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# The Supreme Court and the Federal Circuit: A Case of Supervision by Generalists

Jay Dratler Jr.

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## THE SUPREME COURT AND THE FEDERAL CIRCUIT: A CASE OF SUPERVISION BY GENERALISTS

*Jay Dratler, Jr.\**

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The United States Court of Appeals for the Federal Circuit has been in business for twenty-eight years now. Although its purview includes things besides patent law, its *raison d’être* was unmistakable. It was supposed to rationalize the judge-made part of patent law by taking exclusive jurisdiction of appeals in patent cases. Congress and the patent bar hoped that it would eliminate stark differences in approaches and outcomes among the eleven regional federal circuits and thereby discourage forum shopping in patent cases, which had become rampant.<sup>1</sup>

Although that was the principal motivation for its formation, there were others less readily confessed. Few federal judges sought patent cases, for few of them had sufficient acquaintance with patent law or with the many fields of science and technology that underlie it. Therefore, they felt uncomfortable and sometimes incompetent to rule on patent matters. Having a single court with judges chosen and assigned to decide patent cases seemed like something that might make the judiciary happier.

There were, of course, dissenters. Some scholars and judges argued that good judging demands generalists, not narrow specialists who might perpetuate error in their exclusive corner. Specialists might also fail to weave the narrow fabric of patent law into the seamless web that is the

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1. See S. REP. NO. 97-275, at 5, 7, 18-20 (1981), *reprinted in* 1982 U.S.C.C.A.N. 11, 15, 17, 28-30.

law as a whole. These arguments held some abstract attraction, but they fell under the weight of statistics showing rampant forum shopping and complaints about procedural shenanigans having little to do with innovation and much to do with strategic advantage in litigation. And so on October 1, 1982, the Federal Circuit was born.<sup>2</sup>

The Federal Circuit did achieve its stated goal of curtailing forum-shopping in patent cases. It could hardly fail to, for Congress granted it exclusive jurisdiction over patent appeals from all the federal district courts, as well as the PTO.<sup>3</sup> There was a small delay while the court figured out how to prevent the parties from manipulating appellate jurisdiction,<sup>4</sup> but once it solved that problem, litigants found it hard to circumvent appealing to the single, specialized court.

The court had less success, however, in solving what I call “Thomas Jefferson’s problem.” As we shall see, Jefferson was one of only two Founders with a serious interest in science and technology. He had invented several important improvements to plows. So it was natural for him, in his capacity as Secretary of State, to found our first patent board and draft our first patent statute.<sup>5</sup>

Jefferson abhorred monopolies. He wanted to include a prohibition against them in our Bill of Rights. James Madison had to convince him that *temporary* monopolies for patents and copyright would encourage creativity and innovation.

So Jefferson understood that not everything new ought to be patented. He made a stab at drawing the line by coining the phrase “*sufficiently useful and important*” to impose a greater-than-novelty requirement for patenting.<sup>6</sup> He hoped that, with time and practice, his patent board would develop more specific rules for determining what novelties deserve patent protection and what do not, and how broadly a patent controls future commerce and innovation.

2. Federal Courts Improvement Act of 1982, Pub. L. No. 97-164, § 402, 96 Stat. 57 (providing that Federal Circuit has exclusive jurisdiction over appeals filed after that date).

3. 28 U.S.C. § 1295(a)(1), (4)(A), (4)(C) (2000).

4. The Supreme Court established the “well pleaded complaint” rule for determining the court’s appellate jurisdiction six years later. *See Christianson v. Colt Industries Operating Corp.*, 486 U.S. 800, 809 (1988). *See also Holmes Group v. Comado Air Circulation Systems*, 535 U.S. 826, 827, 834 (2002) (stating no jurisdiction where only counterclaim, not complaint, raises issue of patent law).

5. *See Graham v. John Deere Co.*, 383 U.S. 1, 6-10 (1966) (summarizing Jefferson’s work as organizer of our patent system, author of first patent law, ex officio member of first patent board, and notable inventor).

6. *Id.* at 7 (quoting Patent Act of 1790, 1 Stat. 110) (emphasis added).

But Jefferson had “higher duties” as Secretary of State and later President. So after a few years, he left it to others and to the judiciary to complete the “slow progress [with which] a system of general rules could be matured.”<sup>7</sup> That task, of course, still occupies us over two centuries later.

As momentum for the Federal Circuit was building, there was some hope that it might help. This hope was hardly a major—let alone *the* major—reason for its founding. But like Jefferson, some scholars and judges hope that application of willing, not coerced, judicial intelligence to Jefferson’s problem might eventually produce results.

Unfortunately, things have not quite worked out that way. Many of the “general rules” that the Federal Circuit developed in its effort to simplify patent law turned out to be too crabbed and formalistic to do the job that Jefferson intended. As a result, the Supreme Court has had to step in. In virtually every case where it has done so, the High Court has rejected a narrow, formulaic rule proposed by the Federal Circuit and opted for something more general and flexible.

This paper analyzes some key cases of that sort. In the process, it attempts to answer the question “why”? Why did a specialized court fail to solve Jefferson’s problem? Are the “general rules” that Jefferson sought an illusion, or can we find them, and, if so, how?

## I. THE PROBLEM OF EQUIVALENTS

We begin not with what is patentable, but how far a patent extends. A patented invention is not like a book or diagram, which contains its own description. To be sure, a skilled technologist might be able to examine an invention, determine what it does, and see how it works. But even the most highly skilled person cannot determine what is *new* about an invention—let alone what makes it worthy of a patent—without some knowledge external to the invention itself.

To solve this problem, patent law soon fixed on the expedient of “claims.” These are simply a series of highly formalized verbal assertions of what about the invention makes it new and patentable.<sup>8</sup>

At first, the law relied on so-called “central” claims, which tried to describe the “essence” or “center” of the invention that made it new and

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7. *Id.* at 10 (quoting Letter from Thomas Jefferson to Isaac McPherson (Aug. 1813), reprinted in VI WRITINGS OF THOMAS JEFFERSON 180-181 (Washington ed., 1853-54)).

8. See 1 JAY DRATLER, JR. & STEPHEN M. MCJOHN, INTELLECTUAL PROPERTY LAW: COMMERCIAL, CREATIVE, AND INDUSTRIAL PROPERTY § 2A.03[1] (L.J. Press 1991 & Supps.) [hereinafter DRATLER & MCJOHN, IP] (discussing patent claims and their construction in depth).

patentable. But over time, during the nineteenth century, the law found central claiming inadequate and turned to “peripheral” claiming. The idea of “peripheral” claims—which today we just call “claims”—was to describe verbally every element of the invention that is new and patentable with respect to “prior art.”<sup>9</sup>

Today, claims are the essence of every utility patent. They appear at the end of the patent document, after the narrative “specification” has described the invention, how it works and what it does generally. They have been likened to the “metes and bounds” in a description of real property, for they define the invention and the patentee’s legal rights in it.<sup>10</sup>

Claims have both a benefit and a burden. They benefit the patentee and the public by specifying precisely where the patentee’s temporary legal monopoly ends. But they also burden the patentee by committing her to a form of words that may or may not accurately cover the essence of her invention, i.e., her contribution to technology. A clever usurper may find a way to steal what the patentee really discovered without infringing on what the literal language of the claims describes.

Beginning in 1854, the law learned how to prevent injustice of this sort.<sup>11</sup> The means was a thing that came to be called the “doctrine of equivalents.” If a defendant uses something that is “equivalent” to what the patents claims describe, then he infringes, even though the literal language of the claims does not “read on” his device.<sup>12</sup>

It takes only a moment’s thought to understand three consequences of the doctrine of equivalents. First, they undermine the very purpose of having claims in the first place. There is no getting around this fact—which sparked sharp dissents in two seminal cases on point.<sup>13</sup> If you “fuzzy up” the precise meaning of the claims to prevent injustice, you dilute the certainty and public notice that claims are supposed to

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9. *Hilton Davis Chemical Co. v. Warner-Jenkinson Co.*, 62 F.3d 1512, 1566 & n.18 (Fed. Cir. 1995), *aff’d*, 520 U.S. 17, 29 (1997) (describing the transition from central to peripheral claiming).

10. *Corning Glass Works v. Sumitomo Electric U.S.A., Inc.*, 868 F.2d 1251, 1257 (Fed. Cir. 1989) (stating “A claim in a patent provides the metes and bounds of the right which the patent confers on the patentee to exclude others from making, using, or selling the protected invention”).

11. *Winans v. Denmead*, 56 U.S. 330, 343-44 (1854).

12. *DRATLER & MCJOHN, IP*, *supra* note 8, § 2A.03[2] (discussing doctrine of equivalents in depth).

13. *See Graver Tank & Manufacturing Co. v. Linde Air Products Co.*, 339 U.S. 605, 617 (1950) (Black, J. and Douglas, J., dissenting); *Winans*, 56 U.S. at 347 (Campbell, J., joined by three justices, dissenting).

provide. The goals of clarity, certainty, and economy are always in tension with the elusive goal of substantive justice.

Second, once you expand the scope of claims beyond their literal meaning, semantics can no longer be your guide. There must be some principle, external to the language of the claims themselves, that determines how far their coverage can be stretched. Finally, the whole matter is a well-known feature of American law generally: a penchant for doing justice regardless of the uncertainty and litigation expense that doing justice in every case may create. Transaction costs be damned; we want justice!

But what external principles can we invent for this purpose? Are they semantic? Meta-semantic? Or must they inevitably be scientific and technological?

My favorite case is *Coning Glass Works v. Sumitomo Electric USA, Inc.*,<sup>14</sup> which I have also discussed in an earlier article.<sup>15</sup> The patentee had been trying to find a way to reduce power loss in light beams traveling through optical fiber.<sup>16</sup> He recalled a principle of basic physics, under which a light ray hitting a material interface, at an oblique angle, from a medium with higher index of refraction to one with lower, is totally reflected internally.<sup>17</sup> This principle is responsible for the mirror-like effect that you see when looking upward at the surface of the water from inside a swimming pool. Like water as compared to air, the “inside” medium must have a higher index of refraction than the “outside” one to achieve the reflection effect.

The patentee applied this principle to optical fiber by “doping” an inner cylindrical core with impurities to give it a higher index of refraction than the pure cladding.<sup>18</sup> His claims described that technique, and only that technique.<sup>19</sup> The defendant used the same principle, without literally infringing the claims, by doping the *cladding* to *lower* its index of refraction compared to the cylindrical core.<sup>20</sup> The court had no trouble finding infringement under the doctrine of equivalents, for the defendant had copied the patentee’s discovery, if not his precise means.<sup>21</sup>

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14. *Sumitomo*, 868 F.2d at 1257–62.

15. See Jay Dratler, Jr., *Fixing Our Broken Patent System*, 14 MARQ. INTELL. PROP. L. REV. 47, 82 n.84 (2010) [hereinafter Dratler, *Fixing*].

16. *Id.*

17. *Id.*

18. *Sumitomo*, 868 F.2d at 1254.

19. *Id.* at 1255.

20. *Id.* at 1255–57.

21. *Id.* at 1260–61.

This case goes a long way to answering our question about external principles. There is no semantics or meta-semantics that could have reliably and honestly reached that result. You have to know some physics. Only when you have taken a college physics course and understand the principle of total internal reflection and how it works does the result make any sense at all. Without that principle, the law would look as if it were actualizing Jonathan Swift's parody, claiming that black is white.

This brings us to what, in my view, is the most revealing case in which the Supreme Court brought the Federal Circuit to heel, *Festo*.<sup>22</sup> Sensing Tom Jefferson's mandate to simplify and regularize patent law, make its outcomes more certain, and reduce its extraordinary expense, the Federal Circuit sought ways to limit the doctrine of equivalents. Eventually, it settled on two. First, the doctrine would not apply to inventions as a whole, or even to whole claims. It would apply only to claim *elements*, i.e., separate and distinct semantic portions of claims having corresponding identifiable aspects of physical components or process steps.<sup>23</sup> Second, the doctrine would not apply to any claim element that had been amended in the course of patent prosecution, for whatever reason.<sup>24</sup> This latter rule was called a "complete bar" to the doctrine by virtue of a claim-element amendment.<sup>25</sup>

There is a lot of historical background and nuance to the *Festo* decision and its predecessors. Suffice it here to say that the Supreme Court accepted the first limitation<sup>26</sup> but not the second.<sup>27</sup> Equivalents now apply only on an element-by-element basis, but courts must look at the reason(s) for amending claim elements before deciding that no range of equivalents will apply to them. If the amendments were intended to limit the element, for example, to avoid prior art, then they may limit the doctrine of equivalents. Otherwise, they may not. In so ruling, the Court rejected what it saw as an overly rigid, inflexible and literalistic limitation.<sup>28</sup>

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22. *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722 (2002).

23. *See Pennwalt Corp. v. Durand-Wayland Inc.*, 833 F.2d 931, 936-39 (Fed. Cir. 1987) (en banc), *cert. denied*, 485 U.S. 1009 (1988).

24. *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 234 F.3d 558, 566-69 (Fed. Cir. 2000) (en banc), *vacated and remanded*, 535 U.S. 722, (2002).

25. *Festo Corp.*, 535 U.S. at 740.

26. The Supreme Court approved the element-by-element rule in *Warner-Jenkinson Co. v. Hilton Davis Chemical Co.*, 520 U.S. 17, 29 (1997).

27. *Festo Corp.*, 535 U.S. at 737-39.

28. *Id.* at 737-38.

It may help understanding to apply the element-by-element doctrine to the *Sumitomo* case. At first glance, the element-by-element approach would seem to vitiate the doctrine of equivalents, since the two elements (core and cladding) must act in synergy to realize the desired effect of total internal reflection. Yet one could just as easily reason that the positively doped core in the patented invention is the equivalent of the undoped core used by the defendant, since it provides a higher index of refraction relative to the cladding, while the defendant's negatively doped cladding is equivalent to the patentee's undoped cladding for the same reason. Whether this reasoning could sustain the result in *Sumitomo*, however, is unclear, for that decision predated *Festo*.

As for the second limitation, the Supreme Court was clearly right as a matter of substance. If the doctrine of equivalents is to exist at all, with all its problems, it cannot be subverted by amendments that have nothing to do with patent scope or prior art. The "complete bar" rule that the Federal Circuit had proposed would only have discouraged amendments to claims and made them a trap for the unwary. It might also have encouraged more care in patent prosecution but undoubtedly would have occasioned more delay and expense, as every trial of patent infringement would have blossomed into minute examination of the prosecution history of every relevant claim element.

The High Court, of course, rested its decision on the language of the statute and on precedent, not policy.<sup>29</sup> As a result, it did not disturb the essence of the doctrine of equivalents: that ideas as to what is "equivalent" must come from something besides the claims under analysis and semantics, namely science and technology. Fortunately, an old precedent recites a number of factors—all practical matters of science and technology—which bear on what is "equivalent" to what.<sup>30</sup>

## II. THE PROBLEM OF "OBVIOUSNESS"

So far, we have looked at Jefferson's problem backwards, focusing on the question of patent scope and infringement before considering what is patentable. We have done so because the doctrine of equivalents illustrates so beautifully the futility of seeking a solution in claim semantics alone.

But now we must come to the essence of the problem: determining what *else* an invention must have besides novelty to justify what

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29. *Id.* at 737-40.

30. See *Graver Tank & Manufacturing Co. v. Linde Air Products Co.*, 339 U.S. 605, 609-11 (1950) (majority opinion).



Jefferson called “the embarrassment of an exclusive patent.”<sup>31</sup> That “embarrassment,” economists now know, is a standard set of evils associated with nearly every monopoly: higher prices, lower output, less responsiveness to customers, slower innovation, and less product variety, as compared to a fully competitive market. When does the benefit of providing financial incentives for innovation outweigh this “embarrassment,” and can we express the answer in Jefferson’s “general rules”?

Of course our statute propounds an answer: an invention’s nonobviousness with respect to prior art. If the invention as a whole would have been obvious to a person of ordinary skill in the art at the time it was made, it is not patentable.<sup>32</sup> This criterion makes patentability depend on inferred cognitive difficulty, rather than any of the much sounder and more realistic criteria that innovators and their investors actually use in the real world.

I have lambasted this economically vapid abstraction in three earlier articles,<sup>33</sup> in one of which I proposed an economically sensible (and litigable!) substitute.<sup>34</sup> I will not repeat the criticism here. Suffice it to say that virtually everyone who has studied the subject is skeptical of this criterion as a sound general solution to Jefferson’s problem, let alone an economical one, although a recent economically-oriented paper suggests that it at least points generally in the right direction.<sup>35</sup>

But again feeling a mandate to simplify doctrine and reduce uncertainty and expense, the Federal Circuit tried to simplify what about prior art makes an invention “obvious.” An invention requiring a

31. *Graham v. John Deere Co.*, 383 U.S. 1, 9 (1966) (quoting WRITINGS OF THOMAS JEFFERSON, *supra* note 7, at 180–81).

32. 35 U.S.C. § 103(a).

33. See Dratler, *Fixing*, *supra* note 15, at 69-75 (proposing modern economic criteria, well accepted in the business world, to replace the nonobviousness requirement, and explaining the reasons for and advantages of doing so in footnotes); Jay Dratler, Jr., *Invention is a Process, or Why the Electronics and Pharmaceutical Industries are at Loggerheads over Patents* 44-48 (U. of Akron Legal Studies Research, Paper No. 06-13, July 2006), available at [http://papers.ssm.com/sol3/papers.cfm?abstract\\_id=899924](http://papers.ssm.com/sol3/papers.cfm?abstract_id=899924) [hereinafter, Dratler, *Process*] (describing how economic error of basing patentability on cognitive difficulty—nonobviousness—arose out of related error of confusing extended process of invention with single, abstract act of conception); Jay Dratler, Jr., *Alice in Wonderland Meets the U.S. Patent System*, 38 AKRON L. REV. 299, 309-19 (2005) (arguing that current standard of nonobviousness departs from the spirit of Framers’ original standard by emphasizing cognitive difficulty over economic factors like risk).

34. Dratler, *Fixing*, *supra* note 15, at 69-75.

35. Michael J. Meurer & Katherine J. Strandburg, *Patent Carrots And Sticks: A Model Of Nonobviousness*, 12 LEWIS & CLARK L. REV. 547 (2008) (using rough quantitative and graphical analysis to suggest that the nonobviousness criterion at least is not inconsistent with rational patent incentives).

combination of prior art is obvious, it decreed, if and only if a “teaching, suggestion or motivation” appears in the prior art to combine them. Apparently the court included the word “motivation” for flexibility. But in practice it nearly always required an explicit suggestion to combine the prior-art references in order to render the invention obvious and therefore unpatentable.<sup>36</sup>

In its *KSR* decision, the Supreme Court disagreed.<sup>37</sup> Reviewing the statute, its legislative history, and its own relevant precedent, the High Court rejected the so-called “TSM” test as too rigid, formalistic, and narrow.<sup>38</sup> Obviousness, it said, depends upon what the hypothetical person of ordinary skill in the art (“HYPOSA”) would know and would think, which is, in all cases, a matter of evidence and proof.<sup>39</sup> It thus rejected the Federal Circuit’s attempt to simplify doctrine and increase certainty by essentially procedural means. The High Court thereby promoted the usual cause of substantive justice at any cost.

But implicit in the Court’s holding and reasoning was a much more powerful principle. What an HYPOSA would know or think is a matter of science and technology, extraneous to law and claim semantics. You cannot find it by reading the entrails of claims, and you cannot tease it out by sophistry. You have to consult scientists and engineers themselves, who, after all, are the only candidates for HYPOSA—except in the case of patents on business methods, which we will get to shortly.

So in analyzing what ought to be patentable, as in analyzing what the scope of a patent to be, we come to the same conclusion. You cannot solve Tom Jefferson’s problem purely with words. You have to know something about the invention and the science and technology that underlie it. Without that knowledge, you will not surpass the grasp of medieval monks debating the number of angels that fit upon a pinhead.

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36. See DRATLER & MCJOHN, IP, *supra* note 8, § 2.06[6] (discussing Federal Circuit’s TSM test, now repudiated by the Supreme Court).

37. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 419-21 (2007).

38. *Id.* at 419 (stating “The obviousness analysis cannot be confined by a formalistic conception of the words teaching, suggestion, and motivation, or by overemphasizing the importance of published articles and the explicit content of issued patents”); see also *id.* at 427–28 (characterizing “teaching, suggestion, or motivation” test as “narrow,” “rigid,” and inconsistent with the statute and case law).

39. *Id.* at 420 (stating Federal Circuit erred in assuming “that a person of ordinary skill attempting to solve a problem will be led only to those elements of prior art designed to solve the same problem”); *id.* at 420–21 (rejecting the Federal Circuit’s narrow restriction on applicable prior art because “[c]ommon sense teaches . . . that familiar items may have obvious uses beyond their primary purposes, and in many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle”).

### III. WHAT PATENTS MEAN

At this point, it is useful to break up our review of High-Court reprimands with an instance in which the Federal Circuit's simplification effort succeeded. Before it took up the issue, deciding what claim language means could be an extensive, expensive process. Courts addressing claim construction might consider affidavits or live testimony of the inventor, the claim drafter (if different), and third parties, including interested parties and putatively disinterested experts.<sup>40</sup>

All that came to a screeching halt after the Federal Circuit's decision in *Vitronics*.<sup>41</sup> The court ruled that the claims themselves, the patent specification (narrative description and drawings), and the file history of patent prosecution are the only readily accessible "public record" of what a patent's claims mean.<sup>42</sup> As such, it said, they should be the first evidence used to construe the claims.<sup>43</sup> Resort to other evidence—especially nonpublic testimony of parties and experts—should be made only in *extremis*, when and only when, after all else, ambiguity still remains.<sup>44</sup>

A later en banc decision, holding that claim construction is a matter of law,<sup>45</sup> produced dissenting and concurring opinions that appeared to challenge the full court's preference for so-called "intrinsic" evidence (intrinsic to the patent and its prosecution history).<sup>46</sup> Judge Newman, in her "additional views," summed up these critiques as follows:

The value of extrinsic evidence in claim interpretation is not surprising, because patent documents are written by and for persons in the field of the invention, not for judges. Judges not only need a larger understanding of the science or technology, but we also need help with

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40. See DRATLER & MCJOHN, IP, *supra* note 8, § 2A.03[1][c] (discussing evidence used in construing claims).

41. *Vitronics Corp. v. Conceptoronic, Inc.*, 90 F.3d 1576, 1582-83 (Fed. Cir. 1996).

42. *Id.* at 1583.

43. *Id.*

44. *Id.*

45. *Cybor Corp. v. FAS Technologies, Inc.*, 138 F.3d 1448, 1454, 1456 (Fed. Cir. 1998) (en banc) (holding that claim construction is pure issue of law, and implying that evidence "extrinsic" to the patent and its prosecution history is secondary and useful only for informing legal analysis).

46. See *id.* at 1472 (Mayer, C.J., joined by Newman, J., concurring, relying heavily on expert testimony below); see also *id.* at 1474 (Rader, J., asserting that trial judges often rely on expert testimony to construe claims, and criticizing majority's view that such testimony only helps "understand" them); see also *id.* at 1475, 1477-78 (noting trial judges' need for expert testimony and frustration with limitations on its use at trial on claim construction); see also *id.* at 1479-80 (Newman, J., joined by Mayer, C.J., in "additional views," interpreting majority's ruling as holding that the Federal Circuit "will not consider factual findings of the trial court, [and] expressly disavowing such actions by prior panels," and criticizing that rule as unhelpful to trial judges).

understanding how the particular terms as used in the patent are viewed by persons in the field of the invention.<sup>47</sup>

Her views in this regard are worthy of note, because she has the most intimate acquaintance with science of any judge on the court: a Ph.D. in Chemistry and four years as a research scientist.<sup>48</sup>

As an ex-scientist, too, I have great sympathy with Judge Newman's general point. But I think in this case her aim was misdirected. Under our law today, a patent is *supposed* to be a self-contained semantic system. The specification describes what the invention is, and the claims fix its legal limits.

Today, lawyers nearly always draft the claims, after reading and massaging the inventor's specification and collaborating at great length with him or her. If these worthies cannot produce something on which they are willing to rely, and which the public can retrieve on-line to assess the extent of patent protection, what good is a patent? In particular, what good are claims?

If the patent is not the self-contained semantic system that it is supposed to be, we ought to throw it out and go back to a general description of what the invention is (central claiming) and have a full trial on its validity, scope and infringement, with a battle of the experts in every case. For if we cannot rely on the patent for anything solid, then drafting, prosecuting, and issuing it probably expend much more effort, time and money, and accomplish much less, than is required to provide reasonable incentives for innovation.

Where Judge Newman's insights have real bite, in my view, is when we go outside the self-contained semantic system of the patent and its prosecution history into the real world. That is what happens when we compare the patent (and its already-construed claims) to prior art in order to assess its validity, and when we compare the construed claims, either literally or by equivalents, to an accused device to assess infringement. Then there can be no pretense that the patent is self-contained, or that the teachings of science and technology, brought into the courtroom through the HYPOSA or other witnesses, should not play a leading role.

This economy of approach is even more important today, when claim construction in hard-fought cases routinely takes an appeal to the

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47. *Id.* at 1480 (Newman, J., joined by Mayer, C.J., "additional views").

48. Judge Newman's official biography, [http://www.cafc.uscourts.gov/index.php?option=com\\_content&view=article&id=126:pauline-newman-circuit-judge&catid=1:judges&Itemid=24](http://www.cafc.uscourts.gov/index.php?option=com_content&view=article&id=126:pauline-newman-circuit-judge&catid=1:judges&Itemid=24) (last visited Oct. 19, 2010).

Federal Circuit and sometimes two. If the trial required a full battle of experts and others, we might double the cost of deciding just what the claims mean. So while there is merit in Judge Newman's general point that patent law cannot ignore science and technology, we can, without undue injustice or unfairness, dispense with so-called "extrinsic evidence" in construing the words that inventors and their attorneys themselves drafted to describe inventions. In that sense, the *Vitronics* rule seems, at least to me, the most sensible and successful outcome of the Federal Circuit's simplification efforts.

#### IV. BUSINESS-METHOD PATENTS

This brings us to *Bilski*.<sup>49</sup> I have railed against business-method patents in at least two articles.<sup>50</sup> I will not bore the reader by repeating or even summarizing their substance here. Suffice it to make a prediction: if any nation with serious innovative capacity (China, maybe?) were to refuse to follow our lead and decline to recognize business ideas as patentable inventions, it would gradually pull away from us in *real* industrial innovation—and by virtue of a far less costly and wasteful patent and patent-licensing system—like a sailboat with better trimmed sails.

Doing so might be risky from an international trade perspective, for the TRIPs Agreement treats *all* subject matter as eligible for patenting, without exception for business methods.<sup>51</sup> Although *State Street*<sup>52</sup> was still more than two years away when the TRIPs Agreement was ratified, we and other WTO members might still argue that the international

49. *Bilski v. Kappos*, 130 S. Ct. 3218 (2010).

50. See Dratler, *Fixing, supra* note 15, at 62-64 (proposing language for patent act revision, which would outlaw business-method and most software patents, and explaining why in footnotes); Jay Dratler, Jr., *Does Lord Darcy Yet Live? The Case Against Software and Business-Method Patents*, 43 SANTA CLARA L. REV. 823, 840-53, 871-76 (arguing that business methods involve market risk more than technological risk and therefore are inappropriate for patent incentives, and that patents on business methods erase the line between unlawful business monopolies and temporary patent monopolies in place since the Statute of Monopolies was enacted nearly four centuries ago).

51. See Agreement on Trade-Related Aspects of Intellectual Property Rights, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1C, THE LEGAL TEXTS: THE RESULTS OF THE URUGUAY ROUND OF MULTILATERAL TRADE NEGOTIATIONS 320 (1999), 1869 U.N.T.S. 299, 33 I.L.M. 1197 (1994) (TRIPs Agreement), Art. 27, available at [http://www.wto.org/english/tratop\\_e/trips\\_e/t\\_agm3c\\_e.htm#5](http://www.wto.org/english/tratop_e/trips_e/t_agm3c_e.htm#5) (last visited Oct. 19, 2010).

52. *State St. Bank & Trust Co. v. Signature Fin. Group, Inc.*, 149 F.3d 1368, 1375-77 (Fed. Cir. 1998) (taking opportunity to "lay to rest" what the court saw as "ill-conceived exception" to patentable subject matter for business methods).

community painted itself into a corner that cannot be exited without a massive renegotiation unlikely ever to happen.

That is only one of many reasons why the Supreme Court's decision in *Bilski* was much ado about nothing. There are three others. First, despite the length of its splintered opinions, the Court did little more than instruct the Federal Circuit to do what we tell our students to do: mind the language of the statute and precedents.<sup>53</sup> It rejected the Federal Circuit's "machine or transformation" test as having no basis in the patent statute or the High Court's many decisions on judge-made exclusions from patentable subject matter.<sup>54</sup>

Second, although that instruction was legally right and proper, it is likely to do little good. The Federal Circuit has tried on its own for nearly three decades to draw the line between abstract ideas and concrete inventions, with many self-reversals and without notable success.<sup>55</sup> If the task were easy, it would have been done by now.

Finally, the Supreme Court majority failed to do—or to invite and authorize the Federal Circuit to do—two things that might have helped cut the Gordian knot: (1) consider economic criteria in considering what is patentable, and (2) receive the wisdom of scientists and engineers. I suspect that scientists and engineers would be virtually unanimous, if polled, in believing that one-click shopping, for example, is not a patentable invention, regardless of whether one conceives it as a new, useful, and (from a purely business perspective) nonobvious advance. As for *State Street*, when I ask my students with programming experience whether they see themselves as "inventing" while doing routine programming for business, engineering, or home purposes, they just laugh.

Why does subject matter make a difference? The current rage is to opine, without much solid evidence, that careful application of the novelty, utility, and nonobviousness requirements would eliminate all the spurious patents that a stricter review of subject matter might. But even if so, those requirements would not eliminate the expense.

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53. See *Bilski*, 130 S. Ct. at 3226-27 (majority opinion). The Court limited its holding carefully, saying "the patent law faces a great challenge in striking the balance between protecting inventors and not granting monopolies over procedures that others would discover by independent, creative application of general principles. Nothing in this opinion should be read to take a position on where that balance ought to be struck." *Id.* at 3228.

54. *Id.* at 3327-28.

55. For an in-depth review, see DRATLER & MCJOHN, IP, *supra* note 8, § 2.03[3], esp. [c].

Full-bore patent litigation in major cities today costs each side over \$5 million dollars, in some cases approaching \$10 million.<sup>56</sup> The beauty of enforcing subject-matter limitations as the High Court once did<sup>57</sup> is that they do not require claim construction, analysis of prior art, or exhaustive analysis of infringement both literally and by equivalents. Subject-matter limitations are matters of law, enforceable on summary judgment, perhaps with one appeal. Applied strictly in light of the patent system's economic purposes, they would vastly cut the amounts we waste in prosecuting, licensing, and litigating patents on non-inventions.

Of course there are doctrinal and practical impediments to this rosy picture. Congress muddied the waters considerably by mentioning business methods in the defense in section 273,<sup>58</sup> thereby implying approval of them. Many businesses have invested heavily in them and would scream bloody murder if the courts or Congress threatened to take them away. But I suspect that more thoughtful business leaders, especially those involved in *real* industrial innovation, would see their demise much like trimming the "thickets" of electronic and software patents against which so many real innovators testified early in this decade.<sup>59</sup>

One final reason why *Bilski* did little was that it did not touch *State Street's* most controversial holding: that the rule against patenting business ideas was ill advised and in fact never existed.<sup>60</sup> Until someone

56. Bart Showalter, Baker Botts LLP, Cost of Patent Litigation, paper delivered at AILPA Midwinter Conference (Jan. 25, 2008), available at [http://www.aipla.org/Content/ContentGroups/Speaker\\_Papers/Mid-Winter1/20083/Showalter-slides.pdf](http://www.aipla.org/Content/ContentGroups/Speaker_Papers/Mid-Winter1/20083/Showalter-slides.pdf) (last visited Oct. 19, 2010), Slide 7 (after title slide).

57. See, e.g., *Diamond v. Diehr*, 450 U.S. 175, 185 (1981) (asserting "laws of nature, natural phenomena, and abstract ideas" cannot be patented) (dictum); *Parker v. Flook*, 437 U.S. 584, 594-95 (1978) (stating mathematical formula is not patentable, even as limited to use in cracking hydrocarbons); *Gottschalk v. Benson*, 409 U.S. 63, 67, 71-72 (1972) (holding that algorithm for converting binary-coded decimal numbers to binary numbers in digital computers is not patentable); *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 130 (1948) (saying combination of naturally occurring nitrogen-fixing bacteria was not patentable subject matter, although particular combination was not found in nature); *O'Reilly v. Morse*, 56 U.S. 62, 112-21 (1853) (explaining principles of electromagnetism are not patentable, even if confined to telecommunication).

58. 35 U.S.C. § 273, esp. (a)(3).

59. See FEDERAL TRADE COMMISSION, TO PROMOTE INNOVATION: THE PROPER BALANCE OF COMPETITION AND PATENT LAW AND POLICY, at 6 (Oct. 28, 2003) (Executive Summary discussing effects of huge patent portfolios), available at <http://www.ftc.gov/opa/2003/10/cpreport.htm> (visited Oct. 19, 2010); *id.* at ch. 3, 34-37 (discussing how patent thickets impede innovation in electronics industry); *id.* at ch. 3, at 50-55 (similar analysis for software and Internet industries).

60. *State St. Bank & Trust Co. v. Signature Fin. Group, Inc.*, 149 F.3d 1368, 1375-77 (Fed. Cir. 1998).

dares to bring *that* issue before the high Court, most of the points of law and economics in this section will be moot.

To sum up: *Bilski* represents another mild reprimand of the Federal Circuit for failing to follow higher authority in statute and precedent. But it failed to provide much guidance for doing so, preferring instead to advise, in effect, “use good judgment.” Most of all, it failed to give any hint whether considering the purpose of patents, the history of the Patent and Copyright Clause, and our vastly greater understanding of economics today is appropriate for any court, let alone an inferior court, in solving the subject-matter riddle specifically or Thomas Jefferson’s problem generally.

#### V. C.P. SNOW’S *TWO CULTURES*

There are other cases in which the Supreme Court reversed the Federal Circuit. But there is little to say about them, except that the High Court properly rejected crabbed, narrow and formalistic interpretations of principles of law not unique to patents. In *eBay*,<sup>61</sup> the High-Court rejected a “matter of course” rule for granting injunctions in patent cases and instructed the Federal Circuit to apply the same four-factor test that every other court applies in every other matter. In *MedImmune*,<sup>62</sup> the High-Court rejected an interpretation of Article III erroneously based on the parties’ relative strategic advantage and instructed the Federal Circuit and lower courts to return to controlling principles of separation of powers on which the “case or controversy” requirement is based.<sup>63</sup>

But as injunctions and declaratory judgments are not unique to patent law, the effect of the High Court’s decisions in *eBay* and *MedImmune* was merely to bring the Federal Circuit’s supervision of patent law back into line with the law generally. Those cases did nothing to change or adjust the Federal Circuit’s view of principles of pure patent law.

What is missing from all this supposed ferment is badly needed re-adjustment of the relationship between our patent system and the science and technology that it purports to advance. Fundamental questions remain whether patents on the results of basic research—pieces of a

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61. *eBay, Inc. v. MercExchange, L.L.C.*, 547 U.S. 388, 391-92 (2006) (holding that permanent injunctions in patent cases, as in other cases, require satisfaction of traditional four-part equitable test).

62. *MedImmune, Inc. v. Genentech, Inc.*, 549 U.S. 118, 130-31,137 (2007).

63. See JAY DRATLER, JR., *LICENSING OF INTELLECTUAL PROPERTY* § 2A.02[1] (L.J. Press 1994 & Supps.).



puzzle discovered long before any commercially valuable solution—are counterproductive, if not massively so.<sup>64</sup> The doctrine of constructive reduction to practice, which lets lawyers and others “invent” paper abstractions, lie in the weeds and hold up real industries and their substantial investment for ransom, remains unmodified, although it is a judicial invention appearing nowhere in the statute.<sup>65</sup> The criterion of “nonobviousness,” so obviously (pardon the expression) out of step with modern economic learning about how innovation actually works in the marketplace,<sup>66</sup> remains free not only from reconsideration by Congress, but from any attempt by the courts to infuse it with economic meaning beyond the minimalist steps of the *Graham* Court forty-four years ago.<sup>67</sup>

The High Court seems to re-invent fundamental doctrines of constitutional law every few years. We who labor in the remote fields of IP can only look with jealousy on its willingness to reconsider basic principles there. Within the interstices of a patent statute that still leaves much unsaid and much room for interpretation, the high Court is palpably more cautious. I suspect the reason is what C.P. Snow, in his famous eponymous book four decades ago, called *The Two Cultures*.<sup>68</sup>

Science and technology comprise as different a culture from law as is possible to imagine. No two scientists would ever decide a technical dispute by picking champions and paying them to argue before a presumably neutral decision maker, any more than lawyers would resolve a business dispute by turning on their precision instruments and pulling out their pocket calculators. The gulf of misunderstanding between the two cultures is undoubtedly as large, if not larger, than that between Americans and Chinese or Americans and Afghans.

Good judges seem to understand this. One of the most candid and poignant acknowledgments came early in our national history. In 1841, Justice Story, then a circuit judge, penned the following description in a copyright fair-use case:

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64. See Jay Dratler, Jr., *Combinatorial Mathematics and the Problem of Early-Stage Patents in Biotechnology* (U. of Akron Legal Studies Research, Paper No. 07-02, Jan. 2007), available at [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=959462](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=959462).

65. See Dratler Process, *supra* note 33, at 31-44.

66. See sources cited *supra* note 33.

67. *Graham v. John Deere Co.*, 383 U.S. 1, 11 (1966) (stating “The inherent problem [underlying nonobviousness and earlier similar criteria] was to develop some means of weeding out those inventions which would not be disclosed or devised but for the inducement of a patent”).

68. The original book came out in 1959. Modern versions have additional material added in the 1960s and 1970s. See, e.g., C.P. Snow & Stefan Collini, *The Two Cultures* (Canto) (Cambridge Univ. Press 1998) (1959).

Patents and copyrights approach nearer than any other class of cases belonging to forensic discussions, to what may be called the metaphysics of the law, where the distinctions are, or at least may be very subtle and refined, and sometimes, almost evanescent.<sup>69</sup>

Judge Smith of the Second Circuit echoed this lament by quoting Justice Story approvingly 136 years later.<sup>70</sup>

This attitude is hardly surprising. From the very foundation of our Republic, the leaders of all three of our Branches were lawyers and other men of affairs. Only one of the thirty-nine signatories to our Constitution—Benjamin Franklin—could reasonably have been described as a “scientist” in the modern sense of that term. Among the broader circle of our Founders, only Franklin and Thomas Jefferson occupied themselves with technology. Franklin did experiments with lighting and invented the lightning rod, and Jefferson invented plows and other agricultural implements. That makes two among some fifty-odd Founders.

Modern experimental and observational science is generally thought to have arisen in the 1620s, with Galileo’s invention of various improvements on telescope and his use of them to study the heavens—work that later helped inspire and inform Sir Isaac Newton’s path-breaking theory of gravitation. A span of well over a century intervened between those seminal developments in human thinking and ratification of our Constitution in 1791. Our Founders, all well-educated men, were generally aware of them. Yet they simply did not consider them important, let alone vital, to commerce or government. Nor, except for Franklin and Jefferson, did they study them in detail.

Those were the days before the dawn of the Industrial Revolution in America. So what we now call science and technology were objects of purely “philosophical” interest, falling under the heading of “natural philosophy.” They were matters of curiosity for men of means and learning, not matters of vital business or everyday concern as they are today.

Thomas Jefferson’s own story is illustrative. He had a strong interest in science and technology, particularly as regards agriculture, and he made several inventions himself. He therefore took an interest in patent law, was partly responsible (along with James Madison) for the Patent and Copyright Clause of our Constitution, drafted our first patent statute, and helped set up and run our first patent office. But his

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69. *Folsom v. Marsh*, 9 F.Cas. 342, 344 (C.C.D. Mass. 1841) (No. 4901).

70. *Meeropol v. Nizer*, 560 F.2d 1061, 1068 (2d Cir. 1977).

involvement lasted only a few years before he turned away to “higher duties.”

The gap between the two cultures has only widened since Jefferson. In his day, the law was sufficiently contained that a learned person could master it and still dabble in other pursuits, like astronomy and plows.<sup>71</sup> Today, the law is an all-consuming profession, from law school on. Judges must have extensive legal training, which presupposes a verbal and literary bent, not a scientific, technological, or quantitative one. People go to law school, rather than engineering or science schools, because they like to deal with people and words more than with things and numbers. Their personal acquaintance with science, technology (and their handmaiden mathematics) is therefore largely peripheral and coincidental.

The composition of the Federal Circuit itself illustrates this point.<sup>72</sup> Insofar as appears in their official biographies and other information readily available on the Internet, its fifteen judges have the following training and experience in science and technology:

Regular or Senior Status	Scientific or Technical Undergraduate Degree	Scientific or Technical Graduate Degree	Experience as Scientist or Engineer	Practice as Patent Agent, Examiner or Attorney	Teaching Patent Law
Regular Status	4/11 or 36%	3/11 or 27%	2/11 or 18%	4/11 or 36%	3/11 or 27%
Senior Status	1/4 or 25%	0/4 or 0%	0/4 or 0%	0/4 or 0%	1/4 or 25%

As this table shows, the regular judges’ technical training and experience vastly exceeds those of judges on senior status. But in no case does any aspect of technical training or experience, including experience with the patent system as a patent agent, attorney, or examiner, exceed 40%. In other words, on each measure of training or experience, the majority of judges on the Federal Circuit have none beyond their experience on the Federal Circuit itself, or, in some cases, its predecessor courts. (A majority has *some* relevant training or

71. See *Graham*, 383 U.S. at 6-10.

72. The table and data below are derived from the judges’ official biographies on the Federal Circuit’s official website, <http://www.cafc.uscourts.gov/index.php> (follow “Judges” hyperlink under “THE COURT”) (last visited Oct. 19, 2010). In some cases the subject matter of the judges’ degrees was obtained from other on-line sources.

experience, however, due to the distribution of various aspects of training or experience among members. For example, six out of eleven regular-status judges, or 55%, have one or more of the following: an undergraduate or graduate degree in science or engineering and scientific or technical work experience.)

The Supreme Court is even more barren of scientific or technical expertise. Insofar as official biographies and a quick Web search reveal, not a single member of the High Court has so much as an undergraduate major in any field of science or technology, although Justice Breyer's extensive writings in economics as it relates to law suggest considerable expertise in that field.

Insofar as the unique culture of science and technology are concerned, the good justices have not even landed on the same continent. They are observing the natives through a spyglass from a ship offshore. How, then, can they appreciate what science and invention really entail, not only not ever having done either, but not ever having even *studied* either in any depth?

What does this state of affairs portend for patent law? The Federal Circuit's repeated search for simplicity and certainty in formulaic rules suggests little inclination to address the broad issues of patent reform that so desperately need expert attention. Having had its wings clipped repeatedly in its quest for simplicity and economy, that court is even less likely to spread its wings on the updrafts of economics and the social purpose of the patent system and soar toward fundamental reform.

The High Court, with far less expertise in science and technology than its subordinate court, is even more conscious of its institutional incompetence in matters of that court's special expertise.<sup>73</sup> Far from making bold moves toward institutional reform, even when only judge-made law is at issue,<sup>74</sup> the High Court has limited itself to correcting patent misreadings of applicable statutes and precedents, especially those that apply more broadly than just to patents. So those like me who yearn for fundamental patent reform are unlikely to see it anytime soon, either from a High Court conscious of its limited competence and preoccupied (like Jefferson) with "higher duties," or from a Congress largely captured by special interests in no hurry for reform.

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73. See *Warner-Jenkinson v. Hilton Davis Chem. Co.*, 520 U.S. 17, 40 (1997) (stating, after explaining general principles of equivalence, "expect[ing] that the Federal Circuit will refine the formulation of the test for equivalence in the orderly course of case-by-case determinations, and leav[ing] such refinement to that court's sound judgment in this area of its special expertise").

74. This, of course, is the case with all the judge-made exceptions to patentable subject matter. See *supra* note 57.

