88.8% invalidity rate. Had forum shopping been a problem, these two circuits would have been swamped with patent litigation initiated by patentees and alleged infringers seeking the most favorable jurisdictions for their cases. But these two courts had fewer patent validity-invalidity decisions over the 1953–1977 time span than any other court except the Circuit Court for the District of Columbia. Together the 8th Circuit and 10th Circuit had only 8% of the validity decisions. (8th Circuit, 4.1%, 10th Circuit, 3.9%). KOENIG, *supra* note 12, at 4–32. See also Scherer, *supra* note 58, at 21 (reporting testimony of the ABA Representative “that the forum shopping claim was overblown.”).

63. The Jaffe and Lerner book repeats a fanciful and colorful tale of foot races at the USPTO on issue day when patentees and potential infringers race to be first to the pay phones to instruct their lawyers to file suit. But this did not happen! It was unnecessary for patentees, who had advance notice from the USPTO of the issue date and patent number for their patents, and was legally impossible for potential infringers given the constitutional requirement that there be an actual threat of litigation to support a declaratory judgment action. But the fact that two competent scholars repeat this fiction in a serious book is testimony to the power of the propaganda. JAFFE & LERNER, *supra* note 3, at 9.

64. See Paul M. Janicke, *To Be or Not to Be: The Long Gestation of the U.S. Court of Appeals for the Federal Circuit (1887–1982)*, 69 ANTI-TRUST L.J. 645, 653–54 (2002).

false. The Supreme Court had revisited and reaffirmed the nonobviousness standard of *Graham* and *Adams* on at least three subsequent occasions.⁶⁵ As of 1978, when the OIAJ was formed and proposed formation of the Federal Circuit, there were no significant patent law issues that the Supreme Court had not recently dealt with,⁶⁶ save one or two not yet ripe for Supreme Court review. The “problem” at the Supreme Court for the proponents of the creation of the Federal Circuit was the Supreme Court’s decisions imposing high standards for patentability that were being followed by the Circuit Courts of Appeals, and which, if ever followed by the USPTO, would have resulted in fewer patents and patent applications, and thus less work for them.⁶⁷

The legislation passed and the Federal Circuit began its work on October 1, 1982. It immediately fulfilled the hopes of its proponents: the standards for patentability were promptly lowered, and the “Sword of Damocles” that had threatened the jobs of patent attorneys and patent bureaucrats and patent examiners was removed. The Federal Circuit decisions that mandated consideration of the nonstatutory secondary factors (which introduced additional uncertainty and cost into patent litigation), and that mandated excessive damages awards, assured there would be more patent litigation, and that the litigation would be more complicated and more costly, all to the benefit of patent attorneys, including those outside Washington, D.C. who had feared what the new court might do to them.

Growth in the number of intellectual property lawyers following creation of the Federal Circuit has vastly exceeded growth in research and development expenditures in the United States. Since the advent of the Federal Circuit, the ratio of intellectual property lawyers in the United States to research and development expenditures in the United States has increased from fewer than 50 attorneys per billion R&D dollars to more than 75 attorneys per billion R&D dollars (in 2000).⁶⁸ These additional lawyers are

65. See *Anderson’s-Black Rock, Inc. v. Pavement Salvage Co.*, 396 U.S. 57 (1969); *Dann v. Johnston*, 425 U.S. 219 (1976); *Sakraida v. Ag Pro, Inc.*, 425 U.S. 273 (1976).

66. *Dann*, 425 U.S. 219, and *Sakraida*, 425 U.S. 273 were decided in 1976, only two years prior to the renewed quest for a specialist patent appeals court that resulted in the Federal Circuit.

67. Janicke, *supra* note 64, can be read as a confessional that the “patent crowd” supported the proposed new appellate court in the hope of deliverance from the Supreme Court’s high standards rather than for the reasons given by them at the time, and as an assertion that the new court (the Federal Circuit) ignored (or defied) the Supreme Court as its proponents had hoped. See *id.* at 660–62 (cataloguing Federal Circuit deviations from Supreme Court precedent).

68. See John H. Barton, *Reforming the Patent System*, 287 *SCI.* 1933, 1933–34 (2000). Mr. Barton is the George E. Osborne Professor of Law, Emeritus, at Stanford Law School.

required to file the additional patent applications made necessary by the lowered standards brought to us by the Federal Circuit, to evaluate the increased numbers of patents that result from the lowered standards, and to deal with the additional litigation that results from the additional uncertainty and excessive damages.

The USPTO, with the blessing of the Federal Circuit, has continued to expand the scope of its activities and the job opportunities for its employees, those who practice before it, and those who litigate patents in the courts. There are now patents on computer software per se and business methods solely as a result of administrative and judicial decisions, without any legislative determination that these industries were suffering from a lack of innovation, or that they would benefit from having the patent system and its costs imposed on them.⁶⁹

The USPTO does not set the standards for patentability in the United States, but is obliged to follow those prescribed by the Federal Circuit. Studies by the Author and others tracking examination performance of the USPTO over time found that USPTO examination standards declined rapidly following the advent of the Federal Circuit and the lowered standards promulgated by it.⁷⁰ This is not surprising given the relative roles of the Federal Circuit and the USPTO (the Federal Circuit has appellate supervision over the USPTO), but does suggest that at least some of the current criticism of the USPTO is misplaced and should be directed at the Federal Circuit instead. It also suggests that “fixes” aimed at the USPTO, rather than the Federal Circuit, are likely to be ineffective.

Examination performance at the European Patent Office (EPO) and Japanese Patent Office (JPO) was found to be more rigorous than at the

69. See Robert M. Hunt, *You Can Patent That? Are Patents on Computer Programs and Business Methods Good for the New Economy?* BUS. REV., Q1 2001, available at <http://www.phil.frb.org/files/br/brq101bh.pdf>. For a quantitative assessment of software innovation following the availability of software patents, see James E. Bessen & Eric Maskin, *Sequential Innovation, Patents, and Imitation*, (MIT Dep't of Econ., Working Paper No. 00-01, 2000), available at http://www.papers.ssrn.com/sol3/papers.cfm?abstract_id=206189. (assessing software innovation following the availability of software patents); see also James E. Bessen & Robert M. Hunt, *An Empirical Look at Software Patents*, (Fed. Res. Bank of Phila. Working Paper No. 03-17, 2004), available at http://www.papers.ssrn.com/sol3/papers.cfm?abstract_id=461701.

70. See Cecil D. Quillen, Jr. & Ogden H. Webster, *Continuing Patent Applications and Performance of the U.S. Patent and Trademark Office—Updated*, 16 FED. CIR. B.J. 635 (2006); Cecil D. Quillen, Jr., Ogden H. Webster & Richard Eichmann, *Continuing Patent Applications and Performance of the U.S. Patent and Trademark Office—Extended*, 12 FED. CIR. B.J., 35 (2002); see also Cecil D. Quillen, Jr. & Ogden H. Webster, *Continuing Patent Applications and Performance of the U.S. Patent and Trademark Office*, 11 FED. CIR. B.J. 1 (2001).

USPTO. This too should not be surprising given that standards for patentability in Europe and Japan, which the EPO and JPO, respectively, are obliged to apply, have not been lowered as have standards in the United States. For example, the U.K. House of Lords, in *Sabaf SpA v. MFI Furniture Centres Ltd.*, following European law, applied a patentability analysis virtually identical to that of the U.S. Supreme Court in *Graham, Adams*, and subsequent U.S. Supreme Court cases.⁷¹ A study published in 2004 by the Organisation for Economic Co-operation and Development (OECD) found that during the 1980s and 1990s, grant rates for patent applications filed at both the USPTO and the EPO (i.e., for essentially the same application population) were around 30% higher at the USPTO than at the EPO, suggesting lower patenting requirements in the United States.⁷² These findings of the OECD study are consistent with and confirmed by findings in later studies by Stuart J. H. Graham and Dietmar Harhoff, and by Paul H. Jensen, Alfons Palangkaraya, and Elizabeth Webster.⁷³

The absence from our patent system of the self-correcting structure that applies to other areas of American federal law is also worth noting. Under the normal structure of our federal court system, neither a regional Circuit Court of Appeals nor the district courts within a region are constrained by a decision of another Circuit Court of Appeals. Issues that have been decided by one of the Circuit Courts of Appeals can be reconsidered on their merits when they subsequently arise in another circuit. Eventually, if the Circuit Courts disagree, the Supreme Court can take a case that presents the issue as to which the circuits have split and resolve the matter knowing that all sides of the issue have been debated, that it will hear the most compelling arguments, and will have a reasonable opportunity for reaching the correct result.

71. *Sabaf SpA v. MFI Furniture Centres Ltd.*, 14 Oct. 2004, [2004] UKHL 45, available at <http://www.parliament.the-stationary-office.co.uk/pa/ld200304ldjdgmt/jd041014/sabaf-1.htm>.

72. Org. for Econ. Co-operation and Dev., *Patents and Innovation: Trends and Policy Challenges* (2004), available at <http://www.oecd.org/dataoecd/48/12/24508541.pdf>.

73. Stuart J.H. Graham & Dietmar Harhoff, *Would the U.S. Benefit from Patent Post-grant Reviews? Evidence from a 'Twinning' Study*, (Ctr. for Int'l Bus. Educ. and Res. (CIBER), Ga. Inst. of Tech., Working Paper No. 2005/013-05-06, 2005), available at <http://www.ciber.gatech.edu/workingpaper/2005/013-05-06.pdf> (finding that over 30% of litigated U.S. patents and 40% of non-litigated U.S. patents are not awarded patent protection in Europe); see Paul H. Jensen, Alfons Palangkaraya & Elizabeth Webster, *Disharmony in International Patent Office Decisions*, 16 FED. CIR. B.J. 679 (2006) (finding that only 72.5% of EPO applications and 44.5% of JPO applications corresponding to a selection of about 70,000 U.S. patents were granted by the EPO and JPO, respectively).

However, in our current patent system, once the Federal Circuit has decided a case, there is no opportunity for alternative views to develop free from the constraints of stare decisis, and it is a rare district court judge who will disagree with the Federal Circuit, knowing his or her judgment may be appealed to it. In fact, the Author knows of only one, and it was not a district judge, but rather Judge Easterbrook of the 7th Circuit.

In *Grain Processing Corp. v. American Maize-Products, Co.*, Judge Easterbrook tried the damages part of the case after the death of the district judge who had tried liability.⁷⁴ Judge Easterbrook decided the patentee was not entitled to lost profits, and that the reasonable royalty to which the patentee was entitled should be no more than the additional cost for manufacturing a noninfringing substitute. The case was appealed to the Federal Circuit, which reversed on the basis that the noninfringing substitute was not commercially available to the defendant during the infringement period and did not have all the features of the patented product.⁷⁵

Judge Easterbrook did not follow the Federal Circuit when the case was returned to him. Instead he wrote a second opinion in which, in very polite judge-talk, he said he was right the first time, that the Federal Circuit was wrong in reversing him and did not even understand its own cases, and that he was re-entering his earlier judgment.⁷⁶ The case was appealed again. The second time around, the Federal Circuit, either convinced by Judge Easterbrook's logic or intimidated by his reputation, did not follow its earlier decision, but instead reversed itself and affirmed Judge Easterbrook.⁷⁷ The point, of course, is that U.S. patent law should be given the benefit of the same self-correcting structure that governs other areas of American federal law, and not have to rely on super-courageous district court judges (or Court of Appeals judges sitting by designation) to correct erroneous doctrine promulgated by the Federal Circuit.

74. *Grain Processing Corp. v. Am. Maize-Prods. Co.*, 893 F. Supp. 1386 (N.D. Ind. 1995).

75. *Grain Processing Corp. v. Am. Maize-Prods. Co.*, 1997 U.S. App. LEXIS 2885 (Fed. Cir. 1997).

76. *Grain Processing Corp. v. Am. Maize-Prods. Co.*, 979 F. Supp. 1233 (N.D. Ind. 1997).

77. *Grain Processing Corp. v. Am. Maize-Prods. Co.*, 185 F.3d. 1341 (Fed. Cir. 1999).

II. RECOMMENDATIONS

The Author's recommendations for reforming the U.S. patent system are the following.⁷⁸

1. We need to undo the Federal Circuit's misinterpretations of *Graham*, *Adams*, and the subsequent Supreme Court obviousness-nonobviousness cases, and restore the higher, more certain standards mandated by those cases that prevailed prior to the advent of the Federal Circuit.⁷⁹ We also need to implement economically sound damages law consistent with the Supreme Court's *Aro* decision. The best way for doing these would be to return appellate jurisdiction in patent infringement cases to the regular Courts of Appeals, which are not as likely as the Federal Circuit to ignore Supreme Court precedent.⁸⁰ Such a restoration of appellate jurisdiction to the regular Courts of Appeals would have the additional virtue of returning patent law to the legal mainstream, and patent appeals would again be heard by courts that regularly deal with significant questions of economic policy and thus afford the opportunity for patent policy to be made by judges familiar with a broader economic context. Equally important, the return of appellate jurisdiction to the regular Circuit Courts of Appeals would restore to U.S. patent law the self-correcting judicial structure that governs other areas of federal law, and the Supreme Court could again become the final arbiter of innovation policy involving patents, but would face those issues only after arguments on all sides had been developed and articulated in at least two of the regular Courts of Appeals.

2. The USPTO should be required to adhere to the restored higher standards. The ability of the USPTO to do this would be greatly aided by

78. Many of these recommendations can be found in the Author's earlier article, *Proposal for the Simplification and Reform of the United States Patent System*, 21 AIPLA Q.J. 189, 189–212 (1993).

79. This could happen if the Supreme Court reverses the Federal Circuit in *Teleflex, Inc. v. KSR Int'l Co.*, 119 F. App'x 282 (Fed. Cir. 2005), and imposes the nonobviousness test prescribed in *Graham* and *Adams*. Certiorari was granted on June 26, 2006. Briefs supporting the Petitioner and urging reversal of the Federal Circuit have been filed by numerous Amici, including the Solicitor General on behalf of the United States. Argument is scheduled for November 28, 2006.

80. Craig A. Nard & John F. Duffy, *Rethinking Patent Law's Uniformity Principle*, 101 Nw. U. L. REV. (forthcoming 2007) (proposing a less aggressive solution, namely confer appellate jurisdiction in patent infringement cases on one or more, perhaps two or three, of the existing regular Circuit Courts of Appeals in addition to the Federal Circuit. They also propose that appellate jurisdiction over appeals from the USPTO be conferred on the Circuit Court of Appeals for the District of Columbia in addition to the Federal Circuit).

abolition of all continuing applications and Requests for Continued Examination (RCEs), except for § 121 divisionals, so as to enable the USPTO to obtain final decisions as to the patentability of applications it has examined.⁸¹ Of greater importance, continuing applications are a source of abuses that threaten the integrity of the U.S. patent system and should be abolished for that reason alone.⁸² In addition, changes in management expectations and policies and practices at the USPTO will also be necessary, perhaps even soliciting contributions of used science and engineering textbooks for distribution to and use by the examining corps.

3. We should eliminate remaining sources of unnecessary uncertainty, including:

- i). Return the statutory presumption of validity to the preponderance of the evidence standard that generally prevailed among the regular Circuit Courts of Appeals prior to the advent of the Federal Circuit.⁸³
- ii). Abolish the doctrine of equivalents.⁸⁴

81. Patent applicants in the United States can file later patent applications claiming benefit of the filing date of an earlier patent application so long as the later application is filed before the earlier application is patented or abandoned. And there is no limit on the number of such refilings. Such refiled applications are continuation or continuation-in-part applications pursuant to 35 U.S.C. § 120, Requests for Continued Examination pursuant to rules promulgated under 35 U.S.C. § 132, or divisional applications filed pursuant to 35 U.S.C. § 121. These refiled applications restart the examination process and avoid a final decision as to the patentability of their parent application. The ability to refile and avoid final patentability decisions is unique to the United States, and places the USPTO in the position of being able to rid itself of persistent applicants only by allowing their refiled applications. This may account, at least to some extent, for the high Allowance and Patent Percentages and Grant Rates at the USPTO in comparison to the EPO and JPO. Because the original applications have already been examined by the USPTO, refiled continuing applications are rework for the USPTO. Refiled continuing applications currently comprise more than 30% of the USPTO's examination workload. Abolition of all continuing applications (including RCEs), except for divisional applications filed pursuant to 35 U.S.C. § 121, would free examination resources currently devoted to the rework they impose and increase USPTO resources available for the examination of original applications by about one-third without any increase in staff or funding.

82. See Mark A. Lemley & Kimberly A. Moore, *Ending Abuse of Patent Continuations*, 84 B.U. L. REV. 63 (2004) (cataloguing patent abuses); Debra Koker, Note, *Patent Continuations: A Threat to the System*, 12 B.U. J. SCI. & TECH. L. (forthcoming 2006) (discussing further abuses). Ms. Koker notes that patent continuations serve no useful purpose not otherwise available and permit abuses that diminish public faith and confidence in the integrity of the U.S. patent system. Both papers recommend abolition of all continuing applications except for § 121 divisionals, though the Lemley and Moore paper recognizes the political difficulty of doing so and proposes lesser solutions as well.

83. This change most likely would become unnecessary if exclusive appellate jurisdiction is returned to the regular Circuit Courts of Appeals to the exclusion of the Federal Circuit.

84. The doctrine of equivalents is the patent system's Catch-22. The diligent innovator who has found all of the patents potentially relevant to his or her proposed innovation, and has

- iii). Abolish entirely the nonstatutory secondary considerations as indicators of nonobviousness.⁸⁵
- iv). Publish *all* pending U.S. patent applications eighteen months after their “effective” filing dates, unless the applicant chooses to abandon the application prior to publication and requests that it not be published.
- v). Adopt a “first-inventor-to-file” system, but provide by statute an affirmative “prior-independent-inventor” noninfringement defense that there is no infringement if the accused article or process (or the feature that causes it to be accused) was actually reduced to practice by the alleged infringer prior to the effective filing date of the asserted patent.⁸⁶
- vi). Eliminate “hidden” prior art (e.g., § 102(e)⁸⁷, § 102(g)⁸⁸), but provide an affirmative noninfringement defense, available to all, that there is no infringement if the accused article, process, or service (or the feature that causes it to be accused) is disclosed in or obvious in view of prior art to the asserted patent and any U.S. patent or published U.S. application having an effective filing date prior to the effective filing date of the asserted patent.

4. Undertake legislative reconsideration of the administrative and judicial decisions extending patentable subject matter beyond the “new and useful

carefully designed the innovation so as to avoid all of such patents’ claims (which are supposed to define the invention with particularity) is nonetheless at risk, and can be found to be an infringer even though the innovation is outside all of such patents’ claims. Neither the innovator nor their advisors can know in advance whether the innovation will be found to be an infringement, and they must endure a lawsuit for the answer.

- 85. This change would eliminate some (but not all) of the unnecessary uncertainty that presently pervades our patent system, simplify patent litigation, and reduce costs for innovators and patentees alike.
- 86. The availability of this defense would minimize the need for innovators to file “defensive” patent applications only to assure their right to use their own work, which would reduce the USPTO’s workload and free up the examination resources now devoted to such defensive applications. This “prior-independent-inventor” noninfringement defense should be adopted even if we do not change to a “first-to-file” system! Why should a prior inventor-innovator be deprived of the opportunity to commercialize his or her own prior independent invention free and clear of the claims of a later patent applicant because he or she did not seek a patent and the later applicant did? An alternative “cut-off” date would be the publication date of the application on which the asserted patent was granted.
- 87. Under 35 U.S.C. § 102(e) a U.S. patent is a reference as of its application filing date, not its grant date or the publication date of the application on which it was granted. Thus it is a “hidden” reference for the interval between application filing and patent grant (or application publication).
- 88. Under 35 U.S.C. § 102(g)(2) an inventor is not entitled to a patent if the invention was made in the United States by a prior inventor who had not abandoned, suppressed, or concealed the invention even if the prior invention was not known to the public.

process, machine, manufacture, or composition of matter, or any new and useful improvement thereof” authorized by statute to include intangibles such as business methods, computer software per se, etc.

Notice the Author said nothing about implementing an opposition system, which is a principal recommendation of the FTC and NRC that has been endorsed by the USPTO and the patent attorney lobby groups. For reasons known only to them the FTC and NRC made no recommendations that would resolve the fundamental problem for the U.S. patent system, namely the Federal Circuit and the lowered and less certain standards for patentability promulgated by it, or that would result in restoration of the higher, more certain standards that prevailed prior to the Federal Circuit. Changes that do not address this fundamental problem are simply “Band-Aids” that add additional costs and complexity to an already overly costly, excessively complex system. In the absence of restoration of such higher standards the proposed opposition tribunal will be obliged to apply the current, lower Federal Circuit standards, and will approve, with the blessing of the Federal Circuit, patents that are no more than routine applications of textbook principles of science and engineering. The beneficiaries will again be patent attorneys, patent bureaucrats, and patent examiners who will have more work to do and whose jobs will be made even more secure and remunerative. The proponents all agree that our reexamination system has not worked, but they also have not told us how a USPTO that cannot make our reexamination system work, will muster the management skills to make an even more complicated opposition system work. And besides, if we return appellate jurisdiction in patent infringement cases to the regular Courts of Appeals and restore the higher, more certain standards for patentability that prevailed prior to the Federal Circuit, and the USPTO can be made to apply those higher, more certain standards, then an opposition system might well prove unnecessary.

CONCLUSION

Restoration of appellate jurisdiction in patent infringement cases to the regular Circuit Courts of Appeals should result in the restoration of the higher, more certain standards for patentability that prevailed prior to the advent of the Federal Circuit, and to the establishment of damages rules for patent infringement that do not result in excessive compensation for patentees whose patents are infringed. The return of the traditional federal judicial structure to patent law will return the field to the legal mainstream

and assure that future such decisions are made by judges who are familiar with the full pantheon of legal policies affecting innovation. It will also assure that the Supreme Court is presented with cases that have been fully developed by appeals in two or more of the regular Circuit Courts of Appeals. These changes will result in patent policies that are consistent with other legal policies affecting innovation and will reduce the costs of innovation. Lowered innovation costs and greater clarity in our patent policies are in the interest of business, especially those businesses involved in innovation.