

CHALLENGES FOR INTELLECTUAL PROPERTY LAW IN THE TWENTY- FIRST CENTURY: INDETERMINACY AND OTHER PROBLEMS

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In this article, adapted from his symposium keynote speech, Judge Plager examines the challenges confronting patent law in the new century. Positing predictability and clarity as essential ingredients of an effective system of legal rules, Judge Plager discusses the indeterminacy present in the practice and procedure of today's patent law system. He points first to the patent document itself, written in a language foreign to most judges and a source of misunderstandings in patent-claim interpretation. He then discusses the doctrine of equivalents and the difficulty in effectively applying this doctrine to protect patentees while simultaneously reducing the indeterminacy that results from subjective, insubstantial-difference determinations.

Judge Plager examines the challenges faced by participants in the patent system, including the inventors, the Patent and Trademark Office, the market competitors, the professional advisors and patent lawyers, and finally the judges and courts hearing patent cases. Judge Plager discusses the burden on trial courts due substantially to a lack of expertise in the complex area of patent law. He then describes the role of the Federal Circuit, which has exclusive jurisdiction for appeals from the district courts, weaving in interesting points from his knowledge and personal experiences. Throughout the article, Judge Plager offers insight about possible structural changes that could address the indeterminacy confronting patent law.

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I. INTRODUCTION

In the last quarter of the twentieth century, intellectual property law, in the form of patent law, experienced a major upheaval in doctrine, in judicial process, and perhaps most importantly, in economic role in the marketplace. Patent law provides a system for rewarding entrepreneurship in the marketplace, and entrepreneurs are persons who, broadly speaking, take risks that are otherwise uninsurable—they invest capital in activities the consequences of which are not fully calculable.

If the patent system is to achieve its purpose, the system must not add elements of incalculable risk. That is, the patent system must provide the entrepreneur who relies on it with a substantial amount of predictability regarding patent rights. Otherwise, the positive incentives for marketplace activity inherent in the patent system become diluted by additional unpredictable risk elements in the patent system itself. This is particularly so with regard to the legal rules that govern litigation to enforce patent rights.

The legal rules, whether statutory or judge-made, that govern an area of law presumably function as predictors for the consequences of future conduct. Criminal-law rules warn the citizens of possible penalties if specified societal norms are violated. Civil-law rules define the potential consequences of careless actions, and of actions that breach agreed upon obligations or obligations imposed by law.

That is the negative side of legal rules. On the positive side, legal rules can encourage desired conduct by offering incentives and promising rewards. Patent law contains both negative-consequence rules—liability for infringement of another's patent—and positive incentives—the right, in exchange for disclosing the secrets of the invention, to exclude others from making, using, or selling the invention for the duration of the patent right.

The efficacy of legal rules, either as negative constraints or positive incentives, depends on the clarity of the rules and the confidence with which citizens, and their legal advisors, can predict the consequences of defined conduct. When the consequences of conduct remain to be determined in each case, in light of the particular assessment of individual facts by judges and based on rules of indeterminate scope, predictability is largely missing. Years ago, Karl Llewellyn pointed out that indeterminate outcomes “produce[] appeals based not on sound judgment but on wild speculation, [and] therefore vastly too many appeals”¹ This is the problem of indeterminacy, a problem from which patent law is not immune.

1. KARL N. LLEWELLYN, *THE COMMON LAW TRADITION: DECIDING APPEALS* 43 (1960).

II. THE CHALLENGE OF INDETERMINACY

In patent law, indeterminacy exists both in structure and in doctrine. One source of indeterminacy in patent law resides in the structure of the patent document itself. The heart of the patent document is the specification, which consists of a written description setting out the background and describing the purpose and uses of the invention, followed by a set of claims. The claims tell us the scope of the patented invention, and it is the claims that the courts enforce as the patent right.

Naturally, the inventor wants to have the claims stated as broadly as possible to cover not only the actual invention but also all possible future variants. Thus, lawyers who draft patent specifications for their clients tend to write claims in the broadest and most general terms possible, sometimes to the point at which it is virtually impossible to grasp what is actually claimed. It does not help that the traditional rule, incorporated in Patent and Trademark Office (PTO) guidance, is that each claim must be drafted without internal terminal punctuation—that is, in one sentence—even if the sentence runs on for many lines and contains multiple ideas and phrases.² The writing of English this is not.

The first challenge then is to achieve a better understanding of what the words of the patent document mean—what is the claimed invention. Several years ago, in the *Markman* decision, the United States Court of Appeals for the Federal Circuit, for reasons to be noted later, took that responsibility away from juries and gave it exclusively to judges.³ Under *Markman*, therefore, the trial judges bear the initial responsibility for claim interpretation.⁴ Recognizing that in many cases claim interpretation is not an easy task, we told the trial judges that they could consult experts, read books, and do whatever it takes to understand the technology on the way to construing disputed terms in the claims.⁵

The way the language of the claims is construed is often outcome-determinative in a patent-infringement suit. Though there are exceptions, the structure of the accused device usually is not hard to determine; the question always is whether the claims read on, i.e., cover, that structure. So reading claims is an art of sorts, involving half technology and half linguistics. To many trial judges it is a foreign art; understandably, they are not batting 1.000 (more like .500).

The idea behind taking claim construction away from juries and giving it to the judges was to produce more consistent and predictable results, as well as to allow for more responsible review on appeal. Today,

2. See U.S. DEP'T OF COMMERCE, PATENT AND TRADEMARK OFFICE, MANUAL OF PATENT EXAMINING PROCEDURE 608.01(m) (7th ed. 1998 & Supp. I 2000).

3. See *Markman v. Westview Instruments, Inc.*, 52 F.3d 967 (Fed. Cir. 1995), *aff'd*, 517 U.S. 370 (1996).

4. See *id.*

5. See *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1308–09 (Fed. Cir. 1999); *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 1454 (Fed. Cir. 1998) (en banc).

trial-court judgments in infringement suits often come to us as summary judgments, with a trial judge's best shot at claim construction and the parties' agreement to appeal the decision rather than go through a lengthy trial process and then get told years later by us that the claim construction was wrong. Thus, on appeal, the court now has a written opinion from the trial judge that reveals what the court's construction of the claim was, rather than a general jury verdict that does not.

This, of course, cuts both ways. When on appeal we had only the black-box jury verdict, all we could do was guess about what the jury might have thought the claim meant. If the outcome was supportable under any reasonable interpretation of the claim, we could affirm the verdict and judgment. Now, we receive the explicit interpretation of the claim by the trial judge following a *Markman* hearing, and we must decide whether that reading of the claim is the one correct reading. If it is not the correct reading as we see it, the judgment ordinarily cannot be upheld.

The challenge here is how to help trial judges, as well as ourselves, understand what is being claimed so that there is less room for misunderstanding. The answer lies in the way claims are drafted. There can be little doubt that a considerable improvement would be to have more understandable, more coherent claim drafting so that the judges who are the ultimate enforcers of these bits of private legislation can do their job with some confidence that they, or anyone else who tries, will get it right. Because claims in U.S. patents are written using words and phrases that purport to be in the English language, it might help if the rest of English language practice was used: short declarative sentences, careful and precise phrasing, and so on.

Perhaps patent law could take note of the revolution that has occurred in other areas of public law with regard to the drafting of legal documents. An example is the way in which the insurance industry now writes house and life insurance policies. Several years back, the industry changed from historically obscure documents written in legalese to documents written in working English, understandable by a reasonably educated person, apparently without any loss of legal effect. Good will drafting today reflects the same notion. There may be real limits to how far this can be done in patent claiming, given the technical nature of inventions. There are, however, no insurmountable doctrinal or statutory barriers to reducing this area of patent law's indeterminacy; it is mostly a matter of recognizing what needs be done, and the patent bar doing it.

On the doctrinal side of indeterminacy, the most obvious and well-known example in patent law is the doctrine of equivalents. This judicially thought-up doctrine extends the reach of the patent claim beyond its literal application, to cover equivalents that are thought to be insub-

stantially different from the specific limitations in the claim.⁶ The original idea was to prevent an unscrupulous competitor from essentially stealing the invention by designing a meaningless difference into a new product, in the hopes of evading the scope of the patent.⁷

Of course, what are thought to be insubstantial differences depends on who is doing the thinking. And because infringement under the doctrine is a question of fact, the first thinker may be a jury from which, in a general verdict, the answer may be a simple yes or no: the jury concludes that some element of the accused product is or is not insubstantially different from a limitation in the claim.

This level of indeterminacy under the doctrine of equivalents is compounded by the rule that says a patentee cannot claim for purposes of infringement under the doctrine what was given up during prosecution of the patent before the PTO. For example, suppose the applicant's draft claim sought a range for the inventive device of 50 to 90 units, and the PTO examiner rejected the claim on the grounds that prior art disclosed a range of 85 and above. The applicant amends the claim to recite a range of 50 to 75, and the patent issues with the claim so reading. What did the patentee give up? Does a competitor's device that operates at 80 infringe? Clearly not literally, but under the doctrine of equivalents?

One answer is, it depends; is 80 an insubstantial difference from a range that goes to 75? Another answer is, no, absolutely no; you gave up everything above 75 when you amended your claim in order to obtain your patent. Until our recent decision in *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*,⁸ the standard answer was the first, "it depends." In *Festo*, as in *Markman*, the court set out to reduce an area of indeterminacy. The answer now is the second: if for "any reason related to the statutory requirements for a patent" you narrow the scope of your claim by an amendment, you give up access to the doctrine of equivalents with regard to that claim limitation.⁹ In our hypothetical case, the patent applicant amended the claim to avoid prior art, clearly a reason related to a statutory requirement for patentability. The competitor who operates at 80 is safe from a charge of infringement under the doctrine of equivalents with regard to the claim limitation of 50 to 75.

Regrettably, *Festo* does not solve all the problems of indeterminacy in the doctrine of equivalents. There is the lingering problem of what constitutes "any reason related to the statutory requirements for a patent," i.e., exactly which statutory requirements give rise to prosecution history estoppel, and, inevitably, how related is the reason.¹⁰ More fun-

6. See *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 24 (1997).

7. See *Graver Tank & Mfg. Co. v. Linde Air Prods. Co.*, 339 U.S. 605, 608-09 (1950).

8. 234 F.3d 558 (Fed. Cir. 2000).

9. *Id.* at 563.

10. The Supreme Court's phrase in *Warner-Jenkinson* is, "a substantial reason related to patentability." 520 U.S. at 33. Does that have the same meaning as "a reason substantially related to pat-

damentally, the indeterminacy inherent in the doctrine remains, because it leaves unchanged the indeterminacy of “insubstantial differences” in cases in which the limitation at issue has not been amended. Thus, it creates a disincentive for the present system of negotiation between applicant and PTO examiner in arriving at agreed upon claim language, with probably some as of yet unforeseen consequences.¹¹

The challenge remains: how to effectively cabin the use of the doctrine of equivalents, now raised in practically every infringement suit, so as to reduce the degree of indeterminacy throughout the system, while still protecting patentees from fakery by those who prefer to steal another’s invention rather than invest in their own research and development. Should the rules be different for inventions that require lengthy and expensive periods of gestation, as distinct from the rapidly evolving software/business method patents that now are clogging the system? Do mechanical arts call for a different approach than less tangible areas of technology, such as biotechnology and software inventions?

Are the solutions to the problems posed by the doctrine of equivalents the responsibility of courts, primarily the Federal Circuit? The Supreme Court in *Warner-Jenkinson* suggested that the Federal Circuit had a special role to play.¹² And, it is true that the doctrine is court-made.¹³ But it may also be true that the doctrine has taken on a life of its own, and is now so ingrained in patent law and in expectations by patentees that only forward-looking legislation, as distinct from retrospective judicial decree, can solve the problem.

III. OTHER AREAS OF CHALLENGE

These are but two examples of the sources of indeterminacy in patent law. Those familiar with this body of law will have little trouble pointing to others, and wondering why their favorites have not been mentioned. Rather than belabor the point, I want to note other facets of patent law that present challenges for the future. Some of these also contribute to indeterminacy because they are interrelated structural or doctrinal problems.

One problem that cannot go unmentioned is the cost and delay in patent-enforcement litigation. Of course, patent litigation is not alone in this respect—the first case I sat on in 1990, shortly after I joined the court, was a government-personnel case that had had its first hearing ten

entability”? If not, how does one test for a “substantial” reason? Note that the Federal Circuit’s translation is, “any reason related to the statutory requirements.” *Festo*, 234 F.3d at 563.

11. See *id.* at 591–95.

12. See *Warner-Jenkinson*, 520 U.S. at 39.

13. See *Graver Tank*, 339 U.S. at 608; see also John F. Sweeney & James F. Bush, *The Doctrines of Equivalents and Prosecution History Estoppel: What Has Warner-Jenkinson Changed?*, in PLI’s FIFTH ANNUAL INSTITUTE FOR INTELLECTUAL PROPERTY LAW 1999, at 135, 138–40 (PLI Patents, Copyrights, Trademarks & Literary Prop. Course, Handbook Series No. 573, 1999).

years earlier! For major patent cases today, a rough estimate is that five years is the average length of time from first complaint to final judgment on appeal, allowing about one-and-a-half years from the time a case is decided in a district court, then appealed, briefed, heard, and a final decision is rendered by our court. The frequently repeated dollar figure for the exercise is one to one-and-a-half million dollars.

During the past several years we have returned to the trial courts, either through vacating or reversing their judgments, a substantial percentage of patent cases that reach us on appeal. This is not because we think trial judges are eager to get a second crack at these cases, or that as an appeals court we enjoy the prospect of seeing the same case come back again. On the contrary, we make a conscious effort to find a way to end litigation if we can, within the law. A significant cause of this reversal rate is the indeterminacy of current day patent law.

I will return to the challenges facing the courts, but it is important to recognize that in today's patent system, courts are not the only ones being challenged. We also need to consider the challenges faced by the inventor in developing a patentable invention; the challenges faced by the PTO in examining and determining under the law whether the inventor has a patentable invention; and the challenges the market competitor has in taking advantage of the disclosures made in the patent, an advantage the law specifically grants, without running afoul of the rules designed to prevent stealing of another's invention. Running through all of this are the challenges confronted by the professional advisors and patent lawyers in drafting the claims, shepherding them through the PTO, and then asserting them, or defending against them, in office practice and ultimately in litigation.

The patent that the judge has to wrestle with is a product of the examination process of the PTO, an agency within the Commerce Department. This is an agency with a challenge. The PTO receives some 300,000 applications for patent each year. It reviews these applications using an examining corps of 3100 people, and they currently issue something like 170,000 new patents yearly. That comes out to about twenty hours per application being examined, assuming the examiner does little else during the course of a normal work week. More likely the available hours are half that number.

When an issued patent comes before our court, after having been vetted initially by the PTO and with the full record developed at the district court, it is not uncommon for a judge's law clerk to spend some number of days reviewing the briefs and the often multivolume record and preparing a bench memo for the judge. The judge will also spend substantial time preparing for argument of the case: reading the opinion of the trial court, the 125 pages of briefs from the parties, and dipping into the record, key statutes, and prior court decisions flagged by the clerk in the bench memo. There are, of course, limits to how much time

a judge may spend—though each law clerk typically is responsible for one-third of the cases assigned to a chambers, the judge is responsible for all cases, and that patent case may be only one of six or seven cases to be decided in a sitting day. Even so, multiplying the effort that goes into reviewing the patent case by each of the three chambers represented on the panel, we may have something like 100 hours of chambers work addressed to the same patent that the PTO was only able to give one-tenth the time.

It is not news to those in the field that the PTO is drowning in work. The agency's response appears to be to increase its output, i.e., issue more patents, presumably in even less time. Thus, in recent times, we have the one-click patent issued to Jeff Bezos and others at Amazon.com¹⁴ that attempts, as do many other Internet patents, to cover a common activity and has caused an uproar in the technology community; and a patent to David Strom, of Aurora, Colorado, for a method to transmit electromagnetic waves that send a signal "at a speed faster than light."¹⁵ There is also a new patent for a method for measuring a woman's breasts with a tape measure to determine her bra size.¹⁶ Just what effect Congress's recent designation of the PTO as a Performance Based Organization,¹⁷ only the second agency to be so designated, will have on all this remains to be seen.

The PTO, of course, responds to what is brought to it by the intellectual property bar. For a long time patent law was the province of a small number of practitioners in boutique firms, working in an area of law that was foreign, if not largely unknown, to the bar and the economy generally. Today, that picture has changed dramatically. Intellectual property, particularly patent rights, is now a substantial part of the asset portfolios of many business enterprises. The law firms that specialize in intellectual property can match in size some of the big general-practice firms. At the same time, the big general-practice firms have established their own patent-law departments, created by absorbing smaller boutique firms or by building with the new technically trained, patent-oriented lawyers who are being turned out by law schools all over the country.

A recent piece in the journal *Science* contained a graph comparing the growth in the number of lawyers claiming membership in the ABA's intellectual property law section with the growth in research expenditures.¹⁸ Between 1986 and 1996, the trend line was almost vertical, demonstrating that the growth in the number of lawyers needed to handle the legal aspects of technology—and hence the money spent on such ser-

14. See U.S. Patent No. 5,960,411 (issued Sept. 28, 1999).

15. U.S. Patent No. 6,025,810 (issued Feb. 15, 2000).

16. See U.S. Patent No. 5,965,809 (issued Oct. 12, 1999).

17. See Patent and Trademark Office Efficiency Act, Pub. L. No. 106-113, § 4712, 113 Stat. 1501A-573 (1999).

18. See John H. Barton, *Reforming the Patent System*, 287 SCIENCE 1933 (2000).

vices—far outstripped the growth in spending to develop that technology.¹⁹ The bar has heeded Deep Throat’s admonition, “follow the money.”

IV. THE CHALLENGE FOR THE JUDICIARY

As noted, these challenges are in addition to the challenges faced by the 600-plus district judges throughout the country, the now-eleven active and four senior judges of the Federal Circuit, and, more’s the pity, occasionally the nine Justices of the Supreme Court. Here, challenges include trying to figure out what the invention is, whether the PTO properly granted (or, more rarely, denied) the patent, whether the lawyer’s drafting meets the minimum requirements for disclosure and constitutes claim drafting without claiming beyond the invention’s legitimate reach, whether the competitor walked that fine line between improvement and fakery, and whether the litigators led the trial court down the path to error, or whether the trial court escaped the pleas of the rightful loser.

It is my sense that, generally speaking, the trial judges are in the most difficult situation when it comes to patent law. Most of them are not technically trained and even fewer have patent-law backgrounds. Nor are they likely to choose law clerks on the basis of the applicants’ skills in those areas.

With the help of a law clerk, I took a rough cut of the last five years of patent litigation in the district courts, as best the cases could be identified using the Westlaw database. In that five-year period, we found a total of about 1250 published district court cases, heard by some 375 different district judges. Simple math suggests that, on average, each trial judge heard three plus cases over the five year period, which is less than one patent case a year. The distribution among the individual judges, however, is even more revealing. The data indicate that the majority of the judges heard two or fewer patent cases in the entire five years. On the other hand, three district judges, Judges Robinson and McKelvie in the District of Delaware and Judge Ellis in the Eastern District of Virginia, each handled more than five times that number. (As patent lawyers know, if they attend a conference on patent litigation, they will almost invariably hear from one or another of those three judges and only occasionally from any other trial judge.)

This is not to suggest that other district judges are necessarily less competent in handling patent cases. Chief Judge Avern Cohn of the Eastern District of Michigan and Chief Judge William Young of the District of Massachusetts, for example, come readily to mind as judges with a particular bent for patent cases, and who seem to actually enjoy trying them. It is to suggest, however, that for the many district judges over-

19. *See id.*

burdened with drug cases and a docket of civil cases from ever-new federal laws, who have little if any background in the body of complex legal rules that constitutes patent law, and who get one major patent case in a three-to-five year period, the prospect of taking on a complex patent case must be daunting. Conversations with district judges around the country confirm this to be so.

Contrast that with the experience we judges have on the Federal Circuit, the exclusive venue for appeals from these trial judges. In that same five-year period the court heard appeals in about 800 patent cases. We sit in panels of three; by rounding the full court to twelve judges, and thus taking into account the contribution of our senior judges, each judge hears about a fourth of the court's caseload.²⁰ Assuming a relatively even distribution over a five-year period—the panels are formed and the cases are allocated by a computer program designed to ensure equal exposure—each panel judge thus heard about 200 patent cases, or about forty cases a year. Because each judge typically sits four of the first five days of each month, ten months a year, this means our appellate judges will hear and decide a patent case just about every day they sit.

Even after ten years on the court and hearing that number of patent cases a year, I would be the last to describe myself as an expert in patent law. Reasonably knowledgeable perhaps, but hardly an expert. It is humbling to imagine what it must be like to be a district judge, hearing her one or two patent cases in five years, in which she is expected not only to manage a trial in which the technology is often cutting-edge and the experts do not agree on anything, but also to understand and correctly apply the intricacies of patent law, including such wonders as the reverse doctrine of equivalents.

In this context, and considering the stresses on the system, the challenge is to ensure that a system of rights, in which the upheavals I described earlier are occurring, nevertheless provides a high degree of stability and does not introduce yet more unknowns into the risk equation. In my view, the system of rights we presently administer falls short of this goal. Instead of providing a straightforward, easily understandable system for preserving a risk-taker's reward, we have today a system of patent-law rights that in some respects, at least, can only be called confusing and, in important parts, arcane.

V. THE CHALLENGE OF HISTORY AND A CHANGING LEGAL LANDSCAPE

There is a history here. During the era of the small boutique firms, patent law developed its own language and rules, known only to the patent cognoscenti. The few law schools that offered the subject were in

20. During the period in question, the court operated a substantial part of the time with only eleven active judges, including three or four senior judges.

metropolitan areas where they could find a patent practitioner interested in offering a course to a self-selected few. As a long-time property lawyer, but a newcomer to patent law when I joined the court, I was surprised to discover how much of patent law was outside the mainstream of commercial and public law generally. For example, I found that the equitable doctrines of laches and estoppel had meanings in patent law unlike anything found elsewhere in equity jurisprudence; venue for patent cases was determined under a unique interpretation of the general venue statute; and the court's standard for reviewing decisions of the patent-issuing agency was independent of federal law governing agencies, as found in the Administrative Procedure Act (APA).²¹ And this was in addition to the non-cognoscenti having to sort through the substantive content of patent rules resident in statute and court decisions.

How well has this body of inherited legal doctrine kept pace with the changing legal landscape? The Federal Circuit has made a point of moving patent law back into the mainstream of law when there was opportunity to do so, and when we could agree it was needed. So we have redefined laches and estoppel,²² and brought ourselves back under the same venue rules that apply to other civil cases.²³ When we dragged our feet, as was the case in straightening out our role under the APA,²⁴ we got help from the Supreme Court.²⁵ When we insisted on applying an "all the facts and circumstances" standard to cases,²⁶ the ultimate in indeterminate rules, the Supreme Court imposed a rule that leads to more predictable results.²⁷

Legislation in response to the GATT/TRIPS Treaty²⁸ brought about some significant changes in patent law, including the change in patent term from seventeen years from the date of issuance to twenty years from the date of application, to bring us into closer conformity with the rest of the world.²⁹ In the American Inventors' Protection Act of 1999,³⁰ Congress made other significant changes in parts of the Patent Act. Even so, the basic structure of the Patent Act remains essentially as it was adopted almost fifty years ago.³¹

The advent of the Court of Appeals for the Federal Circuit in 1982 ended the era of dueling courts of appeals, some avowedly propatent and

21. See 5 U.S.C. § 706 (1994).

22. See *A.C. Aukerman Co. v. R.L. Chaides Constr. Co.*, 960 F.2d 1020, 1046 (Fed. Cir. 1992) (en banc) (Plager, J., concurring in part, dissenting in part).

23. See *VE Holding Corp. v. Johnson Gas Appliance Co.*, 917 F.2d 1574, 1583 (Fed. Cir. 1990).

24. See *In re Zurko*, 142 F.3d 1447, 1449, 1459 (Fed. Cir. 1998) (en banc).

25. See *Dickinson v. Zurko*, 527 U.S. 150 (1999).

26. See *Pfaff v. Wells Elecs.*, 124 F.3d 1429, 1433 (Fed. Cir. 1997).

27. See *Pfaff v. Wells Elecs.*, 525 U.S. 55, 67–68 (1998).

28. See General Agreement on Tariffs and Trade—Multilateral Trade Negotiations (The Uruguay Round): Agreement on Trade-Related Aspects of Intellectual Property Rights, Including Trade in Counterfeit Goods, Dec. 15, 1993, 33 I.L.M. 81 (1994).

29. See Uruguay Round Agreements Act, Pub. L. No. 103-465, 108 Stat. 4809 (1994).

30. Pub. L. No. 106-113, §§ 4001–4808, 113 Stat. 1501A-552 to 1501A-591 (1999).

31. See Patent Act of 1952, Pub. L. No. 82-593, 66 Stat. 792 (1952).

some equally antipatent, and the forum-shopping that these duels engendered. We now have one court of appeals with exclusive jurisdiction over the patent system. (The court's jurisdiction is not limited to patents; Congress at the time of the court's creation and since has included in the exclusive jurisdiction of the Federal Circuit cases from the United States Court of Federal Claims, the Merit Systems Protection Board, Government Boards of Contract Appeals, the Court of Appeals for Veterans Claims, the Court of International Trade, and various government agencies, including those involving members of Congress itself, among others.) Initially thought of as an experiment because of its subject-matter-based rather than geography-based jurisdiction, the Federal Circuit is now an established part of the federal judicial structure.³² Professor Dreyfuss, of New York University, has detailed the positive gains that the court has been able to bring to the patent system.³³ Her study is an excellent example of the contribution that empirical studies can make to the understanding of law and legal institutions.

VI. CONCLUSION: ADDRESSING THE CHALLENGES

Efforts to solve structural problems in the law must be carefully crafted; they may not always bring about only the results intended. The doctrine of unintended consequences lurks in every corner. For example, I noted that in *Markman*³⁴ we set out to correct a serious deficiency in the way we try infringement cases. Pre-*Markman*, though claim construction was understood to be a critical piece of the decision in these cases, the parties and the trial judges were generally content to give that piece to the jury along with the rest of the case. Jury determinations on claim construction were often black-box decisions, impenetrable by the ordinary rules of law.

Markman, then, was intended to deal with that structural problem by reassigning the claim-construction question entirely to judges, to be decided transparently, much as statutory-interpretation issues are decided.³⁵ What was unintended was the emergence of a whole new genre of trial process, known as "the *Markman* hearing," and all that has engendered. Not the least of the unintended consequences, although not entirely unforeseen, was the heavy additional burden placed on the nation's trial judges in these patent cases, a burden they are, on the whole, ill-equipped to assume.

32. See generally S. Jay Plager, *The United States Court of Appeals, the Federal Circuit, and the Non-Regional Subject Matter Concept: Reflections on the Search for a Model*, 39 AM. U. L. REV. 853 (1990) (considering the possibilities of a nonregional subject matter design by examining the Federal Circuit).

33. See Rochelle Cooper Dreyfuss, *The Federal Circuit: A Case Study in Specialized Courts*, 64 N.Y.U. L. REV. 1, 74 (1989).

34. See *Markman v. Westview Instruments, Inc.*, 52 F.3d 967 (Fed. Cir. 1995), *aff'd*, 517 U.S. 370 (1996).

35. See *id.*

One alternative to the burden on the district judges that has been suggested from time to time is the establishment of a specialized Article I court whose primary if not sole job would be the trial of patent cases. I have written at length about why it is a mistake to think of the Federal Circuit as a specialized court, and the importance of retaining a broad general base in courts of appeals.³⁶ Those same considerations may not apply at the trial level. Yet moving infringement suits from the generalist district courts to a trial bench that by purpose would be made up of specialists in patent law would have far-reaching implications for the system.

With regard to the indeterminacy of the doctrine of equivalents, an argument has been made that the way to solve the problem is to do away with it altogether; others have argued that we could achieve considerable improvement in our analytical approach by expressly acknowledging the doctrine's equitable roots and focusing on the inherent equitable considerations.³⁷

These are just some examples of structural changes that may address challenges confronting patent law in the coming century. They carry with them obvious gains and less obvious consequences, some of which may be unintended. The reality that we cannot always foresee all the consequences that change may bring does not argue against correcting perceived deficiencies in the law. However, it does argue for seeking solutions that achieve the goal sought with the least cost to other parts of the system.

Major correctives, such as *Markman*,³⁸ and *Festo*,³⁹ must be assessed with that principle in mind and with a willingness to reassess when the evidence challenges the efficacy of the solution. But having said that, if patent law is to play its appointed role in the new century, I suggest that courts and legislatures must not shirk from making the structural changes needed to bring about a simpler and more predictable system. The goal must be, and the challenge is, to have a system of rights that produces outcomes that are as predictable as possible. That, after all, is the essential meaning of the Rule of Law.

36. See Plager, *supra* note 32, at 864.

37. See *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 234 F.3d 558, 591–95 (Fed. Cir. 2000) (Plager, J., concurring); *Hilton Davis Chem. Co. v. Warner-Jenkinson Co.*, 62 F.3d 1512, 1540 (Fed. Cir. 1995) (Plager, J., dissenting, joined by Judges Archer, Lourie, and Rich).

38. See *Markman*, 52 F.3d at 967.

39. See *Festo*, 234 F.3d 591–95 (Plager, J., concurring).

