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On the Development of Patent Law

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ON THE DEVELOPMENT OF PATENT LAW

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There is little dispute over what Congress believed it was doing to patent law when it established the U.S. Court of Appeals for the Federal Circuit. Centralizing appellate jurisdiction for patent law was meant to address the widespread perception that the legal infrastructure of patent law was not well managed by the conventional arrangement of regional circuits supervised by the U.S. Supreme Court. The new court, it was thought, would better manage and develop patent law, thereby producing improvements in the uniformity and coherency of the law. This Article examines central features of patent law that the Federal Circuit is conventionally credited with developing—specifically, doctrines of patentability and patent scope—against the background of the court's institutional position in the patent system. From that perspective, the Article explains how the Federal Circuit, while perhaps not perfectly, has moved to rationalize patent law with patent policy and theory.

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I. INTRODUCTION

The U.S. Court of Appeals for the Federal Circuit was established in response to a number of policy concerns that had become especially pressing by the 1970s.[1] The federal courts generally were facing an explosion of litigation.[2] The nation was experiencing a remarkable decline in industrial innovation and economic growth, while simultaneously experiencing double-digit inflation and high unemployment.[3] A Carter administration domestic policy review suggested that one policy approach to relieving the nation's "malaise" was to encourage innovation.[4] But existing studies suggested that innovation was impeded by a lack of uniformity in the application of patent law.[5] There developed a widespread perception that the legal infrastructure of patent law was not well managed by the conventional arrangement of regional circuits supervised by the U.S. Supreme Court.[6]

By passing the Federal Courts Improvement Act of 1982,[7] and thereby creating the Court of Appeals for the Federal Circuit, Congress intended to bring consistency to patent law and restore the incentive for industrial innovation.[8] The Act centralized jurisdiction over patent appeals from the U.S. Patent and Trademark Office ("Patent Office" or "Office"), the U.S. District Courts, the Court of

1. *See generally* THE UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT: A HISTORY 1982–1990 1–14 (Marion T. Bennett ed., 2002) [hereinafter FEDERAL CIRCUIT HISTORY] (chronicling the economic and political circumstances surrounding the creation of the Federal Circuit); *see* S. REP. NO. 97-275 (1981), *reprinted in* 1982 U.S.C.C.A.N. 11; H.R. REP. NO. 97-312 (1981); Charles W. Adams, *The Court of Appeals for the Federal Circuit: More Than a National Patent Court*, 49 MO. L. REV. 43 (1984) (discussing the background and formation of the Federal Circuit); Rochelle Cooper Dreyfuss, *The Federal Circuit: A Case Study in Specialized Courts*, 64 N.Y.U. L. REV. 1 (1989) (same); Donald R. Dunner, *The U.S. Court of Appeals for the Federal Circuit: Its Critical Role in the Revitalization of U.S. Patent Jurisprudence, Past, Present, and Future*, 43 LOY. L.A. L. REV. 775, 776–78 (2010) (same).

2. FEDERAL CIRCUIT HISTORY, *supra* note 1, at 2–3.

3. *Id.* at 8.

4. *Id.*

5. Adams, *supra* note 1, at 55–57; Dreyfuss, *supra* note 1, at 7; *see also* S. REP. NO. 97-275; H.R. REP. NO. 97-312 (1981).

6. Dreyfuss, *supra* note 1, at 6 ("Perhaps because of its own docket problems and its lack of expertise, the Supreme Court rarely reviewed the patent law decisions of the regional circuits. The resulting lack of national guidance created a microcosm of . . . difficulties.").

7. Federal Courts Improvement Act of 1982, Pub. L. No. 9-164, 96 Stat. 25 (codified as amended in scattered sections of 28 U.S.C.).

8. FEDERAL CIRCUIT HISTORY, *supra* note 1, at 12.

Federal Claims, and the Court of International Trade in a single appellate court. As Congress saw it, centralizing jurisdiction for patent appeals should have at least two salutary effects: (1) it should enable the newly created court to manage and develop patent law and (2) it should promote better patent law with improved doctrinal coherence and stability.[9]

Since the creation of the Federal Circuit, the United States has experienced a period of innovation considered by some to be exceptionally impressive. Nonetheless, the ambivalence present at the establishment of the court has persisted in some circles. While there is no shortage of commentators who report that Congress's experiment has had considerable success,[10] there is also no shortage of those who are willing to vociferously proclaim their dissatisfaction with modern patent law.[11]

This Article approaches the question of how well the Federal Circuit has handled the development of patent law by examining central features of patent law that the Federal Circuit is conventionally credited with developing.[12] Specifically, this Article considers developments in the doctrines of patentability and patent scope, against the background of the court's institutional position in the patent system. The overall suggestion of the analysis is that the Federal Circuit, while perhaps not perfectly, has moved to rationalize patent law with patent policy and theory.

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9. R. Polk Wagner & Lee Petherbridge, *Is the Federal Circuit Succeeding?: An Empirical Assessment of Judicial Performance*, 152 U. PA. L. REV. 1105, 1115–16 (2004).

10. *See, e.g.*, Gerald Mossinghoff, *The Creation of the Federal Circuit*, *in* PRINCIPLES OF PATENT LAW 31, 31–32 (4th ed. 2008); Marcia Coyle, *Critics Target the Federal Circuit*, 29 NAT'L L.J. 1 (2006); Rochelle Cooper Dreyfuss, *The Federal Circuit: A Continuing Experiment in Specialization*, 54 CASE W. RES. L. REV. 769, 770–71 (2004) (reporting practitioner views); Dunner, *supra* note 1, at 9 ("The bottom line at the conclusion of the first quarter century of the court's existence is that the court has more than delighted its early proponents and surprised its opponents with its high level of performance.").

11. *See, e.g.*, Craig Allen Nard & John F. Duffy, *Rethinking Patent Law's Uniformity Principle*, 101 NW. U. L. REV. 1619 (2007) (criticizing the court's doctrinal development). *But see* S. Jay Plager & Lynne E. Pettigrew, *Rethinking Patent Law's Uniformity Principle: A Response to Nard and Duffy*, 101 NW. U. L. REV. 1735 (2007) (challenging a number of points and premises upon which Nard and Duffy rely).

12. As the relevant discussions explain, most of these doctrines did not originate with the Federal Circuit. Nonetheless, the court is still conventionally credited (and by some criticized) with amplifying the doctrines' significance and helping the law achieve its current state of development. It should also be clear that the Federal Circuit has worked with the infrastructure of patent law in areas that are not discussed in this Article.

Part II of the Article furnishes the theoretical framework against which the court's performance will be compared. Part III.A considers patentability[13] from the perspective of the law of obviousness. This part explains that the concept underlying the law of obviousness imposes substantial limitations on the legal determinateness[14] its doctrinal rules should be expected to provide. It then examines the Federal Circuit's central contribution to this area of law: the development of a requirement that a determination of obviousness be accompanied by a rationale explaining why a person of ordinary skill in the art would find a patent claim to be obvious. This part then explains why this development can be understood as rationalizing patent law with patent policy and theory. It concludes with the observation that the requirement of an explanatory rationale has a largely unappreciated potential future benefit: it may encourage the future development of the legal part of the obviousness question.[15]

Part III.B.1 considers patent scope from the perspective of the doctrine of equivalents.[16] After introducing the doctrine, this part explains how the doctrine of equivalents has developed to rationalize the way the law addresses information externalities associated with the patent-granting process, thereby seeking to encourage policy favoring good public notice of patent rights. Part III.B.2 considers patent scope from the perspective of claim construction.[17] The analysis here acknowledges that the Federal Circuit has pursued innovation in the law that guides claim construction, and notes that the court's innovation can be understood as moving to rationalize patent law with patent policy and theory. But the analysis also explains that the court seems recently to have abandoned innovation

13. *See infra* Part III.A.

14. As used in this Article, "legal determinateness" means the capacity of the rules of the law when confronted with a claim to a new invention to conclusively settle patentability—without the need to resort to a costly inquiry into easily disputable factual conclusions. *See infra* note 51.

15. The formal structure of obviousness is a very thin legal question sitting atop a costly, heavily factual inquiry. The relevant section speculates that the Federal Circuit's work in this area creates an environment for thickening—increasing the decisional significance of—the legal question. This might someday lead to obviousness determinations that need rely less heavily on genuinely disputable factual conclusions.

16. *See infra* Part III.B.1.

17. *See infra* Part III.B.2.

in this area in a way that might indicate a derationalization of patent law. The Article finishes with a brief conclusion.

II. THEORETICAL FRAMEWORK

The Introduction provides the theory of the Federal Circuit—developer of a better patent law—against which the court's performance will be considered in the remainder of this Article. However, the observations presented in this Article rely heavily on two additional theoretical foundations. As I describe in more detail below, the first is a fairly conventional—but perhaps not universally agreed upon—view of the incentives provided by patent law. The second is a theory of the patent-granting process and of the costs that process imposes on the patent system.

A. Theory of Patents

Patent law is just one part of a large and complex system of incentives and disincentives that, by making benefits possible and imposing costs, affect innovation and competition. In very general terms, patent law is a collection of rules that create a form of property,[18] exclusive rights[19] enforceable against others in the jurisdiction, with the traditional remedies for infringement including damages for past infringement and an injunction[20] prohibiting future infringing acts.

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18. A point about which the Supreme Court and Congress have been explicit. 35 U.S.C. § 154(a)(1) (2006) ("Every Patent shall contain . . . a grant to the patentee, his heirs or assigns, of the right to exclude others from making, using, offering for sale, selling . . . or importing the invention . . . ."); *id.* § 261 ("Subject to the provisions of this title, patents shall have the attributes of personal property."); Transparent-Wrap Mach. Corp. v. Stokes & Smith Co., 329 U.S. 637, 643 (1947) (reversing a determination that a patent licensing agreement violated antitrust laws and stating, "A patent is a species of property. It gives the patentee or his assignee the 'exclusive right to make, use, and vend the invention or discovery' for a limited period."); Consol. Fruit-Jar Co. v. Wright, 94 U.S. 92, 96 (1877) (affirming a determination of invalidity and stating, "A patent for an invention is as much property as a patent for land. The right rests on the same foundation, and is surrounded and protected by the same sanctions. There is a like larger domain held in ownership by the public. Neither an individual nor the public can trench upon or appropriate what belongs to the other.").

19. U.S. CONST. art. I, § 8, cl. 8. (reflecting that delegates to the 1787 Constitutional Convention agreed that the U.S. Congress should have the power to impose a patent system to "promote the Progress of Science and useful Arts by securing . . . to . . . Inventors the exclusive Right to their . . . Discoveries").

20. Patent law, like all property systems, substitutes other remedies in certain cases. The use of substitute remedies may become more pronounced after *eBay, Inc. v. MercExchange, L.L.C.*, 547 U.S. 388 (2006).

Within the milieu of innovation and competition, the rights furnished by patent law are generally understood to provide a number of discrete incentives. The exact content of the list of incentives, as well as the relative social importance of each, is a matter of continuing debate. However, the following incentives are likely to be found on any conventional[21] list: The incentive to invent—the idea that patent law encourages the creation of inventions; the incentive to disclose—the idea that patent law encourages public accessibility to information about inventions by publication of the patent document, and, in some instances, by encouraging public practice of embodiments of an invention; the incentive to design around (or follow on)—the idea that once an invention and its attendant rights are made known to the public, others will be encouraged to build on it to make noninfringing or, perhaps, infringing improvements; and the incentive to commercialize[22]—the idea that knowledge of an invention and its attendant rights encourages parties to invest in acquiring the control necessary to develop and market products embodying the invention.

This Article adopts the understanding that the rights made available through patent law are generally capable of providing these incentives.[23] It is also worth emphasizing that the concepts of the latter two incentives—the incentive to design around and the incentive to commercialize—include the principle that public notice of an invention and its attendant rights is crucially important.[24] The basic idea is that more predictable rights can make innovation more efficient. Good public notice helps to channel investment away from

21. KIEFF ET AL., THE PRINCIPLES OF PATENT LAW: CASES AND MATERIALS 65–71 (4th ed. 2008).

22. Similar concepts are known under the labels "incentive to invest" and "incentive to innovate."

23. To be clear, the theory described here does not maintain that patent rights provide these incentives in every case. Nor does it maintain that changes to patent law implemented to encourage the benefits of one incentive will necessarily have the effect of encouraging the benefits of another incentive. Doctrinal changes focused on encouraging the benefits of once incentive might leave remaining incentives unaffected, or might diminish the benefits possible through another inventive.

24. *See* Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 535 U.S. 722, 730–31 (2002) ("The patent laws 'promote the Progress of Science and useful Arts' by rewarding innovation with a temporary monopoly. U.S. CONST. art. I, § 8, cl. 8. The monopoly is a property right; and like any property right, its boundaries should be clear. This clarity is essential to promote progress, because it enables efficient investment in innovation.").

duplicative projects and encourages investment and deal making around patented subject matter.

Finally, the Article adopts the understanding that claims to inventions that meet or exceed the substantive statutory requirements for patenting are those that, as a normative policy matter, should be granted.[25]

B. Theory of the Patent-Granting Process

In the patent system, the responsibilities of the Patent Office and of the courts might be thus summarized: The Patent Office receives applications for patents. It examines claims of invention made in applications to ensure that they meet or exceed the legal requirements that define when a patent should issue. In cases in which claims do not, the Office denies them. In cases in which they do, the Office allows them, and they normally issue as part of a patent. Overall, the Patent Office grants patents in substantial numbers.[26]

Courts, on the other hand, are tasked with determining the legal scope of the rights conferred by patent claims and with determining whether accused products and processes infringe those rights. These tasks are confronted in patent litigation, a context in which some interested party (often an accused or potential infringer) may also contend that the subject patent claim or claims never should have issued. In those cases, courts are also called upon to review the legal and factual correctness of the Patent Office's decision to grant a patent.[27]

This simple structural description of the role of the Patent Office and of the courts elides entirely a number of gritty, but important,

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25. To be sure, courts help define what statutes mean and so there is the risk of some degree of circularity in this construct. To be clear the construct is adopted to exclude other (nonstatutory) normative preferences for what it should take to get a patent either generally, or with respect to particular subject matter. It thus serves to adopt the statutory standards as the proper target for judge-developed doctrine.

26. Mark A. Lemley & Bhaven Sampat, *Is the Patent Office a Rubber Stamp?*, 58 EMORY L.J. 181, 181–82 (2008). *See generally* 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) (discussing and analyzing grant rates in USPTO from 1981 through 2001); Cecil D. Quillen, Jr. & Ogden H. Webster, *Continuing Patent Applications and the U.S. Patent and Trademark Office—Updated*, 15 FED. CIR. B.J. 635 (2006) (same through 2005).

27. Courts—primarily but not exclusively the Federal Circuit—also review Patent Office refusals to issue a patent.

details of not only the process of patent-granting but also the costs the patent-granting process imposes on the patent system. To begin with, the Patent Office's examination of claims of invention in patent applications is intended to be nothing more than "a rough 'first cut' at determining [the] validity" of the claims.[28] To be clear about it, the Patent Office's limited evaluation of applications, even if not precisely as designed, is probably sensible in a larger context. Very few patents have real marketplace value,[29] in the sense that they are ever licensed or asserted against a competitor. Accordingly, making a substantial expenditure to perform a detailed examination of the claims of any individual patent application is (probabilistically) akin to making a substantial expenditure to shine up trash.[30] Limiting these sorts of expenditures can, therefore, be understood theoretically as fairly sound social judgment.

The Patent Office's limited evaluation of patent applications, however, has consequences. First, it probably means that the Patent Office allows a nontrivial number of claims directed to inventions that are unpatentable. It probably also means that the Patent Office rejects a nontrivial number of claims directed to inventions that are (or should be) patentable. There are social costs—in terms of efficiency of innovation and competition—to both of these events.[31] Second, the Patent Office's limited evaluation of claims amplifies the impact of strong incentives for patentees to seek, and for the Patent Office to issue, patents with claims that do not meet the statutory

28. ROBERT P. MERGES & JOHN F. DUFFY, PATENT LAW AND POLICY: CASES AND MATERIALS 1046–47 (4th ed. 2007).

29. This view is based on the best available information, and is fairly conventional. *See* Mark A. Lemley & Carl Shapiro, *Probabilistic Patents*, 19 J. ECON. PERSP. 75, 80–83 (2005); Gideon Parchomovsky & R. Polk Wagner, *Patent Portfolios*, 154 U. PA. L. REV. 1, 18–19 (2005). Some potentially contradictory information exists, however. *See* Ted Sichelman, *Commercializing Patents*, 62 STANFORD L. REV. 341, 362–63 (citing surveys reporting roughly 50 percent commercialization rates).

30. *See* Mark A. Lemley, *Rational Ignorance at the Patent Office*, 95 NW. U. L. REV. 1495, 1497 (2001) ("In short, the PTO doesn't do a very detailed job of examining patents, but we probably don't want it to. It is 'rationally ignorant' of the objective validity of patents, in economics lingo, because it is too costly for the PTO to discover those facts.").

31. In general terms they are fairly obvious. Claims directed to inventions that should not have been patented will occasionally impose costs on competitors and will usually impose opportunity cost losses on the patentees who have secured invalid patents. Failing to grant patents to deserving inventions diminishes the incentive to commercialize important innovations and discourages future research efforts.

requirements for patenting.[32] Those incentives have recently been laid bare by Professor R. Polk Wagner, whose recent work "Understanding Patent Quality Mechanisms" explains why patentees have very strong incentives to draft patent applications that obscure the scope of the claims they contain, why the Patent Office has strong incentives to effectively cooperate with this patenting strategy by conducting ineffective examinations, and why these behaviors are largely self-reinforcing.[33]

Patentees are inspired to obscure the scope of claims and the relationship of claims to prior art (which may be limiting or invalidating) for some very straightforward reasons.[34] Patent prosecution (the process of patent acquisition) normally takes years, and suits involving patents may happen years after a patent issues. Patent applicants must therefore seek to predict the future, to predict among other things the forms of embodiments competitors seeking to avoid infringement might someday use to practice the principles of an invention. In seeking to account for this eventuality, however, patent applicants must still seek to avoid the impact of prior art.

One well-recognized way of addressing the problem—of being broad enough to capture future developments, while narrow enough to avoid prior art—is to seek interpretive flexibility. If it can be achieved, it may allow a patentee to suggest a narrow understanding of its claims at the Patent Office and later adjust its arguments about claim meaning to meet competitors' products or services. Perhaps the most obvious way to achieve interpretive flexibility is to seek vagueness when claiming and describing an invention. The use of vague claims increases flexibility because vagueness can enable various arguments for the meaning of claim terms—arguments that might be precluded if claims are drafted to be clear and definite. Avoiding detailed descriptions of embodiments complements this

32. *See* R. Polk Wagner, *Understanding Patent Quality Mechanisms*, 157 U. PA. L. REV. 2135, 2138 (2008) (defining low-quality patents as those directed to inventions that do not meet "the statutory standards for patentability—most importantly, to be novel, nonobvious, and clearly and sufficiently described").

33. *See id.* at 2145–58; *see also* Kelly Casey Mullally, *Legal (Un)Certainty, Legal Process, and Patent Law*, 43 LOYOLA L.A. L. REV. 1109, 1135–42 (2010) (describing additional incentives affecting private actors that encourage patent claims of uncertain scope).

34. *See* Wagner, *supra* note 32, at 2148–51 (discussing the reasons).

approach by diminishing the power of courts to use the descriptive part of the patent document to limit the legal scope of patent claims.

It is important to point out that these behaviors are entirely rational to patent applicants. Indeed, it is somewhat hard to fault applicants who approach the patent-granting process with this perspective. A patent claim that can be valuably enforced against a competitor is a rare thing: patents provide probabilistic rights, and the probabilities that have to be overcome to obtain the valuable enforcement of a patent seem to increase with regularity.[35] Not only must a patentee actually have the necessary patents at the right time, it must also get a court to buy into a proffered claim construction and avoid the many theories available to invalidate a patent claim or make the patent unenforceable; if it successfully overcomes those hurdles, it must succeed in obtaining a remedy that justifies the acquisition and enforcement of the patent.[36]

When patentee incentives are combined with Patent Office incentives that encourage collaboration in the strategy of using vague claims and vague descriptions,[37] the patent-granting process imposes remarkable information costs on the patent system.[38] While patentability is difficult enough to measure, its measurement

35. *See* Mullally, *supra* note 33, at 1130–33 (describing recent Supreme Court caselaw that has enhanced the uncertainty of patent law).

36. *See* eBay, Inc. v. MercExchange, L.L.C., 547 U.S. 388 (2006) (creating uncertainty in the remedy available when patents are infringed and not invalid).

37. The incentives come from several different sources. As noted earlier, the patent-granting process is in practice unlikely to turn out good, clean, likely-to-be-valid patents. It is just a rough first cut. In addition, as has been chronicled by a number of commentators, the Patent Office has very limited resources yet faces a seemingly ever-increasing number of patent applications. The result is a number of pending applications that dwarfs the number of new applications each year, and reports suggest that examiners have a discouragingly low number of hours to spend with the mean patent application. Nonetheless, grants increase. In addition, the Patent Office exists to grant at least some number of patents and may have cultural incentives to regularly grant patents. From a more austere perspective, examiners are economically encouraged to allow patents because they are evaluated on production counts, which can be obtained by allowing patents to issue. *See, e.g.*, Wagner, *supra* note 32, at 2151–52 (describing these and other incentives).

38. Lee Petherbridge, *Positive Examination*, 46 IDEA 172, 181–84 (2005) (discussing information costs around patent prosecution); John R. Thomas, *Collusion and Collective Action in the Patent System: A Proposal for Patent Bounties*, 2001 U. ILL. L. REV. 305, 312–17 (explaining that information may affect Patent Office work product); R. Polk Wagner, *Reconsidering Estoppel: Patent Administration and the Failure of* Festo, 151 U. PA. L. REV. 159 (2002) (discussing prosecution externalities). For a theoretical treatment of information costs and intellectual property, including patents, see Clarisa Long, *Information Costs in Patent and Copyright*, 90 VA. L. REV. 465 (2004).

becomes even harder—approaching complete spuriousness—when the measurer cannot comprehend the claim of invention being measured. Moreover, the information costs imposed on the patent system by this set of incentives spill well beyond the patent-granting process. Competitors and patentees both will have difficulty assessing the scope and enforceability of claims in granted patents. Uncertainty of this sort can make business decisions involving patents more costly and can encourage litigation that may be unnecessary. In view of the way that the patent system is believed to provide much of its benefit—through incentives that rely on the principle that decent public notice of an invention and its attendant rights are important—the information costs imposed by the patent-granting process are troubling.

In sum, the theoretical framework of the patent-granting process deployed in this Article includes four central ideas: First, relatively few patents are commercially relevant. Second, the Patent Office issues nontrivial numbers of patents that it should not because the claims of the patents are not likely to satisfy one or more of the substantive requirements for patenting. Errors of this sort, or the reverse, (i.e., refusing to issue patents for deserving claims), impose costs that can reduce the efficiency of innovation and competition. Third, patent applicants have significant incentives to be vague in claiming and describing inventions. Fourth, the Patent Office has strong incentives to collaborate with applicants' vagueness-seeking strategies. The end result is that cooperatively patent applicants and the Patent Office can discourage good public notice of patent rights, and thereby impose significant information costs on the patent system.

III. THE FEDERAL CIRCUIT HAS MOVED TO RATIONALIZE PATENT LAW WITH PATENT POLICY AND THEORY

Relying on two central areas of patent law, this part develops the explanation for how the Federal Circuit has moved to rationalize patent law with patent policy and theory. The central areas of patent law that serve as the basis for this discussion are the doctrinal areas of patentability and patent scope. The central theme of this part is that the Federal Circuit's work in these important areas of the law

can be understood[39] as respecting basic policies and theories of patent law, as accounting for well-recognized limitations of PTO practice, and in at least some cases as leaving the law in a position to continue to develop in response to a changing technological future.

A. The Federal Circuit and Patentability

This section introduces patentability—the law of obviousness. After introducing the basic principles of the law, it points out that Justice Woodbury's prediction over 150 years ago that the law "seems open to great looseness or uncertainty in practice"[40] has largely been validated. After considering some reasons for why the principle underlying obviousness might defy rules that hope to substantially enhance its legal determinateness, this section introduces a development in the law of obviousness normally associated with the involvement of the Federal Circuit. It proceeds to explain how this development rationalizes the law by: (a) helping to impose obviousness policy; (b) promoting accuracy and certainty, and respecting measurement cost concerns; and (c) potentially working as an incubator for improvements to the law—particularly improvements that might increase determinateness.

Patent law establishes a number of substantive requirements that must be satisfied for a patent to issue. For example, an invention must be the kind of thing that can be patented (i.e., it has to be patentable subject matter),[41] it must also be useful,[42] be properly disclosed in the patent specification,[43] be new[44] in the sense that it has not been previously possessed by the public, and be nonobvious.[45]

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39. The caveat implied here is, I think, fairly obvious. This part seeks to show that what the court has done can be understood—in view of the framing provided—as a rational response to a number of generally agreed upon features of the modern patent system. It makes no claim that the Federal Circuit's performance has been "perfect" or that it has "optimized" the incentives and disincentives that the rule choices provide. Nor does it endeavor to confront how the explanations might change if the framing were to change—if, for example, extrinsic empirical assumptions or information were brought to bear.

40. Hotchkiss v. Greenwood, 52 U.S. (11 How.) 248, 270 (1850) (Woodbury, J., dissenting).

41. *See* 35 U.S.C. §§ 101–102, 103(a), 112 (2006). *See generally* Diamond v. Chakrabarty, 447 U.S. 303 (1980) (holding a live human-made microorganism is patentable subject matter); *In re* Bilski 545 F.3d 943 (Fed. Cir. 2009), *cert. granted sub nom.* Bilski v. Doll, 129 S. Ct. 2735 (2009) (holding a method of hedging risk in the field of commodities trading is not patentable subject matter).

42. *See* 35 U.S.C. § 101.

43. *Id.* § 112.

While all of these requirements are necessary to have a valid and enforceable patent, the common refrain is that nonobviousness is the "ultimate condition of patentability."[46] The other main prior art limitations—novelty and the statutory bars—seek to assess whether a single piece of prior art, such as a scientific article, or a prior patent, discloses either expressly or inherently an invention identical to the one sought by a patent applicant. While the novelty and statutory bar provisions are not always easy to apply, they are understood to present questions that can often be reasonably determined.

In contrast to the novelty and statutory bar provisions, the basic policy of obviousness is that advances not apparent to an ordinarily skilled artisan—armed with all manner of relevant prior art—are those that advance human understanding sufficiently to justify the grant of a patent. Thus, even truly novel inventions will be denied a patent if they are deemed to have been within the reach of a person of ordinary skill in the art. The relevant goal of this policy, stated in terms of patent theory, is to set the level of innovation at a place where the costs and benefits—the incentives—thought to flow from the granting of patents are well aligned.[47]

1. The Limitations of Obviousness

As noted above, the basic policy of obviousness is that advances not apparent to an ordinarily skilled artisan are those that advance human understanding sufficiently to justify the grant of a patent. While the concept is simple enough to state, it has proven tremendously difficult to operationalize. Nearly one hundred years after *Hotchkiss v. Greenwood*, the case usually credited with introducing the doctrine,[48] Judge Learned Hand, a noted patent jurist,

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44. *See id.* § 102 (establishing the novelty and statutory bars).

45. *See id.* § 103(a) (making an invention unpatentable "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 at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains").

46. *See, e.g.*, NONOBVIOUSNESS—THE ULTIMATE CONDITION OF PATENTABILITY (John F. Witherspoon ed., 1980).

47. *See, e.g.*, Robert Merges, *Uncertainty and Patentability*, 7 HIGH TECH. L.J. 1 (1992) (describing how the obviousness standard helps measure risk taking in innovation).

48. The Supreme Court claims to have invented the now-statutory standard in *Hotchkiss v. Greenwood*, 52 U.S. (11 How.) 248, 248–49, 253–54 (1850). *See* Graham v. John Deere Co. of Kan. City, 383 U.S. 1, 4 (1966) ("We have concluded that the 1952 Act was intended to codify

described the doctrine as being "as fugitive, impalpable, wayward, and vague a phantom as exists in the whole paraphernalia of legal concepts."[49] And eventually, as the Supreme Court continued to struggle to provide an operationally useful definition of the concept, Congress interrupted roughly one hundred years of judicial effort by codifying the requirement for the first time in the 1952 Patent Act, which makes an invention unpatentable if it was "obvious at the time [it] was made to a person having ordinary skill in the art to which said subject matter pertains."[50]

In terms of legal determinateness,[51] the law of obviousness has not advanced too far beyond its basic concept, which is largely stated by the statute.[52] There are several probable reasons for this. The first—and maybe most pronounced—is the nature of the question itself. The measurement cost of obviousness is tremendous.[53] Recall that the policy of obviousness is that patents should be granted for

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judicial precedents embracing the principle long ago announced by this Court in *Hotchkiss v. Greenwood*, 11 How. 248 (1851), and that, while the clear language of section 103 places emphasis on an inquiry into obviousness, the general level of innovation necessary to sustain patentability remains the same."); *id.* at 12 (stating that *Hotchkiss* "required a comparison between the subject matter of the patent, or patent application, and the background skill of the calling"); *id.* at 19 (emphasizing "that we find no change in the general strictness with which the overall test is to be applied").

The temporal distance from *Hotchkiss v. Greenwood*, 52 U.S. (11 How.) 248 (1850), to *Harries v. Air King Prods. Co.*, 183 F.2d 158 (2d. Cir. 1950), is the basis for the statement "Nearly one hundred years."

49. *Harries*, 183 F.2d at 158.

50. *See* 35 U.S.C. § 103(a).

51. By which I mean the capacity of the rules of the law when confronted with a claim to a new invention to conclusively settle patentability—without the need to resort to a costly inquiry into easily disputable factual conclusions. For a comprehensive discussion of legal uncertainty with specific attention to patent law, see Mullally, *supra* note 33.

52. Which is not to say that it has not advanced at all. The most notable development is probably the TSM principle, which is the focus of this section. The Federal Circuit is also credited with trying to develop the use of the secondary considerations—sometimes called objective indicia of nonobviousness—introduced in *Graham*, as well as the requirement that there must be a nexus between the claimed invention and the application of secondary considerations. Another example would be the development of rules that allow for the use of secret prior art in obviousness analyses. There are surely others, rules that can in some cases help provide some legal clarity to how an obviousness analysis will determine, but the important point here is that there are not many, and certainly not many with specific effect. For example, there is not a rule yet that says knowledge of the primary amino acid structure of a protein makes the sequence of the genomic DNA encoding that protein obvious or nonobvious; nor is there a rule that determines whether knowledge of the sequence of, for example, a fruit fly gene encoding fibroblast growth factor receptor makes human homologues obvious or nonobvious.

53. *See* Long, *supra* note 38, at 476–80.

those inventions that present a sufficiently large advance over the prior art (and not granted otherwise). Consider for a moment what that entails for decision makers—patent examiners, competitors and their lawyers, courts, or members of the public—faced with the question of whether a new invention is nonobvious. A decision maker must discover and comprehend the attributes of the invention defined by the claims of a patent (or patent application). The decision maker must then discover and comprehend the attributes that comprise the prior art. Then, it must then compare the attributes comprising the invention with the attributes comprising the prior art and find a means of comprehending the differences. The decision to grant or not to grant a patent is determined by a judgment of whether the differences between the invention and the prior art are big enough; a quantum not defined in patent law beyond the idea that a person having ordinary skill in the art knows what it is. As one commentator has remarked: "It is hard to think of a higher measurement-cost margin than this."[54]

A second reason—and a reason that partially responds to the question of why patent law does not have more rules that can reduce the measurement cost of obviousness—is that the subject matter of patent law includes a tremendous variety of complex things, things existing in a wide variety of technological and market contexts, and things existing at the very edge of human knowledge for which attribute-describing vocabularies are often less developed. One consequence of this is that there is often genuine disagreement over whether a new invention represents a big enough advance over the prior art to justify a patent.

A third reason the law may not have taken on more determinateness stems from a basic purpose of patent law: to encourage the creation, disclosure, and use of inventions. Specific

54. *Id.* at 480. Appreciating that the task of determining patentability is so informationally expensive also suggests that we should be very cautious in presuming that the Patent Office is always able to perform a quality analysis of patentability. The Office is often described as overwhelmed with patent applications and the mean time examiners are reported as spending with each application is sobering. Along these lines, Scott Kieff has recently argued that we should not expect the Patent Office to always find all of the relevant prior art. Scott Kieff, *The Case for Preferring Patent-Validity Litigation over Second-Window Review and Gold-Plated Patents: When One Size Doesn't Fit All, How Could Two Do the Trick?*, 157 U. PA. L. REV. 1937 (2009) (arguing that there is both secret and nonsecret prior art that can be well beyond the resources of the Patent Office).

rules banishing large amounts of subject matter from patentability could be expected to have the general impact of discouraging the creation, disclosure, and use of inventions directed to the subject matter and encouraging the redeployment of resources to enterprises that permit greater reward. Thus, not only is the obviousness determination hard to get correct, getting it broadly wrong may have serious consequences for national industrial policy.[55] In view of this risk, the most straightforward prophylactic might be to deemphasize broad rules prohibiting patentability in favor of a case-by-case assessment of new inventions.

A fourth reason is that there may be little need for rules that determine obviousness with great specificity. For patents that matter, the system might well be able to await litigation.[56] By recent estimates there are roughly 1.8 million in-force U.S. patents,[57] only a very small fraction of which are thought to have any economic significance whatsoever.[58] Of that fraction, only a fraction produce disputes between firms, and even fewer—roughly three thousand

55. A number of commentators have suggested that the courts should use nonobviousness to banish some biotechnological subject matter from patentability. *See, e.g.*, Dan L. Burk & Mark A. Lemley, *Biotechnology's Uncertainty Principle*, 54 CASE. W. RES. L. REV. 691 (2004) (biotech and software); Sapna Kumar & Arti Rai, *Synthetic Biology: The Intellectual Property Puzzle*, 85 TEX. L. REV. 1745 (2007) (DNA-based claims); Lee Petherbridge, *Intelligent TRIPS Implementation: A Strategy for Countries on the Cusp of Development*, 25 U. PA. J. INT'L ECON. L. 1133 (2004) (biotech). None of the commentators, as far as I can ascertain, present this hypothetical, but consider as an example a rule that knowledge in the art of a partial sequence of cDNA with a suspected function makes obvious later claims to genomic DNAs and cDNAs with similar sequences from all species, as well as the chemical structures of the corresponding gene products in different species. A rule this broad, while someday perhaps reflecting the state of the art of molecular biology, would probably have been badly inaccurate if applied woodenly across the first quarter century of art. The more likely reality is that analogs or homologs and their corresponding gene products sometimes would have been obvious and sometimes not, with perhaps a general increase in probability of obviousness as the years have gone by. Had a rule of no patentability been imposed, say in 1985, the rule should have been expected to somewhat discourage the pursuit of some valuable analogs and homologs, to diminish investment in firms engaged in applying molecular technologies to human problems (e.g., firms pursuing gene therapies or agricultural improvements), and, thereby, to likely put off the time when moving from model organisms to humans through the prediction, identification, and cloning of analogs and homologs becomes regularized.

56. *But cf.* Graham v. John Deere Co. of Kan. City, 383 U.S. 1, 19 (addressing obviousness and stating, "To await litigation is—for all practical purposes—to debilitate the patent system.").

57. WORLD INTELLECTUAL PROP. ORG., WORLD PATENT REPORT: A STATISTICAL REVIEW 23 (2008), *available at* http://www.wipo.int/export/sites/www/ipstats/en/statistics/patents/pdf/wipo_pub_931.pdf (reporting the number of U.S. patents in force in 2006).

58. *See generally* Lemley, *supra* note 30 (arguing that most patents are economically unimportant); *infra* note 74.

patents per year in recent years—make it into a complaint.[59] Of the patents that make it into a complaint, only a fraction are subject to a judicial decision on the merits (a recent "high"-side estimate places the number at between 86 and 125 patents per year that go to court).[60] Fewer patents still are involved in appeals from judicial decisions on the merits.

Finally, of course, patentability requires an assessment of what a person having ordinary skill in the art would think about the question. Channeling the question through hypothetical individuals imagined to be in possession of the ordinary skill of the calling invites competing narratives from parties over what such a person would know, what such a person would think to try when faced with a problem known in the art, and what expectations such a person would have for such efforts.

Taken together, the concerns listed above may go far toward explaining why the law of patentability remains fairly general and is mostly devoid of rules capable of conclusively determining the question without resort to factual information normally susceptible to genuine dispute between competing parties.

2. How the Federal Circuit Helped Rationalize Obviousness

The history of the obviousness doctrine is a long one,[61] and observers typically conclude that the Federal Circuit has made more than one contribution to the doctrine. Of all the contributions the court is credited[62] with making, however, perhaps none is more controversial than the requirement that a determination by the Patent Office[63] or by a trial court that a patent claim is obvious be

59. Dennis Crouch, *Patent Litigation Statistics: Numbers of Patents Being Litigated*, PATENTLY-O, Mar. 17, 2008, http://www.patentlyo.com/patent/2008/03/patent-litigati.html. Professor Wagner reports that over roughly the last twenty years, there have been between approximately 1.4 and 2.4 patent-infringement suits filed per one thousand in-force patents. Wagner, *supra* note 32, at 2143 fig.1 (2009).

60. *See* Lemley, *supra* note 30, at 1501 & nn. 26–27 (giving a high-side estimate of 0.2 percent of all issued patents, or between 86 and 125 patents per year).

61. *See* Hotchkiss v. Greenwood, 52 U.S. (11 How.) 248 (1850) (definitively establishing the requirement).

62. The doctrine about to be introduced did not, strictly speaking, originate with the Federal Circuit. The court is, however, credited with (and in some circles accused of) developing it and amplifying its significance.

accompanied by a rationale explaining how the decision maker arrived at its conclusion. In other words, the Federal Circuit began to insist that a decision maker explain *why* a person having ordinary skill in the art would find a patent claim to be obvious.

The Federal Circuit also established an analytical framework that furnished a vocabulary for articulating evidentiary and analytic findings concerning obviousness rationales. In a number of cases, the court set out that a patent claim may be proven obvious by a showing that at the time the invention was made, the nature of the problem to be solved, the knowledge of an ordinarily skilled artisan, or the actual prior art references would have suggested or taught the claimed invention to a person having ordinary skill in the art.

This requirement has come to be known as the teaching, suggestion, or motivation (TSM) test,[64] and in recent years, the principle of TSM has received the imprimatur[65] of the Supreme Court.[66] I explain below that the development of the TSM principle

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63. *See, e.g.*, William DeVaul & Philip C. Swain, *Appeals from the Patent and Trademark Office (PTO) and District Courts in Patent Cases*, *in* THE UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT: A HISTORY 1990–2002 253, 283 (1991) ("The BPAI cannot rely on conclusory statements when dealing with particular combinations of prior art and specific claims, but must set forth the rationale on which it relies, particularly if that rationale comes from general knowledge that negates patentability.").

64. *See, e.g.*, KSR Int'l Co. v. Teleflex Inc. 550 U.S. 398 (2007) (using this acronym).

65. For language remarkably similar to the analytical framework developed by the Federal Circuit, see *id.* at 418:

> Often, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.

The Court also confirmed the Federal Circuit's doctrinal requirement that a decision maker explain why a person having ordinary skill in the art would find a particular claim to be obvious, *id.* ("To facilitate review, this analysis should be made explicit."), and citing with approval *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) ("[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness."). For additional language confirming that obviousness can be shown by information about the nature of the problem to be solved, see *id.* at 419–20. ("One of the ways in which a patent's subject matter can be proved obvious is by noting that there existed at the time of invention a known problem for which there was an obvious solution encompassed by the patent's claims.").

66. It is worth pointing out that while the Court did approve the principle of TSM in *KSR International*, it also disapproved of the Federal Circuit's "application of the TSM test" in the case. *Id.* at 419–20. *Accord* Mullally, *supra* note 33, at 1132 (noting that in *KSR* the Supreme Court "overturned" the Federal Circuit's decision "applying" TSM because the court had applied TSM "too rigidly"); Rebecca S. Eisenberg, *The Supreme Court and the Federal Circuit: Visitation*

presents a nice example of how the Federal Circuit made patent law more rational.

At the outset, however, it is important to point out that the central observation of this section is that the Federal Circuit's development of the TSM principle was a sensible and useful innovation, one that improves the logical connection between patent law and patent policy and theory. That position does not exclude the notion that TSM is vulnerable to criticism on some grounds.[67] Generally speaking, rule choices in patent law adjust benefit and cost possibilities that affect innovation. To the extent TSM provided benefits, it presumably also imposed costs.

The three subsections that follow describe (a) how the TSM principle can be understood as a tool useful for imposing obviousness policy; (b) how TSM addresses error costs by promoting accuracy and certainty, and by respecting measurement cost concerns; and (c) how TSM might work as an incubator for improvements to the law—particularly improvements that might increase determinateness.

a. Imposing patent policy

The first important quality of TSM is that it can be understood as a tool useful for imposing patent policy. To be explicit, this understanding acknowledges that the dominant policy of obviousness

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and Custody of Patent Law, 106 MICH. L. REV. FIRST IMPRESSIONS 28, 32 (2007), http://www.michiganlawreview.org/firstimpressions/vol106/eisenberg.pdf (noting that after *KSR*: "The Federal Circuit continued to cite its own prior nonobviousness decisions liberally, including pre-KSR decisions applying the TSM test"). *But see* John F. Duffy, KSR v. Teleflex: *Predictable Reform of Patent Substance and Procedure in the Judiciary*, 106 MICH. L. REV. FIRST IMPRESSIONS 34, 36 (2007), http://www.michiganlawreview.org/assets/fi/106/duffy.pdf, (claiming that in writing *KSR* the Supreme Court was "disavowing years of lower court precedent").

In addition, this Article makes no claim about the impact of the *KSR* opinion on Federal Circuit or district court behavior. For those interested in knowing more about how *KSR* may have impacted courts, see Ali Mojibi, *An Empirical Study of the Effect of* KSR v. Teleflex *on the Federal Circuit's Patent Validity Jurisprudence*, 20 ALB. L.J. SCI. & TECH. (forthcoming 2010) (draft on file with author) (reporting an empirical study on Federal Circuit and district court behavior toward obviousness and anticipation, and arguing that *KSR* and the Supreme Court's opinion in the case impacted Federal Circuit and district court behavior notwithstanding the text of the Court's opinion, and in instances not involving claims of obviousness).

67. It has, in fact, been subjected to much criticism. Some is collected in Lee Petherbridge & R. Polk Wagner, *The Federal Circuit and Patentability: An Empirical Assessment of the Law of Obviousness*, 85 TEX. L. REV. 2051, 2091 nn.69–71 (2007).

is that inventions not obvious to a "person having ordinary skill in the art at the time the invention was made" are those that should be patentable because that standard represents the proper measure of technological advance sufficient to warrant a patent.[68] Thus, the implementation of obviousness policy hinges on what a person having ordinary skill in the art would think about the differences between the prior art and the claimed invention; and more specifically on whether a person of skill in the art would find those differences small enough that the patent claim when made would have been obvious or apparent.

TSM connects the doctrine to this policy because it focuses the decision maker on the policy inquiry. TSM asks for an explanation why, in view of the nature of the problem to be solved, the knowledge of an ordinarily skilled artisan, and the actual prior art references, the invention would have been taught or suggested to an ordinarily skilled artisan. It seeks, therefore, to ask whether the claimed invention was within the grasp of the art; where it would have been—where an artisan would understand the differences to be small enough that the claimed invention could be made—the claim is obvious, and where it would not have been—where the artisan would not have an approach that could reasonably be expected to succeed—the claim is nonobvious.

b. Responding to error and measurement costs

One benefit of seeking to make obviousness doctrine responsive to obviousness policy is that the law might more effectively set the level of innovation at a place where the costs and benefits flowing from the granting of patents are well aligned. This goal, of course, requires that the law be able to somewhat accurately differentiate between patentable and unpatentable claims. TSM endeavors to respond to this concern by at least two mechanisms: promoting accuracy in decision making and promoting procedural certainty.

68. This is what the statute calls for and is probably well accepted. But while it is rare to learn of new proposals for obviousness standards, they occasionally come along. *See generally* Merges, *supra* note 47 (discussing economic nonobviousness); Dan L. Burk & Mark A. Lemley, *Biotechnology's Uncertainty Principle*, 54 CASE W. RES. L. REV. 691, 716 (2004) (arguing for different standards for different subject matter).

When it established TSM, the Federal Circuit developed an objective analysis, one employing objective inputs and transparent decision making and, accordingly, one susceptible to effective judicial review. This structure should be expected to promote accuracy in decision making. The range of prior art available for the analysis is very broad.[69] Not only does it include effectively any relevant art defined by 35 U.S.C. § 102—including the secret prior art categories—it also includes the full breadth of knowledge of a person of ordinary skill in the art as well as information about how such a person would be inspired to use his or her skills in view of known problems in the relevant art. After encouraging a search of the evidence for this information, the framework (usually) requires that a decision maker then craft an argument explaining why the claimed arrangement of elements would have been apparent to a person having ordinary skill in the art at the time the invention was made. This approach discourages decisions based on unarticulated shadow rationales and discourages the kind of analytical corner cutting that can lead to error.

TSM also promotes procedural certainty. As used here, procedural certainty refers to the idea that there is a social benefit to be had when a legal decision can be relied on as likely to be conclusive. Because of the factual, objective nature of the inquiry, TSM should be expected to encourage the belief that parties were afforded a fair hearing on their claims.[70] This is not to say that in every instance observers will agree with the decision maker's conclusion when TSM is used. Nonetheless, the quality and nature of TSM analysis can diminish the sense that a decision was arbitrary or ill considered, and thereby encourage confidence in the correctness of the application of law.

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69. *See* Petherbridge & Wagner, *supra* note 67.

70. Empirical evidence about the rate at which the Federal Circuit affirms lower-court decisions using TSM on obviousness is currently underdeveloped and therefore not conclusive regarding this idea. *See id.* (reporting a cumulative result for a fifteen-year period (1990–2005) that the Federal Circuit affirmed obviousness decisions when it used TSM (65.3 percent) at nearly the same rate it affirmed obviousness analyses that did not use TSM (65.0 percent)). The same study, however, provides additional evidence relevant to certainty. In analyses evincing the application of TSM, the Federal Circuit's decision failed to dispose of the question of whether the claim at issue was obvious only 13.4 percent of the time. *Id.*

Compared with an analytic regime that does not require a decision maker to articulate a rationale, TSM seems to represent a modest increase in practical measurement cost, primarily because it requires a more express examination of the knowledge of the art. This is not necessarily troubling because any increase in measurement cost should be balanced against whatever efficiency gains are achieved by improving the accuracy and finality of obviousness determinations. However, increases in measurement cost might decrease accuracy in contexts in which heightened costs discourage a decision maker from spending the resources necessary to reach an accurate decision. This last concern is, perhaps, amplified by the fact that in theoretical terms, the measurement cost of the obviousness determination is quite high[71] to begin with.

A partial response to the concern that the theoretical cost of measurement is high is that courts and decision makers, even ones that employ TSM, are unlikely to assume the theoretically demanded cost of analysis. From this vantage, TSM can be understood as not so much (or at least not "just") increasing the cost of measurement, but as adjusting the cost of measurement. Some costs will increase—particularly as they relate to a more searching examination of evidence and the reporting of conclusions that are drawn from it. But TSM might also push down some other decisional costs.

To some extent, TSM compensates for increases in measurement cost by furnishing an analytical framework that works to reduce the cost of arguing that claims are obvious and works to reduce the cost of presenting decisions that claims are obvious. In developing TSM, the court set out that a patent claim may be proven obvious by a showing that at the time the invention was made, the nature of the problem to be solved, the knowledge of an ordinarily skilled artisan, and the actual prior art references would have suggested or taught the claimed invention to a person having ordinary skill in the art. This development established a vocabulary for articulating evidentiary and analytic findings concerning obviousness. By furnishing a vocabulary and analytical structure useful for deploying the knowledge and skill of the ordinary artisan, TSM legitimates arguments concerning patentability that might have

71. *See supra* Part III.A.1.

been of questionable validity absent the doctrine. Put slightly differently, TSM represents a perhaps unprecedented advance in how, generally, to establish obviousness. TSM is the roadmap to unpatentability.[72] In this respect, this role of TSM may be particularly significant when it comes to the Patent Office. TSM creates means by which the Patent Office and Federal Circuit can communicate in the review of Patent Office rejections.[73]

The instances in which TSM might increase the cost of decisions may not matter much.[74] For patents that matter, resolution through post-issue litigation may be a suitable (and to some, even an ideal) alternative. The basic insight is that the "innovations that are worth fighting for sort themselves out over time and [can be] vetted by the institution best able to make an ex post determination regarding patent value and scope: the courts."[75] Because so few patents are ever asserted against a competitor, even if TSM creates an increase in measurement cost, it is borne by courts in cases in which—as a policy matter—society might especially care how a person of ordinary skill in the art understands the invention, the art, and the magnitude of the differences between the two. Thus, in the case of litigation, to the extent TSM does increase the cost of assessing

72. To supplement the logical force of this argument, empirical studies indicate that TSM encourages determinations of invalidity. *See* Petherbridge & Wagner, *supra* note 67, at 2094 (reporting a significant downward trend in nonobviousness outcomes in Federal Circuit analyses that use TSM); *see also* Christopher A. Cotropia, *Nonobviousness and the Federal Circuit: An Empirical Analysis of Recent Case Law*, 82 NOTRE DAME L. REV. 911, 953 (2007) (reporting a three-year study spanning 2002–2005 that finds TSM defeating a finding of obviousness in just 24.5 percent of patents appealed from patent infringement cases).

73. *See* Petherbridge & Wagner, *supra* note 67, at 2086 (reporting a significant decrease in the reversal rate of PTO obviousness decisions between 1990 and 2005, a period during which the use of TSM by the Federal Circuit increased significantly); *see also* Cotropia, *supra* note 72, at 953 (reporting a three-year study spanning 2002–2005 that finds TSM defeating a finding of obviousness in just 9.26 percent of patent applications appealed from the Patent Office).

74. This basic idea finds support in the numbers of patents litigated, set forth above in Part III.A.1. For work supporting or relying on this idea see Lemley, *supra* note 30, at 1497 ("Because so few patents are ever asserted against a competitor, it is much cheaper for society to make detailed validity determinations in those few cases than to invest in additional resources examining patents that will never be heard from again."); Kieff, *supra* note 54 (arguing that litigation provides the means to address concerns about low-quality patents); and Dan L. Burk & Mark A. Lemley, *Fence Posts or Sign Posts?: Rethinking Patent Claim Construction*, 157 U. PA. L. REV. 1743, 1782 (2009) ("[I]t is inconceivable that we would want to invest the resources necessary to fully vet every patent application for validity."). *See also* DAN L. BURK & MARK A. LEMLEY, THE PATENT CRISIS AND HOW THE COURTS CAN SOLVE IT 95 (2009) (arguing that the courts are the correct institutions for patentability analysis).

75. Burk & Lemley, *supra* note 74, at 1782.

obviousness, it may do so in situations in which the costs of the determination are most likely to be justified.

For claims in patent applications, it is hard to imagine that TSM can so adjust the costs of patent examination that it will have much detrimental impact on the quality of patents issuing from the Patent Office.[76] In those few cases in which it might, the probability that the patent claims issued (the fraction that are actually obvious) will have any significant economic impact is predicted by the theory described above[77] to be very low. Moreover, in the rare instance in which such claims take on significant economic importance, they should often serve as nuclei for litigation. In that context, the viability of legal claims involving the patent claims should often become apparent, and pressing the enforcement of clearly invalid claims carries its own set of risks to patentees.

c. The TSM principle and the future of obviousness

Empirical work suggests that over time the Federal Circuit used TSM to broaden the use of information in patentability analyses.[78] If so, it suggests that TSM may work as an incubator for nurturing new approaches to patentability.[79]

The Supreme Court has prescribed a framework for analyzing obviousness in which the ultimate conclusion regarding a claim's obviousness is a legal question sitting atop a highly fact-intensive analysis.[80] The development of TSM is remarkably consistent with the prescribed framework, and if anything, the preliminary impact of the Federal Circuit's emphasis on TSM might have been to amplify the influence of the factual component of the obviousness analysis. Whether an invention would have been taught or suggested to a person of ordinary skill in the relevant art at the time the invention was made, given the nature of the problem to be solved, the knowledge of the ordinarily skilled artisan, and in view of the relevant prior art references is, from the perspective of judicial

76. *See supra* note 37.

77. *See supra* Parts II.B, III.A.1; note 74.

78. *See* Petherbridge & Wagner, *supra* note 67, at 2095–96 fig.8 (indicating that the Federal Circuit is teaching the broad use of prior art information in patentability analyses).

79. To be clear, the thoughts that follow are speculative.

80. *See* Graham v. John Deere Co. of Kan. City, 383 U.S. 1, 4 (1966).

review, a question of fact.[81] The consequence of this is that the legal part of the obviousness question is very thin. The cases tend to turn heavily on the evidence and the factual conclusions they support.

As TSM begins to mature as part of the jurisprudence, however, it might have an unappreciated future benefit: it might encourage the future development of the legal part of the obviousness question. In other words, the widespread use of TSM might, eventually, lead to a thickening of the legal part of the obviousness question and thereby might move the law to a greater level of determinateness. Structurally, TSM disciplines the obviousness analysis and encourages a searching analysis of relevant sources of information.[82] This feature should be expected to discourage decisions based on unarticulated rationales and should be expected to diminish the related incentive for decision makers to cut corners analytically. This disciplining focus is complemented by the TSM-developed vocabulary and analytic structure. That structure is useful for focusing argument development on what a person of skill in the art would try to do when faced with a problem and what expectations such a person might have for approaches to its solution. In time, it may become evident that certain kinds of arguments are more likely to be successful, and it may become clear that certain arguments reflect commonly held truths about innovation generally, or at least hold true for a particular area of innovation. Some arguments may evolve to the point that they begin to be understood as recognizing rules (or perhaps sub-rules) useful for limiting evidentiary requirements, reducing the range of genuine factual dispute, or deciding obviousness cases quickly and at a lower cost.[83]

The idea that cases provide a source of new ideas about the law is not, of course, unique to TSM. However, using TSM to (largely)

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81. *In re* Lee, 277 F.3d 1338, 1343 (Fed. Cir. 2002) ("When patentability turns on the question of obviousness, the search for and analysis of the prior art includes evidence relevant to the finding of whether there is a teaching, motivation, or suggestion to select and combine the references relied on as evidence of obviousness."); *see, e.g.*, McGinley v. Franklin Sports, Inc., 262 F.3d 1339, 1351–52, (Fed. Cir. 2001) ("[T]he central question is whether there is reason to combine [the] references," a question of fact drawing on the Graham factors.).

82. Christopher A. Cotropia, *Patent Law Viewed Through an Evidentiary Lens: The "Suggestion Test" as a Rule of Evidence*, 2006 BYU L. REV. 1517 (2006).

83. It is also possible that none of this might come to pass and that the lasting impact of the TSM principle might be the strong implication that the concept of obviousness is unavoidably heavily factual in nature.

define the competitive space in which new ideas about patentability are encouraged to develop has some advantages over a fully unconstrained competitive framework. Perhaps the central advantage is that TSM keeps the parties and decision makers focused on the central policy issue—would a person of skill in the art find the invention obvious at the time it was made. TSM also provides a flexible framework[84] and should have little problem accommodating diverse explanations for why a person of skill in the art would have been suggested or taught an invention in view of artisan knowledge and experience. Moreover, any sub-rules about the use of information relevant to the art or about the substantive interpretation of 35 U.S.C. § 103 that develop through the process might remain generally bounded by the ultimate approach prescribed by TSM. If resort can always be had to general TSM, then the resulting framework might hedge against the broad impact of any specific rules the court might announce because the court can always fall back to the TSM principle to adjust a new rule's application to context.

B. The Federal Circuit and Patent Scope

The purpose of this section is to explain how the Federal Circuit has rationalized patent law through its work with doctrines that affect patent scope. As was noted in the previous section, the Federal Circuit is not solely responsible for the developments attributed to it here. In both of the examples presented, the court was helped along and encouraged to proceed as it did by the Supreme Court, and it is also surely the case that the court was helped along its path by the arguments and advocacy of the parties that appeared before it. Even so, the court is conventionally credited (and by some criticized) for bringing the subject areas of law to their current state of development. The following subsections explain how developments

84. The empirical work in this area is uniform in pointing toward the conclusion that TSM represents a flexible approach that does not force determinations favoring patentability. Cotropia, *supra* note 72, at 914 ("[R]ecent criticism is not supported by the last four years of Federal Circuit case law."); Petherbridge & Wagner, *supra* note 67, at 2052 ("[T]he view that emerges is of a modern jurisprudence of obviousness that is . . . more flexible than has been heretofore understood."). It bears repeating that the Supreme Court's concern in *KSR International v. Teleflex*, 550 U.S. 398 (2007), was not with TSM generally but was instead with a specific example of its application, one that the court felt was too rigid.

in doctrines surrounding the doctrine of equivalents and claim construction can be understood as part of a cohesive (if not yet perfected) effort to rationalize patent law with patent policy and theory. A central theme has been public notice, suggesting that the court's focus has been on improving the efficiency of innovation and competition where patents are implicated. The targets of doctrinal developments have been information externalities that affect not only the patent-granting process but also post-grant transactions around patents.

1. The Death of the Doctrine of Equivalents

When an accused device or process falls within the textual scope of a patent claim, it is said to *literally* infringe. In cases in which literal infringement does not lie, however, patentees are generally entitled to argue that the accused device or process infringes under the doctrine of equivalents. The doctrine of equivalents expands a patentee's exclusive rights beyond the subject matter defined by the patent's claims—beyond the textual definition provided by the patent document—by imposing infringement liability where an accused product or process is only insubstantially different from the claimed invention.[85]

Created by judges many years ago,[86] the doctrine of equivalents responds to the policy concern that if competitors can escape infringement liability by practicing embodiments that represent insubstantial changes over those patented, potential innovators will be discouraged from disclosing new inventions, or even taking the risk of some types of innovation.[87] In this basic sense, the policy of the doctrine of equivalents is to protect the incentive structure of the patent system.

This venerable idea comes with a cost. Because it allows patentees to exclude others from subject matter beyond the textual scope of a patent claim, the doctrine of equivalents fosters uncertainty in competition. The reason is that public notice of the

85. It does not—at least as a formal matter—expand the scope of claims.

86. *See, e.g.*, Winans v. Demead, 56 U.S. 330 (1854).

87. Graver Tank v. Linde Air Prods. Co., 339 U.S. 605, 607 (1950) ("To permit imitation of a patented invention which does not copy every literal detail would be to convert the protection of the patent grant into a hollow and useless thing . . . leaving room for—indeed encouraging—the unscrupulous copyist to make unimportant and insubstantial changes.").

scope of rights conferred by a patent cannot be had by a full and thorough reading of a patent and its prosecution history.[88] The claimed invention has an uncertain penumbra, wherein a competitor's conduct can warrant liability—even though the conduct clearly falls outside a patentee's textual definition of the invention.

Reconciling these two competing values—protecting the patent system from the consequences of allowing the free practice of insubstantial changes and providing adequate public notice of the rights conferred by a patent—has been the challenge of the doctrine of equivalents. And many, I think, would agree that the Federal Circuit has at least sought to meet it.

How has the court responded to the challenge? Well, there seems to be good agreement that the Federal Circuit has largely done away[89] with the doctrine of equivalents. Perhaps more accurately, the court has made the doctrine's successful assertion by patentees the exception, not the rule, in patent infringement cases. There is some dispute as to how,[90] but both interpretive[91] and empirical[92] work point

88. Warner-Jenkinson Co. v. Hilton Davis Chem. Co., 520 U.S. 17, 29 (1997) ("There can be no denying that the doctrine of equivalents, when applied broadly, conflicts with the definitional and public-notice functions of the statutory claiming requirement.").

89. The doctrine of equivalents is one of those examples in which the Supreme Court has encouraged the developments that have led to the current state of the doctrine. Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 535 U.S. 722 (2002); *Warner-Jenkinson*, 520 U.S. 17. That is not to say that the Supreme Court has held that the doctrine of equivalents may be formally eliminated from the patent law. Quite the contrary, the Supreme Court has insisted that the doctrine of equivalents remain—even if only in a very disabled form—because to abolish the doctrine of equivalents would "risk destroying the legitimate expectations of inventors in their property." *Id.* at 739.

90. Some reports credit rule developments as responsible for killing the doctrine of equivalents. Charles W. Adams, *The Doctrine of Equivalents: Becoming a Derelict on the Waters of Patent Law*, 84 NEB. L. REV. 1113, 1156–57 (2006) (interpreting doctrinal rule developments as limiting the doctrine to the point that it has become obsolete). Others largely reject the notion that legal rules had much to do with the death of the doctrine and finger procedural developments as the culprit. *See* John R. Allison & Mark A. Lemley, *The (Unnoticed) Demise of the Doctrine of Equivalents*, 59 STAN. L. REV. 955, 976–79 (2007) (reporting the results of an empirical examination of appellate and trial opinions addressing the doctrine of equivalents). Another view still is that rules and procedure have cooperated to diminish the usefulness of the doctrine of equivalents to patentees. *See* Lee Petherbridge, *On the Decline of the Doctrine of Equivalents*, 31 CARDOZO L. REV. 1371 (2010) (reporting the results of an empirical examination of appellate opinions).

91. Adams, *supra* note 90.

92. Allison & Lemley, *supra* note 90, at 976–77 ("The doctrine of equivalents was largely dead by 1998."); Petherbridge, *supra* note 90, at 1379 (noting that "there is evidence supporting the claim that the doctrine of equivalents has declined" as a means for establishing infringement liability).

toward the conclusion that patentees are only rarely able to establish liability using a theory of infringement by equivalents. The decline of the doctrine is represented in figure 1, which shows that over the last fifteen years (1992–2007) the average rate of dispositive[93] patentee success in appeals addressing the doctrine of equivalents has trended downward.

Trends in Rates of Dispositive Wins[94]
Equivalents Analyses of the Federal Circuit 1992–2007

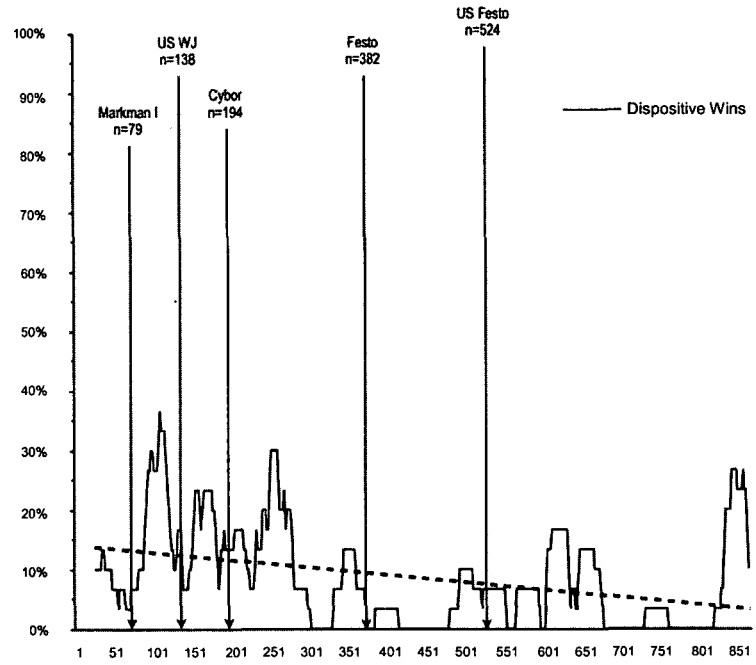

Figure 1

93. Dispositive patentee success is measured by examining all written Federal Circuit equivalents analyses and scoring as positive those that evince a mandate that an accused infringer is liable for infringement under a theory of equivalents, and scoring all others as negative.

94. The ordinate represents a 30-analysis lagged (moving) average of the percentage of dispositive patentee success, plotted against the number of analyses (n=878). It thus provides a measure of the recent-average frequency of dispositive patentee success, approximating what a lawyer might see if he or she were to sample the court's most recent twenty to twenty-five opinions on the topic at any point in time. On the abscissa, the analysis number moves from left to right (1992–2007). The linear trend line is a least squares line, having the following statistical characteristics: r = -.357, r^2 = .134, t-obs = -11.433, p = .000. The calculations for the moving average and linear regression was performed with Microsoft Excel; the graph was created using Excel.

The decline of the doctrine of equivalents can be understood as rationalizing patent law with policy and theory in the sense that it is directed to reducing the impact of information externalities produced by the patent-granting process. Perhaps the largest point to make in connection with the decline of the doctrine of equivalents is that reducing patentee access to the doctrine creates an incentive for patent applicants to draft better and more complete claims. To the extent an applicant believes that successful resort to the doctrine of equivalents is unlikely, the applicant will have to consider whether to internalize the cost of drafting claims that might *literally* provide adequate—to justify patenting—market exclusivity. An applicant cannot, however, focus only on drafting claims that are broad enough to provide adequate market exclusivity. The sticks of patent doctrine remain.[95] The claims an applicant drafts must still avoid prior art (indeed, as I explain below, failing to do so will diminish a patentee's use of whatever remains of the doctrine of equivalents), must align closely enough with the descriptive part of the specification to avoid being found invalid for failure to meet the enablement and written description requirements set forth in 35 U.S.C. § 112, and must not be so vague as to be indefinite—and therefore invalid. Thus, diminishing access to the doctrine of equivalents should in some cases encourage patent applicants to think harder about the claims they draft, and thereby perhaps produce some marginal systemic benefits.

The means by which the Federal Circuit has reduced access to the doctrine of equivalents further work to diminish the impact of information externalities produced by the patent-granting process. Here, perhaps the most significant development in the law

95. Quite obviously, this analysis assumes that the substantive law defining patent invalidity impacts—and meaningfully constrains—patent drafting behavior either because the Patent Office will not allow claims that do not meet the statutory requirements or because such claims will be invalidated should a patentee ever seek to enforce them. How the substantive law defining invalidity influences patent drafting behavior in practice is a matter of some debate. The theoretical framing set out, ante, Part II.B., posits that it may not as an empirical matter always work well at the Patent Office. If one assumes, arguendo, that it does not work reasonably well after issue either—that owners of truly "invalid" claims normally expect to be able to enforce such claims—then patentee incentives might, *inter alia*, favor claims of aggressive breadth and vagueness. That said, the Federal Circuit's doctrinal development might, even in this case, still be understood as rational if the court operates under the reasonable belief that defendants will avail themselves of the opportunity to challenge validity and that legitimate challenges can, generally, succeed.

surrounding the doctrine of equivalents that can be attributed to the Federal Circuit[96] is the development of a set of doctrines that impose legal limitations to the reach of the doctrine of equivalents. Below, I consider several doctrines that impose legal limitations and explain how they can be understood as encouraging the production of information helpful for providing the public better notice of the rights attending a patent.

Perhaps the best studied[97] legal limitation is amendment-based prosecution history estoppel, which is directed to preventing a patentee from accessing the doctrine of equivalents when a claim was amended during patent prosecution.[98] As a point of doctrinal development, the Federal Circuit was inclined to bar any range of equivalents for a claim limitation that had been amended during patent prosecution.[99] The Supreme Court pulled the law back from that place, but not far back. It endorsed a somewhat firm view of estoppel, imposing the rebuttable presumption that an amendment

96. As noted before, the Federal Circuit did not originate all of these doctrinal developments, but it is credited to varying degrees with developing and deploying them in ways that worked to diminish the importance of the doctrine of equivalents. *See, e.g.*, Johnson & Johnston Assocs. Inc. v. R.E. Serv. Co., 285 F.3d 1046, 1064 (2002) (en banc) (Newman, J., dissenting) ("Instead of deciding this appeal on the basis on which it reaches us—that is, whether to sustain the jury verdict that stainless steel and aluminum are equivalent substrates for copper foil laminates—my colleagues launch yet another assault on the doctrine of equivalents.").

97. *See* R. Polk Wagner, *Reconsidering Estoppel: Patent Administration and the Failure of* Festo, 151 U. PA. L. REV. 159 (2002) (criticizing the Supreme Court's rejection of an absolute bar to any range of equivalents for a limitation amended during the course of prosecution in large part with the argument that the holding encouraged patentees to impose information costs on the Patent Office and on the public). This Article acknowledges the arguments presented in *Reconsidering Estoppel* and confirms that the arguments offered there find some purchase when applied to other legal limitations to the doctrine of equivalents.

98. *See, e.g.*, Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 535 U.S. 722 (2002) (adopting a rebuttable presumption that a narrowing amendment surrenders equivalents); Honeywell Int'l Inc. v. Hamilton Sundstrand Corp., 370 F.3d 1131 (Fed. Cir. 2004) (en banc) (holding that canceling an independent claim and rewriting a dependent claim into independent form creates a presumption of estoppel). The arguments presented in connection with amendment-based prosecution history estoppel for the most part have force when applied to argument-based prosecution history estoppel, which seeks to prevent the patentee from recapturing through the doctrine of equivalents subject matter surrendered during patent prosecution by argument. *See* Cybor Corp. v. Fas Techs., Inc., 138 F.3d 1448 (Fed. Cir. 1998) (en banc) (recognizing estoppel by argument). Argument-based estoppel will not, therefore, be afforded separate treatment.

99. Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 234 F.3d 558, 564 (Fed. Cir. 2000) ("In response to En Banc Question 3, we hold that when a claim amendment creates prosecution history estoppel, no range of equivalents is available for the amended claim element."), *rev'd*, 535 U.S. 722 (2002).

made to satisfy a requirement of the Patent Act surrenders equivalents between the original claim and the amended claim. To overcome the presumption, "[t]he patentee must show that at the time of the amendment one skilled in the art could not reasonably be expected to have drafted a claim that would have literally encompassed the alleged equivalent."[100] Accordingly, the current rule is mandated by the Supreme Court and occasionally allows a range of equivalents for amended claims. This analysis acknowledges the current state of the law, but it generalizes the rule for discussion to that of the absolute bar because (1) that was the rule the Federal Circuit preferred, and (2) the frequency of patentee success in cases following the imposition of the Supreme Court's rule points toward the conclusion that the Supreme Court may have left the law in a state that is, practically speaking, fairly close to where the Federal Circuit thought it should be.

Refusing equivalents for amended claim limitations discourages information externalities produced by the patent-granting process because it penalizes patent applicants for overclaiming and for unclear drafting. To avoid amending claims, applicants must consider whether to take the cost of drafting claims that either will avoid rejection or, if rejected can be sustained on appeal. Put slightly differently, applicants are encouraged to draft claims that are more likely to be patentable.

Applicants can increase the probability of drafting patentable claims by doing any number of things, several of which are beneficial to the patent system. By way of example, applicants might increase their investigation and analysis of prior art before filing an application. This practice helps applicants anticipate possible prior art-based rejections and draft claims in ways to avoid encompassing prior art. To discourage rejections that might lead to amendment, applicants might also be encouraged to present and explain art to examiners in ways that reveal how the applicant understands the art to relate to the claimed invention. Applicants must still, however, use care in the vagueness employed in claiming the invention. If vagueness is understood as overbreadth, it may provoke a rejection based on prior art, or it may provoke a rejection based on the claim's

100. *Festo Corp.*, 535 U.S. at 741.

poor alignment with the descriptive part of the specification. In both instances, the risk for the applicant is that it may need to overcome the rejections by amendment (or argument[101]). Similarly, if vagueness is employed in a manner that makes claims too indefinite, an applicant, to get the claim issued, may need to either amend the claim language to improve its definiteness or, perhaps, provide additional explanation (i.e., argument) of its meaning.

These considerations should normally diminish information externalities, and in at least some cases will have the effect of encouraging the cheapest cost producer of information about the invention—the patent applicant—to produce information about the invention that makes its way into the file wrapper of the patent. The direction of the effect is generally toward better information about the invention and its relation to the art. This can be expected in some cases to improve the quality of patent examination by reducing the cost of measuring patentability, it can be expected in some cases to improve the reliability of patentees' and competitors' predictions about enforceability and value after a patent issues, and it can be expected in some cases to reduce the cost to courts of assessing infringement and validity. Moreover, when patent applicants are forced to amend their claims, public notice is furthered to an even greater extent. The amendment is notice to competitors to focus design-around efforts on the amended limitation(s). Amendment becomes the roadmap to noninfringing improvement.

Three additional legal limitations to the reach of the doctrine of equivalents that can be understood as directed to discouraging information externalities are the prohibition against a scope of equivalents that encompasses subject matter disclosed but not literally claimed in a patent specification;[102] the prohibition against a scope of equivalents that encompasses subject matter disparaged or disavowed in the descriptive part of the patent specification;[103] and

101. *See supra* note 98.

102. *See* Johnson & Johnston Assocs. Inc. v. R.E. Serv. Co., 238 F.3d 1347 (2001) (en banc) (confirming this rule).

103. Gaus v. Conair Corp., 363 F.3d 1284 (2004) ("Dr. Gaus described the invention as requiring the protective circuitry to function regardless of the operating state of the apparatus . . . . Having disavowed coverage of devices in which . . . the protective cut-off mechanism is not triggered until the water reaches the electrical operating system, the patentee cannot reclaim that surrendered claim coverage by invoking the doctrine of equivalents.").

the prohibition against a scope of equivalents that would eliminate the meaning of a claim element.[104] These legal limitations encourage applicants to consider the cost of drafting better patent specifications and claims. Like the estoppel just discussed, they work their influence by penalizing patentees for sloppy or overly aggressive patent drafting and for strategic behaviors that shift the cost of information about the legal scope of an invention from an inventor to the Patent Office and the public.

By preventing a patentee from accessing the doctrine of equivalents for subject matter disclosed but not claimed in a patent specification, the Federal Circuit helps to prevent patentees from drafting narrow claims, and then later (after issue) seeking market exclusivity much broader than the text of those narrow claims. Because the Patent Office does not examine equivalents of a claimed invention for patentability, presenting the Office with narrow claims has the effect of limiting relevant prior art and making easier an applicant's claim to patentability. Without the Federal Circuit's rule, a viable strategy for patent applicants is to fill a specification with different embodiments, draft narrow claims, directed perhaps to the most patentable ones, and then later argue that the substance of the invention included the unclaimed embodiments based on their disclosure in the specification. The advantage of the strategy to patentees is that it can decrease the cost of patent acquisition, secure patent scope that is never subject to examination by the Patent Office,[105] and, because narrow claims suggest an invention of narrow

104. Pennwalt Corp. v. Durland Wayland, Inc., 833 F.2d 931 (Fed. Cir. 1987). The Supreme Court endorsed the principle in *Warner-Jenkinson Co. v. Hilton Davis Chemical Co.*, 520 U.S. 17, 29 (1997), holding that the doctrine of equivalents should not be applied so broadly as to effectively eliminate a claim element. *Id.* at 39 n.8 ("Thus, under the particular facts of a case, . . . if a theory of equivalence would entirely vitiate a particular claim element, partial or complete judgment should be rendered by the court, as there would be no further *material* issue for the jury to resolve.").

105. It might be remiss not to point out that another legal limitation to the doctrine of equivalents is a prohibition against a scope of equivalents that encompasses the prior art. This rule is sensible enough in that it seeks to prevent a patentee from capturing through the doctrine of equivalents subject matter in the prior art and presumably unpatentable in the first instance. *See* Wilson Sporting Goods Co. v. David Geoffrey & Assocs., 904 F.2d 677 (Fed. Cir. 1990). However, the high measurement cost of patentability, *see supra* Part III.A.1, makes this rule an unwieldy and expensive one in practice. This analysis suggests that a better approach is a more balanced one. Retain the rule, for it may still be needed *ex post*. But also encourage applicants to give greater consideration to the patentability of their claims *ex ante*, thereby diminishing the

market exclusivity, misdirect competitors as to the scope of the patented invention.

By disapproving this strategy, the Federal Circuit encourages applicants to consider the cost of drafting patentable claims that more accurately define the market exclusivity sought. Applicants can increase the likelihood of successfully drafting patentable claims using the techniques described earlier in the discussion of prosecution history estoppel. But, as in that context, adjusting to the Federal Circuit's rule simply by drafting broader or vaguer claims is risky for patentees. Claims that are too broad or too vague may lead to prior art-based or patent disclosure-based rejections, which may in turn present the risks of prosecution history estoppel. Thus, the direction of the influence of the rule prohibiting the use of the doctrine of equivalents to capture disclosed but unclaimed subject matter, like the estoppel rule just discussed, is to encourage the cheapest cost producer of information about the invention—the patent applicant—to consider the cost of (and hopefully in some cases produce) socially useful information about the invention that makes its way into the file wrapper and patent.

The legal limitation to the reach of the doctrine of equivalents that prevents a patentee from accessing the doctrine in instances in which the equivalents sought encompass subject matter disavowed in the descriptive part of the patent specification further encourages applicants to consider the cost of drafting better specifications and claims. When an applicant disparages (or even more expressly disavows) subject matter in a patent specification, the act can suggest to observers like patent examiners and competitors that the subject matter is not within the scope of the invention disclosed in the patent. This sort of misdirection discourages examination of the subject matter and might lead competitors to believe that the practice of the subject matter is not an infringement. By disapproving equivalents encompassing disparaged or disavowed subject matter, the Federal Circuit rule again encourages the cheapest cost producer of information about the invention to consider taking on the cost of providing socially useful information about the boundaries of the patent right.

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need for an expensive *ex post* assessment of whether an embodiment asserted to be an equivalent would itself be patentable.

The legal limitation that prevents patentees from accessing the doctrine of equivalents when resort to the doctrine would eliminate (or vitiate) the meaning of a claim limitation works to reduce the impact of information externalities produced by the patent-granting process in a few ways, which require some explanation. In each instance, the direction of the development is to seek to discourage externalities by encouraging patent applicants to draft claims that more accurately and clearly define the market exclusivity sought.

Modern patent infringement analyses consist of two basic steps: "First, the claim must be properly construed to determine its scope and meaning. Second, the claim as properly construed must be compared to the accused device or process."[106] The second step is applied by the doctrine of the all-elements (or all-limitations) rule. The rule requires that the infringement comparison proceed on an element-by-element (or limitation-by-limitation) basis. The meaning of this is that each element (or limitation) of a patent claim must find a corresponding element in an accused device or process either literally, or equivalently. If this comparison cannot be completed for each claim element, infringement will not lie.

The application of the all-elements rule has at least two general impacts on patent applicant behavior. First, it should encourage patent applicants to choose their words carefully when making claims of invention. Placing additional elements in a claim, which typically has a narrowing impact on the scope of rights a claim confers, and which therefore usually makes patent acquisition easier and less costly, will not be overlooked in an infringement analysis. The all-elements rule thus imposes a strictness on claim drafting, encouraging applicants to seek to get the balance just right; adequate coverage must be achieved in an economy of words, but an applicant must still keep in mind the previously described constraints on overbreadth and vagueness. Second, the close comparison prescribed by the all-elements rule tends generally to limit the scope of the doctrine of equivalents by discouraging abstract, holistic arguments in favor of equivalency.

The all-elements rule also has a more specific application to the doctrine of equivalents. Sometimes known by the separate label of

106. Carroll Touch, Inc. v. Electro Mech. Sys., Inc., 15 F.3d 1573, 1576 (Fed. Cir. 1993).

"vitiation theory," the law is that a theory of equivalence cannot extend so broadly as to vitiate the meaning of a claim element. The concept of vitiation can be understood as trying to push in the direction of reducing information externalities by providing some guidance on the range of equivalents possible for a particular claim element. To be clear, it does not dispose of every theory a patentee might promote about a scope of equivalents, but it may improve clarity in some cases, especially those in which the difference between the claim limitation and the proffered scope of its equivalent can be understood as binary in character. A typical example comes from *Asyst Technologies., Inc. v. Emtrack, Inc.*,[107] in which the Federal Circuit agreed with a trial court that the doctrine of equivalents cannot be extended to reach a system using "unmounted" structural elements when the patent claim defined similar structural elements as "mounted on" a "work station."

a. Other considerations

This Article is directed to an examination of Federal Circuit doctrinal developments, and so this short subsection represents something of an aside.

Briefly, then, the empirical studies that have examined the current state of the doctrine of equivalents all point in the direction of a significant-appearing decline in the ability of patentees to use the doctrine to establish liability for patent infringement.[108] This suggests that the Federal Circuit has challenged the basic policy that underlies the doctrine of equivalents[109]—the idea that insubstantial changes to well-claimed inventions are so easy to develop and market that patent law must retain the doctrine of equivalents to ensure that innovators have adequate incentives to invent, disclose, and commercialize.

In so doing, the Federal Circuit has arguably demonstrated that the basic policy of the doctrine of equivalents is not systemically very significant. The evidence is that all the while the courts were killing the doctrine of equivalents, patent applicants were increasing

107. 402 F.3d 1188, 1195 (Fed. Cir. 2005).

108. *See, e.g.*, Allison & Lemley, *supra* note 90, at 956–58; Petherbridge, *supra* note 90.

109. Petherbridge, *supra* note 90 (making this argument).

the rate at which they filed applications for new inventions.[110] This suggests that innovators might not need the encouragement of the doctrine of equivalents to invent, disclose, and commercialize.[111] The evidence is also that more patents are subject to litigation,[112] suggesting the interpretation that patents are still capable of conferring valuable commercial rights. Together this evidence suggests that the doctrine of equivalents might be fairly unimportant in terms of systemic economic significance. If patent law decides to retain it in some form, the better policy reason might be for use in only the most exceptional cases—and essentially only for reasons of fairness. If so, this tends to validate the position of some Federal Circuit judges expressed years ago that the application of the doctrine of equivalents should be the exception, not the rule.[113]

2. Claim Construction

In its treatment of the doctrine of equivalents the Federal Circuit confronted and addressed a set of information costs that flow from the patent-granting process and tend to obscure the enforceable scope of a patent. The court's development of doctrinal rules to address these costs can be understood as rational in the sense that the rules seek to place the cleanup costs on those most cheaply able to bear them, and seek more generally to encourage a public policy that favors good public notice of patent rights. A logical consequence of these doctrines, as well as of the more general decline of the doctrine

110. *See* PATENT PUBL. ADVISORY COMM., U.S. PATENT AND TRADEMARK OFFICE, ANNUAL REPORT 1 (2001), *available at* http://www.uspto.gov/web/offices/com/advisory/acrobat/ppacannual11-30-01.pdf.

111. Another possibility is that the unavailability of the doctrine has encouraged the additional inventing behavior. In other words, the death of the doctrine of equivalents has pushed innovators to invent and disclose more, perhaps to ensure that commercial innovations (which may embody many inventions) find adequate protection. This may or may not be optimal. *See* Parchomovsky & Wagner, *supra* note 29, at 62–63.

112. *See* Wagner, *supra* note 32 (documenting the increase in patent litigation intensity); *see also* JAMES BESSEN & MICHAEL MEURER, PATENT FAILURE: HOW JUDGES, BUREAUCRATS, AND LAWYERS PUT INNOVATORS AT RISK 192 (2008) (reporting the percentage of lawsuits involving software patents).

113. London v. Carson Pirie Scott & Co., 946 F.2d 1534, 1538 (1991) (refusing to find infringement by equivalents, stating, "Application of the doctrine of equivalents is the exception, however, not the rule, for if the public comes to believe (or fear) that the language of patent claims can never be relied on, and that the doctrine of equivalents is simply the second prong of every infringement charge, regularly available to extend protection beyond the scope of the claims, then claims will cease to serve their intended purpose.").

of equivalents as a liability-establishing tool, has been to concentrate the analytical task of assessing a patent's scope on the patent document itself, and much more specifically on a patent's claims.

The analytical process used to determine patent scope from the text of a patent claim is generally known as *claim construction.* Claim construction involves construing, or interpreting the words of, a patent claim. The basic idea is to operationalize the words of the claim—to make them get up and go to work in analyses of infringement, patentability, and enforceability. And, in view of the reform of the doctrine of equivalents described above, the idea that the law required a complementary development of claim construction doctrine seems entirely rational, if not a fait accompli.

The remainder of this section describes very generally the efforts the court has made to develop claim construction doctrine. In so doing, it points out that Federal Circuit–driven developments in claim construction law can be understood as seeking to rationalize patent law with patent policy and theory in much the same way as the court's reforms of the doctrine of equivalents. However, the discussion also points out that the Federal Circuit's development efforts seem to have stalled with its opinion in *Phillips v. AWH Corp.*[114] The court's opinion in the case can be understood as a retreat from legal development in the area of claim construction, and when considered in view of the developments the court had previously undertaken, the opinion in *Phillips* seems best understood as having a derationalizing impact—to some extent attenuating patent law from patent policy and theory.

a. Early movement toward rationalization

The Federal Circuit has worked to improve the law of claim construction, perhaps beginning in earnest with its decision in *Markman v. Westview Instruments.*[115] After granting certiorari, the Supreme Court affirmed the Federal Circuit's conclusion that the interpretation of patent claims was "exclusively the province of the court,"[116] as opposed to a jury. Among the bases for the Supreme Court's holding was the argument that:

114. 415 F.3d 1303 (Fed. Cir. 2005) (en banc).

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

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

> [t]he construction of written instruments is one of those things that judges often do and are likely to do better than jurors unburdened by training in exegesis. Patent construction in particular "is a special occupation, requiring, like all others, special training and practice. The judge, from his training and discipline, is more likely to give a proper interpretation to such instruments than a jury; and he is, therefore, more likely to be right, in performing such a duty, than a jury can be expected to be[,]" . . . , for "the claims of patents have become highly technical in many respects as the result of special doctrines relating to the proper form and scope of claims that have been developed by the courts and the Patent Office."[117]

A natural understanding of the idea that judges need to construe patent claims because of the "highly technical" nature of claims resulting from "special doctrines" controlling claims' form and scope is that—while ultimately a "mongrel practice"—claim construction should be understood as having a strongly legal aspect. In view of the theory of the Federal Circuit set out earlier,[118] the description of claim construction as having a strongly legal aspect means that, "allocating the interpretive task to judges [sh]ould extend and enhance the development of legal rules guiding the construction of patent claims."[119]

After *Markman*, one issue of internal dispute at the Federal Circuit was how much deference to give trial court interpretations of patent claims. Using the vehicle of *Cybor Corp. v. Fas Technologies, Inc.*,[120] the Federal Circuit concluded that the answer was none, reasoning that the task of claim construction was "purely legal."[121] The decision concentrated in the Federal Circuit control over the claim construction issue to the point that the Federal Circuit now had (formally) nearly unfettered power over the scope, content, and

117. *Id.* at 388–89 (citation omitted).

118. *See supra* Part I.

119. This framing has been developed in earlier work. *See* Wagner & Petherbridge, *supra* note 9, at 1120–24.

120. 138 F.3d 1448 (Fed. Cir. 1998) (en banc).

121. *Id.* at 1456.

application of the "special doctrines"—or rules—of claim construction.

Taken together, *Markman* and *Cybor* can be understood as moving toward the goal of rationalizing the law[122] because both represent steps helpful to getting the Federal Circuit the power over the law necessary to develop and improve it. And, by several accounts, the Federal Circuit began using the power: it started to experiment with approaches to the claim construction task.[123]

Given the various accounts, it is hard to articulate with precision a unifying theme for the court's experimentation. If there was a unifying theme, it may well have been the development of a view among at least some of the judges that there should be a "right" way to do claim construction. By using the proper approach—for example, by creating a theory of claim construction, or, perhaps, a process of using the evidence available to give meaning to claim scope—the Federal Circuit might help give greater predictability to the claim construction exercise. A reason predictability might be enhanced by an approach that emphasizes a "right" way to do claim construction is because substantive rules, or, perhaps, analytical rules, could have the benefit of addressing some of the information costs involved in the claim construction process.

For example, rules could be used to define the validity and relative weight of pieces of information that can be brought to bear in a claim construction analysis. Thus, rules might be expected in some instances to reduce uncertainty about whether a court will accept a piece of information as probative of the meaning of claim language. In other instances, rules framing the task of claim construction might prescribe the relative weight information should be given. Thus,

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122. As this Article is directed to revealing a rational course of doctrinal development over broad swaths of law, it cannot address all arguments critical of the doctrinal developments it discusses. And when it comes to *Markman* and especially *Cybor*, there is no lack of criticism. *See* R. Polk Wagner & Lee Petherbridge, *Did* Phillips *Change Anything?: Empirical Analysis of the Federal Circuit's Claim Construction Jurisprudence* 5–6 nn.20–21 (Apr. 3, 2009) (unpublished manuscript, on file with author) (collecting commentary on the cases); Wagner & Petherbridge, *supra* note 9, at 1109 n.10, 1124 n.80 (same).

123. *See* Craig Allen Nard, *A Theory of Claim Interpretation*, 14 HARV. J.L. & TECH. 2, 4 (2000) (emphasizing the existence of two approaches to claim interpretation: "hypertextualism" and "pragmatic textualism"); Wagner & Petherbridge, *supra* note 9 (empirically demonstrating procedural and holistic approaches); Christopher A. Cotropia, *Patent Claim Interpretation Methodologies and Their Claim Scope Paradigms*, 47 WM. & MARY L. REV. 49 (2005) (arguing that patent law evinces distinct claim construction paradigms and methodologies).

rules might be expected to have a marginal impact on the cost of information in an analysis—they can be used to tell whether, and how much, a litigant needs to worry about a particular theory an opponent presses.

By prescribing a theory of claim construction, or a set of rules that frame a process for using information in a claim construction analysis, the Federal Circuit might also provide valuable formative information to the patent community as a whole. If the court tells parties that particular sources of information are especially influential, or even dispositive, it has explained to parties who might desire to secure a particular scope of coverage how to secure that coverage. It has also informed the Patent Office how the court will treat the claim. The Patent Office can then make efforts to provide that its "broadest reasonable" construction is at least as broad as what a court might give. Thus, the information provided by rules addresses information costs not only *ex post*; it also has a formative impact: it may help to guide and channel the behavior of patent applicants *ex ante*.

To be clear, it is presumably no small feat to prescribe sensible rules for the interpretation of a patent claim that are reliable enough to predictably channel information and guide competitor behavior.[124] But it is not clear that it cannot be done. And if it can be done, greater public notice of patent rights might be had, improvements to patented subject matter might be made more confidently, and transactions around patents might occur more efficiently. Competitors might better predict how a court—and ultimately the Federal Circuit—would interpret a claim, thereby encouraging settlement of some marginal number of cases. Trial judges might approach summary judgment more confidently, believing that if they apply the process of claim construction laid down by the Federal Circuit, they will be likely to obtain a correct interpretation. By this avenue summary judgment might come more quickly and efficiently in patent cases, with the summary determinations being often

124. *Accord* S. Jay Plager, *The Federal Circuit as an Institution: On Uncertainty and Policy Levers*, 43 LOY. L.A. L. REV. 749, 761 (2010) (observing that claim construction decision making may be an act of judgment based imposed on situations that are "never the same" and in which the "issues are inevitably a blend of facts and law as well as context and technology"); Mullally, *supra* note 33 (identifying sources of uncertainty in patent law and suggesting an approach for addressing uncertainty).

affirmed on appeal should anyone bother. In sum, the promise of using reasonable rule constraints[125] to define a "right" way to do claim construction are the systemic advantages of reduction in transactional cost and encouragement of good public notice of the patent right.[126] Advantages that might improve the benefits the public receives from the patent system.

b. Stalled

For some reason, the experimentation that did happen did not produce doctrinal changes with enough jurisprudential purchase to last.[127] Perhaps the most significant blow to the then-ongoing judicial

125. This is not an article directed to what the content of any rules constraining the claim construction process should be; however, one anticipates that whatever rules might develop should be reasonable in the sense that their strictness would not prevent an appropriate level of decisional flexibility in the fraction of potential patent disputes in which such flexibility might be needed.

126. *See* Brief of Amicus Curiae Law Professors R. Polk Wagner & Joseph Scott Miller, Phillips v. AWH Corp., No. 03-1269 (Fed. Cir. Sept. 20, 2004).

127. It is well beyond the scope of this Article to analyze why this might have been the case. Some of the leading theories might include that the task of claim construction—essentially interpreting words in a document—is so inherently indeterminate that it cannot be given constraints that guide and channel it in any way. *See* David Schwartz, *Courting Specialization: An Empirical Study of Claim Construction Comparing Patent Litigation Before Federal District Courts and the International Trade Commission*, 50 WM. & MARY L. REV. 1699 (2009). Another view is that the judges just could not reach agreement; as individuals perhaps they were too unwilling to part with their own views about the task and controlling law to reach the compromise needed to move the law. Another view still is that the development process was adversely affected by the influence of the construct of a person of ordinary skill in the art—a dominant feature of the patent law. *See* John M. Golden, *Construing Patent Claims According to Their "Interpretive Community": A Call for Attorney-Plus-Artisan Perspective*, 21 HARV. J.L. TECH. 321, 328 (2008) (proposing that the perspective of the ordinary artisan be rejected by the patent law in the context of claim construction and replaced with a "hybrid" one that increases emphasis on the legal aspects of the task). Another theory still is that the Federal Circuit is captive to the quality of the Patent Office's performance. The court's heavy reliance on evidence intrinsic to the patent—especially the specification and claims—places the court in a position in which it is in some respects at the whim of how well the patent office performs its task of ensuring that patent disclosures contain quality information about the scope of the claim of right to an invention.

Still another theory might be that the court's jurisprudence simply could not handle the weight of the criticism that the reversal rate of trial court claim interpretations is too high. The reported reversal rates range from roughly 30 to 50 percent. *See* Christian A. Chu, *Empirical Analysis of the Federal Circuit's Claim Construction Trends*, 16 BERKELEY TECH. L.J. 1075, 1100–06 (2001) (reporting reversal rates); Kimberly A. Moore, *Are District Court Judges Equipped to Resolve Patent Cases?*, 15 HARV. J.L. & TECH. 1, 17–31 (2001) (same); *id.* at 27 ("The high reversal rate on claim construction is problematic."); *id.* at 28 (referring to "the high percentage of reversals" when it comes to claim construction); Kimberly A. Moore, Markman *Eight Years Later: Is Claim Construction More Predictable?*, 9 LEWIS & CLARK L. REV. 231, 243–47 (2005) (updating Moore's prior study); David L. Schwartz, *Practice Makes Perfect? An Empirical Study of Claim Construction Reversal Rates in Patent Cases*, 107 MICH. L. REV. 223

innovation was struck in *Phillips v. AWH Corp.*[128] In the opinion, the court confronted a dispute between judges who had been promoting distinct doctrinal approaches to determining the correct meaning of patent claims.[129] Purporting to "clarif[y]"[130] its jurisprudence, the court rejected the concept that there is a "right" way to analyze claim scope:

> [T]here is no magic formula or catechism for conducting claim construction. Nor is the court barred from considering any particular sources or required to analyze sources in any specific sequence, as long as those sources are not used to contradict claim meaning that is unambiguous in light of the intrinsic evidence . . . . The sequence of steps used by

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(2008) (reporting reversal rates); *see also* Gretchen Ann Bender, *Uncertainty and Unpredictability in Patent Litigation: The Time Is Ripe for a Consistent Claim Construction Methodology*, 8 J. INTELL. PROP. L. 175, 207 (2001); *id.* at 221–22 ("Given the confusion expressed by the trial courts about claim construction procedures and the extremely high percentage of changes to claim construction language by the Federal Circuit, claim construction is not consistent or predictable at either the trial or the appellate level."); Michael Saunders, *A Survey of Post-*Phillips *Claim Construction Cases*, 22 BERKELEY TECH. L.J. 215 (2007); Andrew T. Zidel, *Patent Claim Construction in the Trial Courts: A Study Showing the Need for Clear Guidance from the Federal Circuit*, 33 SETON HALL L. REV. 711, 741–42 (2003).

The idea that the reversal rate(s) measured by the above-referenced studies is too high has been very recently challenged. *See* Richard S. Gruner, *How High is Too High?: Reflections on the Sources and Meaning of Claim Construction Reversal Rates at the Federal Circuit*, 43 LOY. L.A. L. REV. 981, 985 (2010) (arguing that a host of social harms linked to measured reversal rates conventionally understood to be "high" are "mistaken interpretations" and that, in light of selection effects arguably causing only problematic construction cases to be presented to the Federal Circuit after most simpler cases have been settled, "the surprising question is not why the Federal Circuit claim construction reversal rates are so high,but rather why these rates are not even higher'"). *But see* Ted Sichelman, *Myths of (Un)Certainty at the Federal Circuit*, 43 LOY. L.A. L. REV. 1161, 1193 (2010) (arguing in response to Professor Gruner: "claim construction reversal rates not only appear high, but after considering a variety of explanations—including selection bias—actually are high").

128. For a more complete treatment of the impact of the *Phillips* opinion, as well as a normative analysis, see Wagner & Petherbridge, *supra* note 122 (presenting an empirical assessment of the impact of the *Phillips* opinion).

129. The different approaches have been described elsewhere. *See* Wagner & Petherbridge, *supra* note 9 (describing "procedural" and "holistic" approaches to the claim construction inquiry). The procedural approach emphasized the use of procedural constraints to guide and channel information usage. It emphasized judicial reliance on commonly held meanings of patent claim terms gleaned from objective, publicly available sources and placed the burden of arguing for deviations from that "ordinary" meaning on the patent applicant. The holistic approach, by contrast, permitted varying and unpredictable emphasis on one or another form of interpretive aid. Thus, in some cases claim language would be dispositive, while in others snippets from the specification, or descriptions or pictures of embodiments, might be controlling. In still other instances, emphasis might fall on the prosecution history.

130. 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc).

> the judge in consulting various sources is not important; what matters is for the court to attach the appropriate weight to be assigned to those sources in light of the statutes and policies that inform patent law. In [our precedents], we did not attempt to provide a rigid algorithm for claim construction, but simply attempted to explain why, in general, certain types of evidence are more valuable than others.[131]

The clear message from *Phillips* is that claim construction is not a task that should be guided and shaped by rules. Instead, courts should select and judge information useful for establishing claim scope on a case-by-case basis in light of the statutes and policies that inform patent law. Given the language of the court's opinion, it appears that what a number of observers understood as efforts at judicial innovation, should now be understood as doing little more than providing "general" information about how the statutes and policies of patent law interacted with the sources of information present in some prior cases.

Confirming the idea that the central message of *Phillips* is that there is no "right" analytical framework for construing claims, the Federal Circuit has sought to discourage language in subsequent opinions suggesting that there might be a definable process for construing claims. In a recent case[132] the court took the relatively unusual step of issuing a correction[133] to an opinion on this point, striking and replacing language that indicated that the panel might have imposed a framework on its claim construction analysis:

After the word id. at line 14, strike:

> *Phillips* teaches that these sources should be accorded relative weights in the order listed, with the words of the claims themselves being the most relevant. Id. at 1314–19. Accordingly, we discuss each source of meaning of the claim term . . . in this order.

And replace with:

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131. *Id.* at 1324.

132. Tim Holbrook deserves credit for bringing this case—*Microprocessor Enhancement Corp. v. Texas Instruments Inc.*, 520 F.3d 1367, 1378 (Fed. Cir. 2008)—to my attention.

133. Appeal No. 07-1249 (Apr. 16, 2008) (correcting the original opinion decided April 1, 2008).

> *Phillips* teaches that these sources should be accorded relative weights depending on the circumstances of the case, with intrinsic sources being the most relevant. Id. at 1314–19. Accordingly, we discuss each source of meaning of the claim term . . . granting each source the required relative weight.

It is also worth noting that *Phillips* does not overrule[134] any case or in any meaningful way prevent a trial judge or Federal Circuit panel from deciding in any particular case that there is a "right" way to do claim construction. In other words, notwithstanding the language just quoted, there is no prohibition against concluding that claim meaning should be determined from an objective, publicly available source like a seminal scientific article or a dictionary and sticking with that interpretation unless a party can show that the patent applicant clearly intended another meaning. Thus, when it comes to claim construction, judges are largely free to conclude what they want, by whatever means they want.

c. Why Phillips *is "derationalizing"*

In view of *Markman* and *Cybor*—through which the Federal Circuit grabbed final power over all things claim construction—the court's opinion in *Phillips* arguably represents a derationalization of the law. One of the main benefits to the patent system of the Federal Circuit taking plenary power over the scope, content, and application of the law is that the court can use that power to manage and direct the law's development. Such power might be used to experiment with ways to improve the public notice function of patents so that improvements to existing innovations and deals around patents could occur more efficiently. But by declaring that there is no "right" way to do claim construction, the *Phillips* opinion seems to be a statement that the court will not take this path.

If it is true that the court has abandoned the process of trying to develop the law, then there may be less reason for the court to have the plenary power it has taken. Perhaps the most plausible remaining reason might be to have the power to correct wayward trial court

134. *Accord Phillips*, 415 F.3d. at 1319–23 (discussing Texas Digital Sys., Inc. v. Telegenix, Inc., 308 F.3d 1193 (Fed. Cir. 2002)).

decisions. But this rationale presents very serious questions. Perhaps the most pressing of these is, given the flexibility with which information can enter and influence the post-*Phillips* claim construction analysis, how is the Federal Circuit to be confident that its view of the meaning of the claim language is any better than that of the trial court? Are the kinds of claim construction errors the Federal Circuit can be confident about in a post-*Phillips* world the kind that it needs plenary power to correct?

The concern is amplified when one appreciates that while claim construction may have a strongly legal aspect, it also has a factual aspect. As the Supreme Court noted, it is a "mongrel" practice. Plenary power seems to make sense when the court uses it to "ride herd" on the patent law generally, guiding all courts in the intake and use of facts and information helpful to assessing the proper meaning of claim language in view of the statutes and policies of the law. In addition, when the law defines the contours of the use of facts and information, lower court decisions on such use seem amenable to appellate review.

Plenary power seems to make less sense when it is imposed only to validate *ex post* decisions involving conclusions of fact that can be legitimately disputed. When power is used in this way, the problems generally recognized in appellate review of factual determinations begin to loom. Without an analytical framework for addressing claim construction, the law should expect more problems from evidence that is "lost in print" and more cases in which such evidence becomes "especially pregnant."[135] There will be more cases where the Federal Circuit should hesitate to assume that the factual aspects of the claim construction analysis could not have controlled. And while prescribing an analytical framework for claim construction may not entirely solve this problem, it at least provides a means of mitigation.

There is always, in patent cases, the patent itself. A fair read of the *Phillips* opinion suggests that the patent document itself is the remedy to the concerns just raised.

> Much of the time, upon reading the specification [from the perspective of its role in teaching a person of ordinary skill

135. *See* Nat'l Labor Relations Bd. v. Universal Camera Corp., 190 F.2d 429 (2d Cir. 1951).

> in the art], it will become clear whether the patentee is setting out specific examples of the invention to accomplish those goals, or whether the patentee instead intends for the claims and the embodiments in the specification to be strictly coextensive. The manner in which the patentee uses a term within the specification and claims usually will make the distinction apparent.[136]

There are, however, reasons not to be too sanguine over the backstopping powers of the patent document. Those reasons have already been amply discussed in this Article.[137] Briefly summarized, the theory suggests that patent applicants and the Patent Office have strong incentives to seek vagueness in patent claims and specifications. If this is so, the Federal Circuit's plans to use the patent document—and particularly the descriptive part of the specification—to backstop the looseness of claim construction analysis might be somewhat unrealistic. The patent-document-solves-everything approach expressly adopts a deferential posture to a source of information, that to be useful, depends in significant part on how strictly the Patent Office administers the patent-granting process. Thus, a quite likely post-*Phillips* future is one in which the Federal Circuit is regularly confronted with a plurality of equally good-appearing constructions of the claims at issue in any particular case. The court will have to choose one because that is the role it has taken for itself; but in view of all that could have gone into a construction being reviewed, the court might have a tough time in some cases identifying a "best" construction. Given the looseness of the analysis, the court might also have a difficult time articulating how it got to the construction that it did with explanations that might be predictably applied to future cases.

Thus, the impact of the *Phillips* opinion seems derationalizing. The court seems to have abandoned experimenting with means to improve the public notice function of patents, but not in the obvious service of any other equally weighty purpose. The approach taken

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136. *Phillips*, 415 F.3d at 1323.

137. *See supra* Part II.B; *see also* Sichelman, *supra* note 127, at 19 (rejecting the court's argument that parties can with reasonable certainty and predictability distinguish between using the specification to interpret claim meaning (a generally accepted if not lauded practice) and using the specification to (improperly) import an additional limitation to a patent claim).

seems logically to encourage unpredictability in claim construction. Decision makers will be forced to make choices from a menu of complex and contradictory information with little guidance as to how to elect in ways consonant with patent law and policy. Moreover, the looseness of the inputs and inquiry will further amplify the importance of the factual aspects of claim construction analysis, which could have the impact of calling into serious question the Federal Circuit's posture of de novo review.

IV. CONCLUSION

This Article has explained how doctrinal developments conventionally attributed to the Federal Circuit can be understood as rationalizing patent law with patent policy and theory. In the context of obviousness, the court developed doctrine that sought to harmonize patent law with the purpose of the obviousness inquiry. The same developments can also be read as addressing theoretical concerns about the costs of erroneous Patent Office decision making, and the difficulty of applying the obviousness standard. And, as the discussion speculates, the doctrinal development may have positioned the law well for future development.

In the context of patent scope, the Federal Circuit has targeted information externalities that impact the patent-granting process and, logically, later impact transactions involving patents. The main thrust of the court's efforts has been to seek to place the cost of information on patentees; particularly as that cost relates to providing more complete and clearer patent claims. In the area of the doctrine of equivalents this was pursued through a number of legal limitations that restrict the use of the doctrine of equivalents where patentees could have drafted better claims and specifications, but did not. A logical consequence of this approach was to focus the public notice function of patents squarely on the text of the patent claims. The court took steps initially to establish in itself the power needed to develop the law involved in construing claim text. It also took steps in the direction of innovation, experimenting with methodologies for doing claim construction that—like its innovation in the doctrine of equivalents—sought to leverage the information wealth of the patent applicant to improve the public notice function of patent claims. The court has since, in its opinion in *Phillips*, appeared to abandon its

experiments in favor of an analysis that is largely unconstrained beyond very general notions of the importance of the patent document to the task of construction.

This Article is already too long, and so I will seek to close it with a single observation. Much of the Federal Circuit's work with respect to patent scope seems to depend heavily on the idea that the substantive law defining patent invalidity, the doctrines of novelty, nonobviousness, enablement, description, definiteness, etc., has the power to substantially discipline patentee disclosure and claiming strategies. There is little doubt that the law structurally reflects this discipline. But if, for some reason, the disciplining force of these doctrines is not strongly enough felt by patent applicants, the Federal Circuit's innovations might not be fully effective.

For example, if competitors are regularly more passive with the validity aspects of a patent suit than with the infringement aspects,[138] and this feature of patent litigation is systemically understood, patentees might feel relatively confident using breadth and vagueness in patent claims. At a systemic level, if the threat of invalidity for overreaching or vague claims is not substantial, patent litigation might increasingly concentrate on claim construction. The claims involved, however, might be marginally more broad and vague, and presented in the context of a patent specification that is marginally less descriptive and less well aligned with the claims presented; but that is also one the court has little choice but to rely heavily upon. Thus, if the threat of invalidity is not "real" enough to encourage patentees to draft closer to patentable claims, the Federal Circuit's rules, while they can be understood as quite rationally adjusting incentives in response to basic policies and theories of patent law might not be working as well as we all might hope.

138. There are reasons patent competitors may be more passive here. The most apparent reason is the presumption of validity. 35 U.S.C. § 282 (2006). In addition, as was discussed earlier, the measurement cost of obviousness is high, making validity challenges perhaps more expensive than infringement challenges.