

RECONSIDERING ESTOPPEL: PATENT ADMINISTRATION AND THE FAILURE OF *FESTO*

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Last Term, in Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., the United States Supreme Court missed perhaps the most important opportunity for patent law reform in two decades. At the core of the failure to grasp the implications of “prosecution history estoppel”—a judicially crafted principle limiting the enforceable scope of patents based on acts occurring during their application process—is the heretofore universal (but ultimately unsupportable) view of the doctrine as an arbitrary ex post limitation on patent scope. This Article demonstrates the serious flaws in this traditionalist approach, and develops a new theory of prosecution history estoppel based on its ex ante effects. This shift of focus from the allocation of liability during infringement (ex post) to the way the rule generates incentives both during and before inventors apply for patents (ex ante) offers substantial insights into the central role that this venerable doctrine plays in the modern patent administrative system. In particular, the Article argues that prosecution history estoppel is best viewed as an information-forcing default penalty rule, where the possibility of lost patent scope induces patentees to produce socially valuable information early in the life of the patent. Other benefits include the internalization of costs related to certain activities during patent prosecution, and increased enforcement of the institutional arrangements between the Patent Office and the judiciary. Indeed, the considerable analytic advantages observed in this context strongly suggest that the Article’s methodological approach of reconsidering the patent law in an explicitly ex ante framework has applications well beyond prosecution history estoppel.

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INTRODUCTION

Last Term, the United States Supreme Court considered perhaps the most important issue of patent law reform in two decades.¹ In *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.* (“*Festo VII*”),² the Court opined upon the venerable and seemingly obscure doctrine of “prosecution history estoppel,” a judicially crafted rule that limits the enforceable scope of patents based upon activities during their application process (their “prosecution,” in patent parlance).³ Yet the important tale here is not the Court’s foray into “this most metaphysical branch of modern law,”⁴ nor even the wisdom of the decision on its own terms. The significance of *Festo* is that—despite the enormous implications of the decision for our modern system of patent administration—the opportunity for meaningful reform of the patent prosecution process went unrecognized and unmentioned, swept aside by a narrow, statist, and ultimately illogical approach to the central issue involved. Indeed, the failure of the Court to even seriously consider the real (as opposed to the illusory) implications of the doctrine of prosecution history estoppel is all the more ironic in an era when the patent administration system is increasingly under fire for the very problems that *Festo* could have addressed.⁵

¹ In 1982, the United States Court of Appeals for the Federal Circuit was created and vested with exclusive appellate jurisdiction over cases arising under the patent laws. See Federal Courts Improvement Act of 1982, Pub. L. No. 97-164, 96 Stat. 25 (codified as amended in scattered sections of 28 U.S.C.) (creating the Federal Circuit); 28 U.S.C. § 1295(a) (2000) (defining the jurisdiction of the Federal Circuit).

² 122 S. Ct. 1831 (2002).

³ *Id.* at 1835.

⁴ *Hogg v. Emerson*, 47 U.S. (6 How.) 437, 485 (1848) (describing the patent law). Judge Giles Rich also famously described the patent law as “the metaphysics of law” during congressional hearings concerning the 1952 Patent Act. *Patent Law Codification and Revision 1951: Hearings on H.R. 3760 Before Subcomm. No. 3 of the House Comm. on the Judiciary*, 82d Cong. 153 (1951).

⁵ Much of the recent criticism relates to the failures of the patent system to adequately evaluate inventions. See, e.g., LAWRENCE LESSIG, THE FUTURE OF IDEAS: THE FATE OF THE COMMONS IN A CONNECTED WORLD 205-15 (2001) (questioning the patent system’s treatment of patents affecting cyberspace); Robert P. Merges, *As Many as Six Impossible Patents Before Breakfast: Property Rights for Business Concepts and Patent System Reform*, 14 BERKELEY TECH. L.J. 577, 606-15 (1999) (“A recurring theme in the assessment of PTO performance is poor examination quality . . .”); John R. Thomas, *Collusion and Collective Action in the Patent System: A Proposal for Patent Bounties*, 2001 U. ILL. L. REV. 305, 316-22 (stating that examiners are prone to issue invalid patents because of insufficient samples of prior art); Simson L. Garfinkel, *Patently Absurd*, WIRED, July 1994, at 104 (criticizing the Patent Office’s approach to software patents); James Gleick, *Patently Absurd*, N.Y. TIMES MAG., Mar. 12, 2000, at 44, 47 (reporting that “the patent office has neither the time nor the expertise needed to distinguish good patents

The frustration of this most recent effort to clarify and stabilize the administration of the patent system⁶ stems from the (remarkable) fact that neither the courts nor the commentators, to date, have recognized the incompleteness of the contemporary view of prosecution history estoppel and the deficient theoretical cul-de-sac into which the current debate leads. That is, the conventional—and apparently universal—approach to the issue is directed to the purported interplay between prosecution history estoppel and the “doctrine of equivalents”⁷ (another judicially created canon, allowing infringement to be found on the basis of an “equivalent” of a patented invention).⁸ As

from bad”); Jeff Bezos, *An Open Letter from Jeff Bezos on the Subject of Patents* (proposing changes to the way that patent law addresses business method and software patents), at http://www.oreilly.com/news/amazon_patents.html (last visited Oct. 13, 2002); *Legal Resources for Surviving the Patenting Frenzy of the Internet, Bioinformatics and Electronic Commerce* (arguing that “strained conditions” in the form of scarce time and resources keep patent examiners from sufficiently evaluating applications leading to the issuance of bad patents), at <http://www.bustpatents.com> (last visited Oct. 13, 2002).

⁶ The Federal Circuit’s majority opinion in *Festo* was premised on its view that two decades of experience with prosecution history estoppel had brought into focus the uncertainty and confusion surrounding its application. See *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.* (“*Festo VI*”), 234 F.3d 558, 574-75 (Fed. Cir. 2000) (en banc) (“[A]fter nearly twenty years in performing our role as the sole court of appeals for patent matters . . . the notice function of patent claims has become paramount, and the need for certainty as to the scope of patent protection has been emphasized.”), *rev’d*, 122 S. Ct. 1831 (2002).

⁷ On the doctrine of equivalents, see *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 21 (1997) (“Under this doctrine, a product or process that does not literally infringe upon the express terms of a patent claim may nonetheless be found to infringe if there is ‘equivalence’ between the elements of the accused product or process and the claimed elements of the patented invention.”); *Graver Tank & Mfg. Co. v. Linde Air Prods. Co.*, 339 U.S. 605, 609 (1950) (describing what constitutes equivalency).

⁸ Regarding the conventionally understood relationship between prosecution history estoppel and the doctrine of equivalents, it would be an understatement to say that the standard view of prosecution history estoppel considers the rule as nothing more (and nothing less) than a limitation on the doctrine of equivalents. Indeed, such a view appears to be universal among courts and commentators alike. See, e.g., *Festo VII*, 122 S. Ct. at 1839 (describing prosecution history estoppel as integral to the analysis of the doctrine of equivalents); *Festo VI*, 234 F.3d at 562-63 (describing the issue in *Festo* as “relating to the doctrine of equivalents”); Matthew J. Conigliaro et al., *Foreseeability in Patent Law*, 16 BERKELEY TECH. L.J. 1045, 1047 (2001) (describing prosecution history estoppel as intended to limit the scope of the doctrine of equivalents); Ronald D. Hantman, *Prosecution History Estoppel, Part I*, 73 J. PAT. & TRADEMARK OFF. SOC’Y 121 (1991) (describing prosecution history estoppel as a means of determining patent scope); Janice M. Mueller, *Crafting Patents for the Twenty-First Century: Maximize Patent Strength and Avoid Prosecution History Estoppel in a Post-Markman/Hilton Davis World*, 79 J. PAT. & TRADEMARK OFF. SOC’Y 499, 501-02 (1997) (“[T]he most critical portion of *Hilton Davis* is its treatment of prosecution history estoppel as a limitation on the doctrine of equivalents.”); Jeremy E. Noe, *Paradise Lost but Recaptured*:

such, contemporary analyses of prosecution history estoppel have become hopelessly entangled with the policy bases underlying the doctrine of equivalents, rather than addressing estoppel on its own terms.⁹ This “equivalents-centered” approach to prosecution history estoppel—which considers the rule through the monochromatic lens of patent scope—views the debates over the doctrine as simply a manifestation of an ongoing ideological struggle over the contours of optimal patent protection.¹⁰

Prosecution History Estoppel Weakened in Warner-Jenkinson Co. v. Hilton Davis Chemical Co., 8 FED. CIR. B.J. 1, 2 (1998) (“Congress ideally should codify the doctrine of prosecution history estoppel, strictly viewing that doctrine’s operation as an absolute bar on expansion of claim limits.”); John R. Thomas, *On Preparatory Texts and Proprietary Technologies: The Place of Prosecution Histories in Patent Claim Interpretation*, 47 UCLA L. REV. 183, 191 (1999) (acknowledging a fundamental role of prosecution history as preventing “a patentee from seeking expansive claim coverage under the Doctrine of Equivalents”); Paul J. Otterstedt, Note, *Unwrapping File Wrapper Estoppel in the Federal Circuit: A New Economic Policy Approach*, 67 ST. JOHN’S L. REV. 405, 406 (1993) (“[Prosecution history estoppel] forbids an inventor from recapturing, through the doctrine of equivalents, claims that were surrendered during the prosecution process . . .”).

⁹ See, e.g., *Festo VI*, at 575-78 (arguing that a strong form of prosecution history estoppel is beneficial by limiting the scope of equivalents, providing notice and certainty); *id.* at 620-21 (Linn, J., concurring in part and dissenting in part) (“[T]he majority unfairly tips the balance away from patentees and toward competitors by constraining the legitimate rights of patentees to their inventions . . .”); *id.* at 641-42 (Newman, J., concurring in part and dissenting in part) (“The doctrine of equivalents has not been deemed superfluous as an instrument [of] justice, and not until today has it been deemed ‘unworkable’ by this court. The Federal Circuit’s sua sponte change in this law is a change in industrial policy that requires public discussion in advance of, not after, the law has been changed.”).

¹⁰ For example, in their recent analysis of prosecution history estoppel, Conigliaro, Greenberg, and Lemley frame the issue as one requiring the balancing of the competing policy goals of (a) adequately protecting the patentee-inventor and (b) clearly notifying the public about the scope of protection:

In the context of the doctrine of equivalents, the law best promotes progress by the careful balancing of dynamic protection for the patentee and clear notice to the public of what products will infringe the patent. Each of these patent functions is fundamental, and it is only by their harmonious interplay that patent law can encourage both technological improvements and pioneering inventions.

Conigliaro et al., *supra* note 8, at 1056.

In the larger debate about patent scope, those suggesting broad protection assert that patentees will then be better able (and more strongly encouraged) to coordinate technological development. See, e.g., F. Scott Kieff, *Property Rights and Property Rules for Commercializing Inventions*, 85 MINN. L. REV. 697, 707-12 (2001) (arguing that the patent system promotes technological progress through commercialization when technological economic factors would not achieve the same end); Edmund W. Kitch, *The Nature and Function of the Patent System*, 20 J.L. & ECON. 265, 265 (1977); see also JOSEPH A. SCHUMPETER, *CAPITALISM, SOCIALISM, AND DEMOCRACY* 106 (1st ed. 1942).

Those arguing for more limited scope respond that competition, rather than co-

This Article takes issue with the traditional, equivalents-centered view of prosecution history estoppel, reconceptualizing the doctrine within the framework of incentives and strategic choices involved in the modern patent administration system. Indeed, I contend that prosecution history estoppel cannot be viewed solely in terms of the doctrine of equivalents. The relationship between the two doctrines is entirely instrumental; that prosecution history estoppel implicates patent scope is not the *end* of the analysis, but the *beginning*. For it is this effect on patent scope (and thus the underlying value of the patent grant) that supports a broader, incentives-oriented role for the canon. Accordingly, this Article offers a theory of prosecution history estoppel as significant to the central goal of the patent administration system: producing information related to the crucial relationship between innovation, disclosure, and patent scope.¹¹

This theory is supported by two insights into the functional characteristics of the doctrine. The first is that prosecution history information generated prior to and during the prosecution of the patent is enormously important to the system of patent administration. A major concern in the modern patent system is uncertainty surrounding the ultimate coverage of a patent; that is, the relationship between invention, disclosure, and patent scope that is at the core of the social compact of the patent system.¹² Ambiguity in this context makes evaluating patentability difficult, undermines financial valuations, re-

ordination, is likely to yield better technical progress. *See, e.g.*, Rebecca S. Eisenberg, *Patents and the Progress of Science: Exclusive Rights and Experimental Use*, 56 U. CHI. L. REV. 1017, 1072-73 (1989) (arguing that broad patent scope can have inefficient effects with respect to technological improvements); Mark A. Lemley, *The Economics of Improvement in Intellectual Property Law*, 75 TEX. L. REV. 989, 1048-72 (1997) (describing a model for the patent system that entitles an improver to a patent so long as the improvement is significant, even if it falls within the range of the original patent); Robert P. Merges, *Intellectual Property Rights and Bargaining Breakdown: The Case of Blocking Patents*, 62 TENN. L. REV. 75, 75-76 (1994) (discussing the "reverse doctrine of equivalents" as encouraging the voluntary licensing of patents for research towards their improvement); Robert P. Merges & Richard R. Nelson, *On the Complex Economics of Patent Scope*, 90 COLUM. L. REV. 839, 843-44 (1990) ("[T]he law should attempt at the margins to favor a competitive environment for improvements In many industries the efficiency gains from the pioneer's ability to coordinate are likely to be outweighed by the loss of competition for improvements to the basic invention.").

¹¹ *See infra* Parts II-III (expanding this argument).

¹² *See generally* Robert P. Merges, *Of Property Rules, Coase, and Intellectual Property*, 94 COLUM. L. REV. 2655, 2661 (1994) ("Although the overall goal of intellectual property law is often described in allocational efficiency terms (i.e., to increase economic output by overcoming market failures associated with the public goods quality of creative works), there is often an undercurrent of concern with the distribution of resources."); sources cited *supra* note 5 (criticizing the patent system's evaluation of patentability).

sults in confusion concerning potential infringement, and requires costly *ex post* generation of information, often as part of litigation.¹³ This is, above all, an informational problem—of timing, quality, and quantity. Importantly, the contemporaneous, patentee-provided information related to prosecution history (and induced by estoppel, as noted below) is likely to be the best possible source of information, and thus reveals the doctrine as critical to the informational challenges at the heart of the patent system.

The second insight supporting a reevaluation of prosecution history estoppel is that the potential for lost patent scope coverage (as a result of the application of prosecution history estoppel)¹⁴ generates incentives for the patentee to act in socially beneficial ways, such as: developing and disclosing additional information;¹⁵ seeking an appropriate amount of coverage, given the invention's significance;¹⁶ and enhancing the importance of the role of the United States Patent and Trademark Office (PTO), thus maintaining the institutional arrangements established by the patent system itself.¹⁷ The dual roles for prosecution history estoppel—providing information and creating incentives—directly support the patent administration system's goal of

¹³ See, e.g., Craig Allen Nard, *Certainty, Fence-Building, and the Useful Arts*, 74 IND. L.J. 759, 785-88 (1999) (noting the virtues of certainty in patent law); see also *Festo VII*, 122 S. Ct. at 1837 (noting the costs of uncertainty); Roger D. Blair & Thomas F. Cotter, *An Economic Analysis of Damages Rules in Intellectual Property Law*, 39 WM. & MARY L. REV. 1585, 1647-51 (1998) (“[T]he calculation of profits attributable to an infringement often will be a difficult task and very likely will involve some uncertainty in the estimation process.”); Robert P. Merges, *supra* note 12, at 2656-65 (discussing how difficulties of valuation and detection of externalities in the invention context lead to high transaction costs in the exchange of intellectual property rights).

¹⁴ See, e.g., *Festo VII*, 122 S. Ct. at 1838 (noting the scope-reducing effects of estoppel).

¹⁵ In this sense, prosecution history estoppel might be seen as a form of an information-forcing default penalty rule. See *infra* Part III.A (describing the information-forcing role of prosecution history estoppel); see also, e.g., Ian Ayres & Robert Gertner, *Filling Gaps in Incomplete Contracts: An Economic Theory of Default Rules*, 99 YALE L.J. 87, 91-95 (1989) (introducing the concept of “penalty defaults” designed to provide an incentive to at least one party of a contract to force affirmative terms that modify a default rule).

¹⁶ “Overclaiming”—the seeking of too-broad coverage given the significance of an invention—generates significant social costs. As discussed, *infra* Part III.B, a robust version of prosecution history estoppel, by raising the costs of overclaiming, encourages the patentee to claim appropriately at the outset.

¹⁷ Prosecution history estoppel “raises the stakes” of decisions made by the PTO, and thus encourages patentees to seriously assist the PTO in reaching correct decisions, and vigorously advocate (perhaps via an appeal to the U.S. Court of Appeals for the Federal Circuit) for their interests. See *infra* Part III.C (discussing how prosecution history estoppel can be viewed as a way to enforce the role of the PTO).

maintaining the relationship between innovation, disclosure, and patent scope. A robust theory of prosecution history estoppel, then, offers a significant contribution to the understanding and analysis of the modern patent system.

The theory of prosecution history developed by this Article greatly informs the continuing debate—recently illustrated by the series of *Festo* opinions¹⁸—concerning the specific form of the rule.¹⁹ Only a strong form of prosecution history estoppel—one that clearly reduces the potential scope of a patent when triggered—adequately supports the information-production and incentive-creation roles of the doctrine; weaker forms, including the Supreme Court’s “presumptive bar”²⁰ or the “foreseeable bar” rule offered as an intermediate position,²¹ fall well short of these goals.²² And yet the traditional analyses

¹⁸ The tortured path of the patent dispute between the *Festo* Corporation and SMC (as the defendant does business in the U.S.) is something of a metaphor for the debates surrounding prosecution history estoppel in recent years. In 1994, the U.S. District Court for the District of Massachusetts ruled in favor of *Festo* Corporation on the basis of both summary judgments and jury verdicts of infringement under the doctrine of equivalents, finding no prosecution history estoppel. See *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.* (“*Festo I Judgment*”), No. 88-1814-PBS, slip op. at 2-3 (D. Mass. Oct. 27, 1994) (entering a jury verdict of infringement under the doctrine of equivalents); *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.* (“*Festo I Order*”), No. 88-1814-PBS, slip op. at 14-15 (D. Mass. July 11, 1994) (granting summary judgment of infringement under the doctrine of equivalents).

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

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

¹⁹ See *infra* Part IV (describing the various potential forms of the estoppel rule).

²⁰ See *Festo VII*, 122 S. Ct. at 1842 (“[W]e hold here that the patentee should bear the burden of showing that the amendment does not surrender the particular equivalent in question.”).

²¹ See Conigliaro et al., *supra* note 8, at 1048 (suggesting a “foreseeable bar” that

of the doctrine, by failing to consider prosecution history estoppel in its broader role, have missed the opportunity to achieve the significant patent law reforms that this rule provides.

Finally, the Article's theoretical relocation of the classic doctrine of prosecution history estoppel within the system of incentives and strategic choices that drive patent administration is significant in an illustrative sense as well. The basic insight here—the benefits that flow from shifting the analytic focus from the doctrine as an *ex post* (after the patent issues) attempt to cabin patent scope to an instrumental tool with important *ex ante* effects—is generalizable. That is, features of the patent administration system make many of the doctrines particularly amenable to a similar form of exegesis, where a legal rule is evaluated by its impact on *ex ante* incentives rather than solely on the basis of *ex post* factors. Accordingly, the analysis here might be seen as a template, suggesting further avenues of inquiry across the patent law.

* * *

This Article moves in five parts. In Part I below, I introduce prosecution history estoppel, in particular exploring the incompleteness of the current equivalents-centered view. Here I note that contrary to common understanding, the information generated via the prosecution history process is widely used throughout the patent law, casting doubt on the narrow view of prosecution history estoppel as merely a limitation on patent scope. Further, the historical development of prosecution history estoppel does not support this equiva-

eliminates equivalents only to the extent that such a limitation of scope was foreseeable at the time amendment(s) were made).

²² Many readers will observe that the en banc majority of the Federal Circuit implemented a form of prosecution history estoppel like that advocated here. See, e.g., *Festo VI*, 234 F.3d at 564 (“[W]e hold that when a claim amendment creates prosecution history estoppel, no range of equivalents is available for the amended claim element.”). And yet the opinion by which the court explained its decision is based almost entirely upon an equivalents-centered view of prosecution history estoppel. See *Festo VI*, 234 F.3d at 575-78 (explaining that a strong form of prosecution history estoppel has the beneficial effects of limiting the scope of equivalents, providing notice and establishing certainty). Indeed, all of the major *Festo VI* opinions are equivalents-centered. See *id.* at 620-21 (Linn, J., concurring in part and dissenting in part) (“[T]he majority unfairly tips the balance away from patentees and toward competitors by constraining the legitimate rights of patentees to their inventions . . .”); *id.* at 641-42 (Newman, J., concurring in part and dissenting in part) (“The doctrine of equivalents has not been deemed superfluous as an instrument [of] justice, and not until today has it been deemed ‘unworkable’ by this court.”).

lents-centered view, as the rule is rooted in the concept of patent disclaimers rather than being associated with the doctrine of equivalents. And finally, I note that the logical bases of many of the objections to the strong form of prosecution history estoppel (as seen in the Supreme Court's *Festo VII* opinion) are unsatisfactory and based on fundamental misunderstandings of the real effect and nature of prosecution history estoppel.

In Part II, I begin to address the failures of the equivalents-centered view, noting the role of prosecution history in providing information crucial to the administration of the patent system. In doing so, I first trace the outlines of a model of patent administration, using both doctrine and theory to describe the central goal as maintaining the link between a proffered innovation, the disclosure provided by the patent document, and the scope of the patent grant. I note that underlying patent policy establishes the nature of this link; the task of the patent administration system is to maintain it. Doing so, I observe, involves acquiring deeply contextual information—of the sort that prosecution history (or, indeed, pre-prosecution information) is especially likely to provide. Thus, prosecution history information, being contemporaneous, patentee-provided, and especially relevant, plays a significant role in the administration of the patent system.

A second and perhaps even more important role for prosecution history estoppel is suggested in Part III: the creation of incentives. Building from the law and economics literature of default rules, I first argue that prosecution history estoppel is best viewed as an information-forcing penalty default rule. That is, the fact that the application of prosecution history estoppel can limit patent scope creates incentives for prospective patentees to avoid such a penalty by adjusting their behavior. These adjustments all result in the production of additional information—for example, conducting thorough prior art searches, claiming appropriately in light of the prior art, and limiting original claims to that supported by the disclosure—thus supporting the informational needs of the patent administration system identified in Part II. Relatedly, I identify a heretofore unremarked externality in the patent prosecution process: the shift in costs of information failures from prospective patentees to the public (usually in the form of the PTO). A robust version of prosecution history estoppel can address the prosecution externality by at least forcing patentees to consider the costs of information production during prosecution. Finally, I note that the meaningful application of prosecution history estoppel creates incentives for private parties to enforce the institutional ar-

rangements in the patent law—especially that between the PTO and the federal judiciary.

Part IV applies this theory of prosecution history estoppel to the debate relating to the specific form of estoppel. I argue that a strong form of estoppel—one that significantly limits the scope of the patent—dominates the so-called “flexible” versions. First, I note the strong form of estoppel, and its information-production and incentive-creation characteristics, works a significant reform to the patent law, neatly addressing many current criticisms of the patent system. Second, the choice between strong and flexible versions of estoppel is a debate about rules versus standards. The extensive literature concerning this debate, I argue, counsels in favor of a rule in this context. A clear rule will increase the learning effect of the legal regime (and thus increase compliance with the information-forcing aspects of estoppel). Further, a rule offers the patentee, in particular, the opportunity to meaningfully consider the costs and benefits of avoiding the penalty of estoppel. And third, I observe that the only actual empirical evidence about the success or failure of prosecution history estoppel rules comes from the Federal Circuit itself, the single organization with the most experience in applying estoppel. That the Federal Circuit determined that the flexible rules were unworkable, I suggest, is deeply significant.

Part V concludes the article by suggesting that although the recent *Festo* decisions best represent the failure of courts and commentators to fully address the importance of prosecution history estoppel to the patent administration system, there are potential avenues to pursue. In particular, I note that the Supreme Court’s “presumptive” form of prosecution history estoppel, while far from ideal, offers the Federal Circuit a range within which to apply the doctrine. The Federal Circuit should take advantage of this flexibility to vigorously apply prosecution history estoppel, seeking to achieve at least some of the benefits of the rule noted above. Finally, the significance of the analytic shift from *ex post* (after issue) to *ex ante* (before issue) is discussed, and further avenues of research suggested.

I. THE INCOMPLETE UNDERSTANDING OF PROSECUTION HISTORY ESTOPPEL

The “prosecution history” or “file wrapper” of an issued patent is the official record of proceedings in the United States Patent and

Trademark Office (PTO) related to the activities that prompted the issuance (or grant) of the patent.²³ As should be easily apparent, a patent's prosecution history will often contain amendments, clarifications, representations, and perhaps arguments by the inventor (or her representative) intended to persuade the PTO to grant the patent.²⁴ Thus, the typical doctrinal statement of prosecution history estoppel explains that it seeks to prevent the patentee from recovering any subject matter that was surrendered during prosecution.²⁵ Paradigmatically, if a patentee amends her claim during prosecution—say by changing a “three-legged stool” to “a three-legged stool with a sloped backrest,” perhaps to avoid prior art—then prosecution history estoppel will operate to prevent the patentee from asserting coverage over simple three-legged stools.²⁶ Similarly, if our patentee was to argue to

²³ See, e.g., *Standard Oil Co. v. Am. Cynamid Co.*, 774 F.2d 448, 452 (Fed. Cir. 1985) (“[T]he prosecution history . . . of the patent consists of the entire record of proceedings in the Patent and Trademark Office.”); PATENT & TRADEMARK OFFICE, U.S. DEP’T OF COMMERCE, MANUAL OF PATENT EXAMINING PROCEDURE § 719 (7th ed. 1998) (“The folder in which the [PTO] maintains the application papers is referred to as the [prosecution history].”). Professor Donald Chisum reports that the traditional term of reference was “file wrapper estoppel,” but that around 1983, the Federal Circuit “re-christened” the doctrine prosecution history estoppel. 5A DONALD S. CHISUM, CHISUM ON PATENTS: A TREATISE ON THE LAW OF PATENTABILITY, VALIDITY AND INFRINGEMENT § 18.05 (2002). For simplicity, the terms “prosecution history” and “prosecution history estoppel” will be used hereafter.

²⁴ [The prosecution history] includes all express representations made by or on behalf of the applicant to the examiner to induce a patent grant Such representations include amendments to the claims and arguments made to convince the examiner that the claimed invention meets the statutory requirements of novelty, utility, and nonobviousness.

Standard Oil Co., 774 F.2d at 452.

²⁵ See, e.g., *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 33, 40-41 (1997) (explaining that prosecution history is intended to limit the scope of equivalents); *Festo VI*, 234 F.3d at 564-65 (“The logic of prosecution history estoppel is that the patentee, during prosecution, has created a record that fairly notifies the public that the patentee has surrendered the right to claim particular matter as within the reach of the patent.”); *Pharmacia & Upjohn Co. v. Mylan Pharm., Inc.*, 170 F.3d 1373, 1376 (Fed. Cir. 1999) (“Prosecution history estoppel precludes a patentee from obtaining under the doctrine of equivalents coverage of subject matter that has been relinquished during the process of its patent application.”); *Sage Prods. v. Devon Indus., Inc.* 126 F.3d 1420, 1432 (Fed. Cir. 1997) (likening a patentee’s attempt to recover the coverage of a patent surrendered to an attempt to “retrade or renege on a deal struck with the PTO”); *Charles Greiner & Co. v. Mari-Med Mfg., Inc.*, 962 F.2d 1031, 1036 (Fed. Cir. 1992) (explaining that prosecution history estoppel “prevents the doctrine of equivalents from clashing with claim significance”); *Autogiro Co. v. United States*, 384 F.2d 391, 400 (Ct. Cl. 1967) (“The doctrine of equivalents is subservient to [prosecution history estoppel].”).

²⁶ This is an example of what might be called “estoppel by amendment.” See, e.g., *Keystone Driller Co. v. Northwest Eng’g Corp.*, 294 U.S. 42, 48 (1935) (“[W]here . . .

the examiner that her “three-legged stool” did not cover those made of stainless steel, then prosecution history estoppel would typically operate to prevent the later assertion of infringement against stainless steel stools.²⁷

Binding a patentee to her prosecution record, the argument goes, enhances and supports the “notice function” of the patent document,²⁸ preventing the public from being misled regarding the true nature and scope of the patent.²⁹

During the past several decades, the application of prosecution history estoppel has become unsettled.³⁰ The doctrine itself has been

broad claims are denied and narrower substituted, the patentee is estopped to read the granted claim as the equivalent of those which were rejected.”); *see also* 5A CHISUM, *supra* note 23, § 18.05[2][a] (listing relevant cases).

²⁷ This might be called estoppel by argument. *See, e.g.,* *Litton Sys. Inc. v. Honeywell, Inc.*, 140 F.3d 1449, 1462 (Fed. Cir. 1998) (“[A]n applicant’s arguments may constitute a clear and unmistakable surrender of subject matter. Such arguments preclude recapture of that subject matter.” (citation omitted)); *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 1460 (Fed. Cir. 1998) (en banc) (“The estoppel may arise . . . as a result of argument to secure allowance of a claim.”). Professor Chisum notes that this form of estoppel is relatively uncertain and largely confined to the Federal Circuit. 5A CHISUM, *supra* note 23, § 18.05[2][c]. However, given that the Federal Circuit explicitly approved this form of estoppel sitting en banc in *Cybor Corp.*, 138 F.3d at 1460, and is the sole appellate court for patent appeals, *see* 28 U.S.C. § 1295(a) (2000) (defining the jurisdiction of the Federal Circuit), these concerns seem unfounded in the modern era.

²⁸ *See Warner-Jenkinson*, 520 U.S. at 33 (noting “the role of claims in defining an invention and providing public notice”); *see also* 35 U.S.C. § 112 (2000) (requiring a patent to contain claims that “particularly point[] out and distinctly claim[] the subject matter which the applicant regards as his invention”).

²⁹ *See, e.g., Festo VI*, 234 F.3d at 564-65 (identifying one of the two principle functions of prosecution history estoppel as “preserving the notice function of claims”); *Charles Greiner & Co.*, 962 F.2d at 1036 (acknowledging that prosecution history estoppel “promotes certainty and clarity in determining the scope of patent rights”); *see also* 5A CHISUM, *supra* note 23, § 18.05[1] (citing public notice as a rationale for prosecution history estoppel).

³⁰ *See, e.g., Festo VI*, 234 F.3d at 565-91 (describing and characterizing the unsettled nature of the law); Conigliaro et al., *supra* note 8, at 1048 (evaluating as unworkable the approach of both the Federal Circuit and the Supreme Court with regard to prosecution history estoppel in *Festo*); Hantman, *supra* note 8, at 122 (“What remains of the doctrine is so vague that its effect on the interpretation and scope of claims cannot be determined until after a district court passes on the issue.”); Mueller, *supra* note 8, at 501-02 (concluding that the Supreme Court is “less than crystal clear” about the proper application and scope of prosecution history estoppel); Noe, *supra* note 8, at 11-12 (“Judicial concern continues regarding the doctrine’s potential to expand claims as well as its erosion of the notice function of claims.” (footnotes omitted)); Thomas, *supra* note 8, at 187 (setting out “to solve the puzzle of prosecution history”); Otterstedt, *supra* note 8, at 410-16 (addressing a perceived divide in the Federal Circuit between a flexible and strict bar on the doctrine of equivalents based on prosecution history); Note, *To Bar or Not to Bar: Prosecution History Estoppel After Warner-Jenkinson*, 111

virtually unquestioned,³¹ though its application along several dimensions has become inconsistent. Indeed, in an extraordinary step in the *Festo* case, the Federal Circuit outlined four distinct areas of confusion in the doctrine that it wished the parties (and amici) to consider³² and later decided each question en banc.³³

This unraveling of the doctrine of prosecution history estoppel might be explained as simply a function of the complexity of the required analysis: a process that requires the court³⁴ to analyze whether the patentee discussed or amended the key element or elements of the patent, whether that discussion constituted a surrender of relevant subject matter, and whether the relinquishment has a bearing on the infringement issue at hand.³⁵ To be sure, that must be part of the equation. But an even more apt story can be told here: The confu-

Harv. L. Rev. 2330, 2330-31 (1998) (considering the inconsistent manner in which the prosecution history is applied).

³¹ Cf. *Warner-Jenkinson*, 520 U.S. at 30 (describing the continuing vitality of prosecution history estoppel). Note that none of the commentary cited *supra* note 30 advocates the elimination of the doctrine.

³² See *Festo V*, 187 F.3d 1381, 1381-82 (Fed. Cir. 1999) (en banc) (ordering the submission of briefs directed at prosecution history estoppel in light of *Warner-Jenkinson*). The four areas identified by the Federal Circuit were: (1) whether an applicant's argument relating to other-than-prior-art issues was relevant for prosecution history estoppel; (2) whether a "voluntary" amendment or argument (i.e., one unprompted by examiner action) could trigger estoppel; (3) the scope of the doctrine of equivalents remaining (if any) if estoppel applies to a claim element; and (4) the scope of the doctrine of equivalents remaining (if any) in the event that the applicant cannot establish a reason for the amendment. *Id.* The court also ordered briefing on a fifth question, relating to the "all-elements-rule" and its applicability to the case at hand. *Id.* The fifth question did not implicate prosecution history estoppel and was not answered by the court. See *Festo VI*, 234 F.3d at 587 ("[W]e do not reach the 'all elements' rule.").

³³ The Federal Circuit answered the "four questions" in the following way: (1) any amendment or argument relating to the patentability of an invention is relevant for estoppel; (2) voluntary amendments can and do trigger estoppel; (3) if estoppel applies, the scope of the equivalents is zero; and (4) if no reason for an amendment or argument is established, the scope of the equivalents is zero. *Festo VI*, 234 F.3d at 565-87.

³⁴ Prosecution history estoppel is considered an issue of law. See, e.g., *Warner-Jenkinson*, 520 U.S. at 39 n.8 (explaining that such limitations on the application of the doctrine of equivalents are judgments to be rendered by the court as a matter of law).

³⁵ And after *Festo VII*, the court must also determine whether the amendment to the claims "can[] reasonably be viewed as surrendering a particular equivalent." 122 S. Ct. at 1842; cf. *Warner-Jenkinson*, 520 U.S. at 31-33 ("Our prior case law consistently applied prosecution history estoppel only when claims have been amended for a limited set of reasons . . ."). But see *Festo VI*, 234 F.3d at 564-65 ("[W]e hold that 'unexplained' amendments are not entitled to any range of equivalents."). For a discussion of the complexity in determining the applicability of the doctrine, see 5A CHISUM, *supra* note 23, § 18.05[2]-[3]; Note, *supra* note 30, at 2331-32 (same).

sion and uncertainty in prosecution history estoppel is an unfortunate byproduct of the rule's direct association (in the traditional view) with the "doctrine of equivalents," a judicially crafted scheme that allows patentees to expand the scope of the patent grant to cover "equivalents" to the claimed invention.³⁶ Through its entanglement with the

³⁶ The classic justification for the doctrine of equivalents is found in *Graver Tank & Manufacturing Co. v. Linde Air Products Co.*, 339 U.S. 605 (1950):

[C]ourts have also recognized that 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. Such a limitation would leave room for—indeed encourage—the unscrupulous copyist to make unimportant and insubstantial changes and substitutions in the patent which, though adding nothing, would be enough to take the copied matter outside the claim, and hence outside the reach of law. One who seeks to pirate an invention, like one who seeks to pirate a copyrighted book or play, may be expected to introduce minor variations to conceal and shelter the piracy. Outright and forthright duplication is a dull and very rare type of infringement. To prohibit no other would place the inventor at the mercy of verbalism and would be subordinating substance to form. It would deprive him of the benefit of his invention and would foster concealment rather than disclosure of inventions, which is one of the primary purposes of the patent system.

The doctrine of equivalents evolved in response to this experience. The essence of the doctrine is that one may not practice a fraud on a patent "To temper unsparing logic and prevent an infringer from stealing the benefit of an invention" a patentee may invoke this doctrine to proceed against the producer of a device "if it performs substantially the same function in substantially the same way to obtain the same result."

Id. at 607-08 (quoting *Sanitary Refrigerator Co. v. Winters*, 280 U.S. 30, 42 (1929)).

As might be imagined, there have been dissenters throughout—as exemplified by Judge Learned Hand, writing in 1929:

It is plain that [the doctrine of equivalents] violates in theory the underlying and necessary principle that the disclosure is open to the public save as the claim forbids, and that it is the claim and that alone which measures the monopoly On the one hand, therefore, the claim is not to be taken at its face—however freely construed—but its elements may be treated as examples of a class which may be extended more or less broadly as the disclosure warrants, the prior art permits, and the originality of the discovery makes desirable. On the other, it is not to be ignored as a guide in ascertaining those elements of the disclosure which constitute the "invention," and without which there could be no patent at all. It is obviously impossible to set any theoretic limits to such a doctrine, which indeed its origin forbids, since it is in misericordiam to relieve those who have failed to express their complete meaning. Somewhat the same process is indeed inherent in the interpretation of any verbal expression, and perhaps the best that can be said is that in the case of patent claims much greater liberties are taken than would be allowed elsewhere. Each case is inevitably a matter of degree, as so often happens, and other decisions have little or no value. The usual ritual, which is so often repeated and which has so little meaning, that the same result must follow by substantially the same means, does not help much in application; it is no more than a way of stating the problem. Any decision is therefore bound

doctrine of equivalents, the conventional view of prosecution history estoppel has lost sight of any independent role that estoppel might play in the wider patent administration system. Further, by association with the doctrine of equivalents, prosecution history estoppel has become “caught up” in a variety of jurisprudential debates and controversies in which the proper function of estoppel has been considered out of context, if at all.³⁷ For example, in the recent jurisprudential debates in the *Festo* series of decisions, the doctrine of prosecution history estoppel was universally invoked as a limit on the breadth of the doctrine of equivalents—rather than as an important component in the patent administration system.³⁸ Similarly, the academic commentary

to have an arbitrary color, as in all close cases of interpretation, and it is difficult to give it greater authority than an appeal to the sympathetic understanding of an impartial reader.

Claude Neon Lights v. E. Machlett & Son, 36 F.2d 574, 575-76 (2d Cir. 1929) (citations omitted). Even the recent Supreme Court—while affirming the continued existence and vitality of the doctrine prior to *Festo VII*—expressed “concern . . . that the doctrine of equivalents . . . has taken on a life of its own, unbounded by the patent claims. 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.” *Warner-Jenkinson*, 520 U.S. at 28-29.

³⁷ As I note in the Introduction, *supra*, the *Festo* decisions (and arguments) are a case study in this failure to address the role of prosecution history estoppel.

³⁸ See *Festo VII*, 122 S. Ct. at 1839 (“Prosecution history estoppel ensures that the doctrine of equivalents remains tied to its underlying purpose.”); *Festo VI*, 234 F.3d at 558 (“Prosecution history estoppel is one tool that prevents the doctrine of equivalents from vitiating the notice function of claims.”); *id.* at 592 (Plager, J., concurring) (describing estoppel as a limit on the doctrine of equivalents); *id.* at 600 (Michel, J., concurring in part and dissenting in part) (same); *id.* at 620-22 (Linn, J., concurring in part and dissenting in part) (same); *id.* at 630 (Newman, J., concurring in part and dissenting in part) (same).

Note that all of the thirty-one briefs filed with the Supreme Court in the *Festo* case described prosecution history estoppel as nothing more than a way of limiting the doctrine of equivalents. Reply Brief for Petitioner at 1, *Festo VII* (No. 00-1543) (“[P]rosecution history estoppel prevents a patentee from deliberately relinquishing subject matter by amending his application in order to obtain a patent and later invoking the doctrine of equivalents to reclaim the surrendered subject matter.”), available at 2001 WL 1548695; Brief of Amici Curiae IBM Corp. et al. at 6-7 (arguing that the flexible approach of prosecution history estoppel is flawed because it leaves the scope of the patent uncertain), available at 2001 WL 1397747; Brief of Amici Curiae Applera Corp. et al. at 6-8 (describing the purpose of prosecution history estoppel as establishing an accurate measure of what the applicant surrendered in the patent application process), available at 2001 WL 1548692; Brief of Amici Curiae Intel Corp. et al. at 3-5 (framing prosecution history estoppel as functioning with twin aims: “[T]o promote efficiency and innovation by increasing the clarity and predictability of patents’ scope, and to promote fairness by binding patentees to concessions they make before the PTO.”), available at 2001 WL 1576083; Brief of Amicus Curiae American Intellectual Property Law Association at 2 (considering prosecution history estoppel in terms of its “effect on the corresponding application of the doctrine of equivalents”), available at

2001 WL 1025096; Brief of Amicus Curiae Patent, Trademark & Copyright Section of the Bar Association of the District of Columbia at 2 (“[C]larification of the scope and extent of [prosecution history estoppel] will help the resolution of all doctrine of equivalents cases . . .”), *available at* 2001 WL 1025555; Brief of Amicus Curiae American Bar Association at 2-4 (criticizing a complete bar rule as “all but abolish[ing] the doctrine of equivalents”), *available at* 2001 WL 1024048; Brief of Amicus Curiae Celltech Group PLC at 2-4 (highlighting how a complete bar rule in the biotechnology context allows copyists to avoid liability by cutting off the doctrine of equivalents from application to insignificant changes), *available at* 2001 WL 1025107; Brief of Amicus Curiae United States at 9 (“[P]rosecution history estoppel remains an important limitation on the role of [the doctrine of equivalents].”), *available at* 2001 WL 1025650; Brief of Amicus Curiae Chiron Corp. at 2-5 (describing how *Festo VI* threatens the protection of biotechnology patents secured through the doctrine of equivalents), *available at* 2001 WL 1025109; Brief of Amici Curiae Wisconsin Alumni Research Foundation et al. at 6-7 (arguing that a complete bar denies protection under the doctrine of equivalents based on the qualitative value of the patent which the courts historically have considered), *available at* 2001 WL 1056915; Brief of Amicus Curiae National Intellectual Property Law Institute at 1-2 (calling the estoppel doctrine forwarded by the Federal Circuit in *Festo VI* a “radical departure” undermining valid property rights of patent holders through equivalencies), *available at* 2001 WL 1025514; Brief of Amicus Curiae Consumer Project on Technology at 2-3 (describing the function of prosecution history estoppel as “prevent[ing] resort to the ‘doctrine of equivalents’ to reclaim any subject matter disclaimed by the amendment”), *available at* 2001 WL 1397746; Brief of Amicus Curiae Genentech, Inc. at 2-3 (calling *Festo VI* a movement towards “clarity and legal certainty” with respect to the doctrine of equivalents), *available at* 2001 WL 1480572; Brief of Amicus Curiae MedImmune, Inc. at 2-3 (criticizing the amicus brief of Celltech), *available at* 2001 WL 1548693; Brief of Amicus Curiae Litton Systems, Inc. at 8 (arguing that *Festo VI* divested patent holders of property rights secured by the doctrine of equivalents), *available at* 2001 WL 1002689; Brief of Amicus Curiae Houston Intellectual Property Law Association at 14-15 (“[T]he doctrine of prosecution history estoppel acts as a check on the reach of the doctrine of equivalents . . .”), *available at* 2001 WL 1025169; Brief of Amicus Curiae Philadelphia Intellectual Property Law Association at 2 (claiming that the “full scope of the invention” cannot be protected under the limited range of equivalents established by *Festo VI*), *available at* 2001 WL 1025603; Brief of Amicus Curiae ASTA Medica Aktiengesellschaft at 3 (pointing out that the delimited version of equivalents set forth in *Festo VI* undermines efforts to harmonize global intellectual property protection), *available at* 2001 WL 1025099; Brief of Amicus Curiae National Bar Association at 3 (“Prosecution history estoppel operates to prevent an overly broad application of the doctrine of equivalents . . .”), *available at* 2001 WL 1025444; Brief of Amicus Curiae Bose Corp. at 1-2 (stating that the Federal Circuit ignored *Warner-Jenkinson* by expanding estoppel with the effect of upsetting expectations of patent holders), *available at* 2001 WL 1040335; Brief of Amicus Curiae Federal Circuit Bar Association at 1-3 (arguing that a complete bar violates a general tenet that the scope of estoppel limiting a patent should relate to the conduct giving rise to it), *available at* 2001 WL 1025114; Brief of Amici Curiae Intellectual Property Creators et al. at 3-4 (discussing how the limits to the doctrine of equivalents instituted by *Festo VI* will harm small inventors), *available at* 2001 WL 1025252; Brief of Amicus Curiae Institute of Electrical and Electronics Engineers at 3 (accusing the Federal Circuit’s absolute bar rule of sacrificing the protective function of patents), *available at* 2001 WL 1025309; Brief of Amici Curiae Minnesota Mining and Manufacturing Co. et al. at 4 (stating that *Festo VI* “eliminates resort to the doctrine of equivalents”), *available at* 2001 WL 1025380; Brief for Petitioner at 16 (“Under the his-

relating to the *Festo* decisions has considered only the scope of the doctrine of equivalents rather than the role of prosecution history estoppel.³⁹

This uncritical focus on the doctrine of equivalents is, quite frankly, puzzling. An exclusive relationship between prosecution history estoppel and the doctrine of equivalents is neither commanded by the doctrine itself, nor well-supported by the historical record. Indeed, case law reveals that information produced during and before prosecution informs almost every important inquiry in patent law, including claim construction and validity analyses. Similarly, the historical roots of prosecution history estoppel predate the emergence of the doctrine of equivalents, and are based on theories of disclaimer

toric understanding, prosecution history estoppel limits the doctrine of equivalents . . .”), available at 2001 WL 1025738; Brief of Amicus Curiae Fédération Internationale Des Conseils en Propriété Industrielle at 4 (asserting that the complete bar violates U.S. obligations to the international community to provide proper remedies and deterrence from patent infringement), available at 2001 WL 1025117; Brief of Amicus Curiae Sean Patrick Suiter at 17 (“[T]he doctrine of prosecution history estoppel precludes a patent owner from obtaining a claim construction which resurrects subject matter surrendered during prosecution.”), available at 2001 WL 995289; Brief of Amicus Curiae Vincent P. Tassinari at 4 (“[P]rosecution history estoppel places [the] doctrine of equivalents within the structure of the Patent Act and places reasonable limits on the doctrine.”), available at 2001 WL 995291.

³⁹ See, e.g., Conigliaro et al., *supra* note 8, at 1047 (“Prosecution history estoppel prevents patentees from relying on the doctrine of equivalents to broaden their patents in ways that are inconsistent with the amendments or arguments they made to the [PTO] . . .”); Peter Corcoran, *The Scope of Claim Amendments, Prosecution History Estoppel, and the Doctrine of Equivalents After Festo VI*, 9 TEX. INTELL. PROP. L.J. 159, 166 (2001) (interpreting the significance of *Festo VI* as serving a patent notice function to the public by viewing amendments as an announcement of the patent scope on which the public can rely); Michael O. Sutton & Christopher G. Darrow, *Recent Developments in Patent Law*, 9 TEX. INTELL. PROP. L.J. 429, 430 (2001) (“[In *Festo VI*,] the Federal Circuit decided . . . that a patentee is not entitled to rely upon the doctrine of equivalents to prove infringement of a particular element, if that element has been narrowed for any purposes related to patentability during the prosecution history.”); Jacob S. Wharton, *Festo and the Complete Bar: What’s Left of the Doctrine of Equivalents?*, 20 ST. LOUIS U. PUB. L. REV. 281, 282 (2001) (“The *Festo* decision tackles the multi-faceted doctrine of equivalents . . .”); Marc S. Hanish & Adrienne Yeung, *Patent Practitioners Beware: The Federal Circuit Releases a Manifesto*, NEV. LAW., Mar. 9, 2001, at 18, 21 (explaining how *Festo VI* most affects patent prosecutors who must now “see into the future and determine all the possible equivalents” because of the complete bar); Janice M. Mueller, *Festo Presto! The Incredible Disappearing Doctrine of Equivalents*, NEWS SOURCE (J. Marshall L. Sch. Ctr. Intell. Prop. L., Chicago, Ill.), Winter 2001, at 8 (contending that *Festo VI* promulgated a “rule that fundamentally contracts the availability of the venerable patent law doctrine of equivalents”).

and reliance, rather than affirmative limitations on the scope of patent rights.⁴⁰

A. *The Universality of Prosecution History Analysis*

In contrast to the narrow and wooden view of prosecution history estoppel commonly advanced by courts and commentators, it is unquestionable that a patent's prosecution history is relevant across a wide range of critical analyses. Note here that I conflate what many might view as two separate concepts: (a) prosecution history *estoppel*; and (b) prosecution history *information* (or information generated during, or perhaps before, the prosecution of the patent). Yet from an informational perspective, the two are indistinct; the application of prosecution history estoppel requires the analysis of particular prosecution history information.⁴¹ That an "estoppel" rule has only been applied to the doctrine of equivalents is no more a difference: as noted below, prosecution history information can affect claim scope in claim interpretation under virtually identical principles.⁴² Thus, a first task here is to look beyond the illusory nomenclature and consider the array of information conveyed by prosecution history.

1. Claim Interpretation

Perhaps the best-known use of prosecution history information (aside from the "limitation on the doctrine of equivalents" view noted above) is in determination of the appropriate meaning of claims. Thus, in *Desper Products, Inc. v. QSound Labs, Inc.*,⁴³ the Federal Circuit offered controlling weight to arguments made by the patentee during prosecution, noting that "the public has the right to rely on the applicants' remarks in seeking allowance of their claims,"⁴⁴ and that "[p]rosecution history is an important source of . . . evidence in interpreting claims because it is a contemporaneous exchange between the

⁴⁰ Cf. *infra* Part II.B (linking prosecution history estoppel with the doctrine of equivalents).

⁴¹ See, e.g., *Festo VII*, 122 S. Ct. at 1835 ("Warner-Jenkinson acknowledged that competitors may rely on the prosecution history, the public record of the patent proceedings.")

⁴² See, e.g., *Desper Prods., Inc. v. QSound Labs, Inc.*, 157 F.3d 1325, 1336-37 (Fed. Cir. 1998) (interpreting language of several patents based on their prosecution history).

⁴³ *Id.*

⁴⁴ *Id.* at 1337.

applicant and the examiner.”⁴⁵ This use of prosecution history as a guide to claim construction has become commonplace, leading Professor Thomas to describe the trend as “increasing[ly] vigor[ous].”⁴⁶

Without a doubt, the prosecution history of a patent may not (and perhaps should not) be dispositive of all interpretive tasks. Patent law clearly mandates the primacy of the claims, and to a lesser degree, the specification.⁴⁷ And yet this does not diminish the fact that the patent

⁴⁵ *Id.* at 1336-37.

⁴⁶ Thomas, *supra* note 8, at 186. Thomas decries this trend, arguing that the use of prosecution histories are, generously, second-best as a mechanism for accounting for the prior art approach, which he suggests is the only satisfactory explanation for their use. *Id.* at 216-28. While I share some of Professor Thomas’s concerns about the potential inaccuracies of prosecution history and the PTO’s laxity in ensuing accurate compilation and maintenance of these records, *see id.* at 186-87 (“Patent Office generation of [prosecution histories] remains uneven, often leaving surprising gaps . . .”), the fact remains that the patentee will often be the single person (or entity) most able to generate relevant information concerning the relationship between the claimed invention, the prior art, and the patent disclosure. *See infra* Part III.A (expanding this argument). Thus, while Thomas is right that the claims should clearly dominate any interpretive hints drawn from the prosecution history, this acknowledgement need not deny the value of precise contemporaneous information that might, in some cases, offer the courts the ability to reach an appropriate interpretive result. Indeed, Thomas himself argues that claim language can, and must, be read in the context of the specification, because the specification provides detailed, statutorily mandated information concerning the invention. *See* Thomas, *supra* note 8, at 212-13 (comparing specification to a statute’s legislative history, both of which are important interpretive tools). Yet to the extent that further information is needed and available—say, for example, the relationship between the invention and a key piece of prior art, or the view of the patentee concerning the definition of a particular claim term in light of the enablement requirement—it seems illogical to forbid decision makers from reviewing it. To say that invalidity attaches where additional information is required beyond the specification is no answer: in both of the examples above, the non-use of the contemporaneous information will not necessarily invalidate the patent, but merely increase the likelihood of an incorrect interpretive decision, thus throwing into doubt the patent system’s link between innovation, disclosure, and patent scope.

Thomas’s concerns about the use of prosecution history are thus better viewed as being directed to the lack of clear and consistent processes by which the courts weigh respective information sources in claim interpretation. If, as Thomas persuasively argues, there are strong reasons to believe on the whole that the claims and, perhaps, the specification will be the most reliable sources of interpretive correctness, *see id.* at 229 (“[N]o compelling need exists for resort to prosecution histories during claim interpretation . . .”), then the court should clearly delineate the circumstances under which resort to non-patent information sources is acceptable. The Federal Circuit has attempted to do so. *See, e.g., Johnson Worldwide Assocs., Inc. v. Zebco Corp.*, 175 F.3d 985, 989-90 (Fed. Cir. 1999) (specifying the circumstances under which the specification and the prosecution history may be used interpretively). Though the results have not been uniformly lauded. *See, e.g., K-2 Corp. v. Salomon S.A.*, 191 F.3d 1356, 1370 (Fed. Cir. 1999) (Rader, J., dissenting) (“Divorced from context, words lose their ordinary and accustomed meanings.”).

⁴⁷ *See* 35 U.S.C. § 112, paras. 1-2 (2000) (mandating and defining the claim and

law has long recognized the value of prosecution history—contemporaneous, patentee-provided information.⁴⁸

2. Invalidity

Whether a patent is deemed invalid by a court will be influenced by its prosecution history.⁴⁹ First, to the extent that such information illuminates claim construction, it will likewise factor heavily into an invalidity analysis. In this vein, the Supreme Court has held that a patentee who surrenders a narrowly drawn claim in favor of a broader version may not later “fall back” to the narrow position in response to a validity challenge.⁵⁰ Again, the law recognizes that the patentee is often the best (or only) source of contemporaneous information on these issues, and has responded accordingly.

specification); *see also supra* note 46 (citing Federal Circuit precedent on the primacy of claims in interpretation).

⁴⁸ At times, various panels of the Federal Circuit have sought to “distinguish” between prosecution history estoppel as it applies to the doctrine of equivalents and the use of prosecution history to interpret claim terms. *See, e.g., Southwall Techs., Inc. v. Cardinal IG Co.*, 54 F.3d 1570, 1578 (Fed. Cir. 1995) (“Claim interpretation in view of the prosecution history is a preliminary step in determining literal infringement, while prosecution history estoppel applies as a limitation on the range of equivalents . . .”); *Read Corp. v. Portec, Inc.*, 970 F.2d 816, 823 (Fed. Cir. 1992) (disentangling “the two concepts”); *Johnston v. IVAC Corp.*, 885 F.2d 1574, 1578-79 (Fed. Cir. 1989) (establishing the scope of a patent based on prosecution history as a means to interpret a claim as opposed to a form of estoppel). Such efforts do little more than simply point out the differences between claim construction and the analysis of the scope of equivalents. To be sure, the use of prosecution history in claim construction more directly implicates literal infringement than infringement under the doctrine of equivalents. This, of course, is the point: prosecution history is recognized as being relevant in a wide variety of contexts beyond the doctrine of equivalents.

⁴⁹ Patents, while presumed valid by statute, 35 U.S.C. § 282 (2000), can be declared invalid by a federal court, *id.* § 282(2). The presumption of validity requires clear and convincing evidence of *invalidity*. *See, e.g., Ultra-Tex Surfaces, Inc v. Hill Bros. Chem. Co.*, 204 F.3d 1360, 1367 (Fed. Cir. 2000) (“An accused infringer alleging that a claim is invalid must overcome the statutory presumption of validity that attaches to an issued by proving invalidity by facts supported by clear and convincing evidence.” (citation omitted)).

⁵⁰ *See, e.g., Schriber-Schroth Co. v. Cleveland Trust Co.*, 311 U.S. 211, 221 (1940) (“The patentee may not, by resort to the doctrine of equivalents, give to an allowed claim a scope which it might have had without the amendments, the cancellation of which amounts to a disclaimer.”); *Morgan Envelope Co. v. Albany Perforated Wrapping Paper Co.*, 152 U.S. 425, 429 (1894) (holding the patentee “estopped” from seeking to reduce his claim scope by argument to a claim that he abandoned during prosecution).

Second, certain patentability requirements, such as the rule that “new matter” may not be added to a patent’s disclosure,⁵¹ explicitly invoke the patent’s prosecution history. This question arises in the context of determining whether a particular claim is entitled to a corresponding filing date; § 112 requires full descriptive support for every claim.⁵² Thus, the interplay between the disclosure requirement and the prohibition on new matter often requires a detailed analysis of precisely when certain information was added to a specification—a process that is described as “difficult” and “laborious,”⁵³ but one that the law nonetheless values.⁵⁴

3. Inequitable Conduct

Professor Thomas notes yet another clear doctrinal role that prosecution history plays in the patent law—the determination of inequitable conduct.⁵⁵ Inequitable conduct is derived from the equitable doctrine of unclean hands,⁵⁶ and holds unenforceable a patent obtained through bad behavior at the Patent Office.⁵⁷ As should be immediately apparent, the analysis of inequitable conduct is entirely based upon the prosecution record. This use of prosecution history information, however, is not the same as those uses relating to the

⁵¹ 35 U.S.C. § 132(a) (2000) (“No amendment shall introduce new matter into the disclosure of the invention.”).

⁵² 35 U.S.C. § 112, para. 1 (2000) (stating the enablement and written description requirements).

⁵³ Thomas, *supra* note 8, at 231.

⁵⁴ See, e.g., *Vas-Cath Inc. v. Mahurkar*, 935 F.2d 1555, 1560-64 (Fed. Cir. 1991) (reviewing the assertion that patents should be disallowed a certain filing date for lack of “adequate ‘written description’ to the claimed invention” (citation omitted)).

⁵⁵ See Thomas, *supra* note 8, at 232-34 (“[R]eliance on the prosecution history is the doctrine of inequitable conduct.”).

⁵⁶ See *Precision Inst. Mfg. v. Auto. Maint. Mach. Co.*, 324 U.S. 806, 814-15 (1945) (noting the equitable origins of “unclean hands”).

⁵⁷ See, e.g., *PerSeptive Biosystems, Inc. v. Pharmacia Biotech, Inc.*, 225 F.3d 1315, 1322 (Fed. Cir. 2000) (focusing on the issue of materiality with respect to false dealings); *Baxter Int’l, Inc. v. McGaw, Inc.*, 149 F.3d 1321, 1327 (Fed. Cir. 1998) (analyzing an accusation of inequitable conduct in the two steps of determining the materiality of the behavior and its culpability); *Nobelpharma AB v. Implant Innovations, Inc.* 141 F.3d 1059, 1069-70 (Fed. Cir. 1998) (describing the foundations of inequitable conduct as a defense against assertions of patent infringement); *J.P. Stevens & Co. v. Lex-Tex Ltd.*, 747 F.2d 1553, 1561 (Fed. Cir. 1984) (rendering a patent unenforceable based on inequitable conduct). Typically, the “bad behavior” involves the hiding or non-citation of relevant prior art, but occasionally it can include misinformation related to inventorship and other requirements for patentability. See, e.g., *PerSeptive Biosystems*, 225 F.3d at 1321-22 (invalidating a patent on grounds of misstatements to a patent examiner).

doctrine of equivalents, claim construction, or invalidity. Investigating inequitable conduct does not provide additional contemporaneous information related to the relationship between innovation, disclosure, and patent scope; instead, it simply provides information related to the patentee's (or her representative's) behavior before the Patent Office. Therefore, while inequitable conduct is clearly another doctrine that considers prosecution history—and thus supports the proposition that the myopic equivalents-centered view of prosecution history is incomplete—it is perhaps less surprising that such a role is often overlooked.

In sum, it simply cannot be denied that prosecution history—that is, contemporaneous, patentee-generated information—is a significant component of other doctrinal elements of the patent law. The equivalents-centered view of prosecution history estoppel, then, misrepresents legal reality. The Article next turns to the historical roots of prosecution history estoppel, suggesting that the equivalents-centered view is inaccurate along that dimension as well.

B. *The Historical Roots of Prosecution History Estoppel*

While it is beyond the scope of this Article to provide a comprehensive historical account of the developments of prosecution history estoppel and the doctrine of equivalents, a few notes and observations are in order.

First, it appears that the concept of prosecution history estoppel originated from the concepts of disclaimers and reissues. Under the patent law of 1836 (and prior to that in some circumstances), a patentee could amend her patent by seeking a reissue—a legal “do-over” intended to allow patentees to save their patents when they discovered potential invalidity problems.⁵⁸ This rule worked only in one direction—a reissue could claim less than what was claimed in the original patent,⁵⁹ but could not expand on claims from the original.⁶⁰ Another

⁵⁸ See GEORGE TICKNOR CURTIS, A TREATISE ON THE LAW OF PATENTS FOR USEFUL INVENTIONS §§ 279-282 (4th ed. 1873). The reissue continues to exist today in only slightly modified form—the major change being that reissued patents may, in some cases, have broader claims than the original. See 35 U.S.C. §§ 251-252 (2000) (outlining reissues of defective patents).

⁵⁹ See CURTIS, *supra* note 58, § 283; see also *Carver v. Braintree Mfg. Co.*, 5 F. Cas. 235, 238 (C.C.D. Mass. 1843) (No. 2485) (Story, Circuit Justice) (“[A]n inventor is always at liberty to omit a part of his original invention, if he deems it expedient, and to retain that part only of his original invention which he deems fit to retain.”).

⁶⁰ See CURTIS, *supra* note 58, § 282. One interesting exception to this rule is found in *Morey v. Lockwood*, 75 U.S. (8 Wall.) 230 (1868), in which the court held that if the

way that a patentee could amend his patent was to file a disclaimer with the patent office. Such an act ceded any claim of rights over subject matter that the patent could not legally cover (for example, because it was not new), and served to save the patent from invalidation.⁶¹ The roots of the prosecution history estoppel doctrine in the concept of disclaimers and reissues are clearly observable in the cases that first link those concepts to instances of surrender.

Perhaps the earliest clear statement of a prosecution history estoppel is *Leggett v. Avery*:

If, in any case, where an applicant for letters-patent, in order to obtain the issue thereof, disclaims a particular invention, or acquiesces in the rejection of a claim thereto, a reissue containing such claim is valid (which we greatly doubt), it certainly cannot be sustained in this case. The allowance of claims once formally abandoned by the applicant, in order to get his letters-patent through, is the occasion of immense frauds against the public. . . . As before remarked, we consider it extremely doubtful whether reissued letters can be sustained in any case where they contain claims that once have been formally disclaimed by the patentee, or rejected with his acquiescence, and he has consented to such rejection in order to obtain his letters-patent.⁶²

While *Leggett* links the import of prosecution history to reissues, *Sergeant v. Hall Safe & Lock Co.* links the concept more directly to disclaimers: "In patents for combinations of mechanism, limitations and provisos, imposed by the inventor, especially such as were introduced into an application after it had been persistently rejected, must be strictly construed, against the inventor, and in favor of the public, and looked upon as in the nature of disclaimers."⁶³

The development continued from there. *Leggett* and *Hall Safe & Lock*, among others, are cited in *Shepard v. Carrigan* for the proposition that:

Where an applicant for a patent to cover a new combination is compelled by the rejection of his application by the Patent Office to narrow his claim by the introduction of a new element, he cannot after the issue

Commissioner had rejected a claim in error, the patentee could get a reissue containing the rejected claim. This might cast doubt upon theories of prosecution history estoppel grounded in administrative exhaustion. See, e.g., 5A CHISUM, *supra* note 23, § 18.05[1][c] (collecting cases addressing the exhaustion of administrative remedies); Thomas, *supra* note 8, at 205 (concluding that courts should respect the determinations of patent examiners instead of second-guessing through prosecution history analysis).

⁶¹ See CURTIS, *supra* note 58, § 286.

⁶² 101 U.S. 256, 259-60 (1879).

⁶³ 114 U.S. 63, 86 (1885).

of the patent broaden his claim by dropping the element which he was compelled to include in order to secure his patent.⁶⁴

Shepard was in turn cited in *Sutter v. Robinson* for the proposition that the patentee “is not at liberty now to insist upon a construction of his patent which will include what he was expressly required to abandon and disavow as a condition of the grant.”⁶⁵

Importantly, this chain of foundational cases—*Leggett, Hall Safe & Lock, Shepard*, and *Sutter*—are not exclusively concerned with the doctrine of equivalents. *Leggett* and *Hall Safe & Lock* raise the issue of claim construction rather than infringement by equivalents. *Shepard* is somewhat less clear, and hints that the basis for the infringement claim might be the doctrine of equivalents.⁶⁶ *Sutter* addressed an infringement dispute over devices that “resweated” dried tobacco, using a steaming apparatus that included tanks, boilers, and wooden tobacco containers. The only difference between the patented and accused device was that the accused infringer used tobacco shipping vessels rather than purpose-built wooden boxes, resulting in a far less “tight” enclosure for the tobacco.⁶⁷ Importantly, the Court determined that—due to prosecution history information—the patent could not, as a matter of construction, cover anything more than the wooden container.⁶⁸ Because the use of shipping vessels as containers for resweating tobacco was known in the prior art, infringement was precluded.⁶⁹ Thus, *Sutter* features prosecution history as the determinant of the relationship between the claimed invention, the disclosure, and the prior art—not solely as a legal limitation on the scope of the doctrine of equivalents.

⁶⁴ 116 U.S. 593, 597 (1886).

⁶⁵ 119 U.S. 530, 541 (1886) (citation omitted).

⁶⁶ See 116 U.S. at 597 (describing the material elements of a claim). *But see id.* at 597 (“[T]he file-wrapper and contents of which we have stated the substance, make it clear that the claim and specification of the . . . patent must be construed to include, as their language requires, a fluted or plaited band or border as one of the essential elements of the invention.” (emphasis added)).

⁶⁷ See 119 U.S. at 535 (reviewing the finding of the appellate court regarding the differences between the devices).

⁶⁸ As the Court explained:

A comparison of the patent as granted with the application very conclusively establishes the limits within which the patentee's claims must be confined. He is not at liberty now to insist upon a construction of his patent which will include what he was expressly required to abandon and disavow as a condition of the grant.

Id. at 541.

⁶⁹ See *id.* at 542 (describing the prior art).

As described above,⁷⁰ in the 123 years since *Leggett*, prosecution history estoppel has become ever more closely associated with the doctrine of equivalents.⁷¹ In part, this may be a function of the rising importance (and prominence) of the doctrine of equivalents, especially after *Graham v. John Deere*. But this sort of increasing association does not justify the exclusivity that characterizes the present descriptions of prosecution history estoppel.⁷² It is certainly not commanded by the historical underpinning of the doctrine, which reveals instead a role for prosecution history in claim construction and validity determinations as well as in the analysis of the scope of equivalents. To be sure, where applicable, prosecution history estoppel is a crucially important limitation on the doctrine of equivalents; the point here is not to suggest otherwise. Instead, this historical snapshot demonstrates that the current equivalents-centered view is neither commanded, nor really supported, by the historical record. In a similar vein, the Article now turns to the question of whether the logical structure of the purported relationship between the doctrine of equivalents and prosecution history estoppel provides support for the current view.

C. *The Illogic of an Equivalents-Based Prosecution History Estoppel Theory*

Though the traditional equivalents-centered view of prosecution history estoppel finds little, if any, support in legal framework and his-

⁷⁰ See *supra* notes 36, 38 and accompanying text (discussing the relationship between prosecution history estoppel and the doctrine of equivalents).

⁷¹ See, e.g., *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 30-31 (1997) (stating that the relationship between prosecution history estoppel and the doctrine of equivalents renders the reason for filing any patent amendment relevant to the analysis); *Graham v. John Deere Co.*, 383 U.S. 1, 33, (1966) (noting, in a validity determination, that “claims that have been narrowed in order to obtain the issuance of a patent by distinguishing the prior art cannot be sustained to cover that which was previously by limitation eliminated from the patent”); *Exhibit Supply Co. v. Ace Patents Corp.*, 315 U.S. 126, 131-32 (1942) (denying a claim of infringement on grounds that the doctrine of equivalents cannot be used to recapture claims surrendered by amendment); *Smith v. Magic City Kennel Club*, 282 U.S. 784, 789 (1931) (“The case . . . calls for the application of the principle that where an applicant for a patent . . . is compelled by the rejection of his application . . . to narrow his claim . . . he cannot after the issue of the patent broaden his claim by dropping the element which he was compelled to include . . .”); *Computing Scale Co. of Am. v. Automatic Scale Co.*, 204 U.S. 609, 618-20 (1907) (rejecting the initial claims based on lack of invention over prior patents); *Hubbell v. United States*, 179 U.S. 77, 83 (1900) (holding that patentee is estopped from excluding a claim element where element was added to overcome objections based on lack of novelty over prior patents).

⁷² See *supra* note 37 and accompanying text (discussing problems stemming from prosecution history estoppel’s association with the doctrine of equivalents).

torical context, its logical failings stand out as the most striking. The problems with the equivalents-centered view of prosecution history estoppel are fundamental; indeed, a closer look reveals that the rule has relatively little to do with the doctrine of equivalents. This ill-advised linkage between these two doctrines is at the root of the missed opportunity represented by the *Festo* decisions.

The illogic of the equivalents-centered view is best exposed by deconstructing its most prolific offspring, the basic argument made against strong forms of the prosecution history estoppel,⁷³ especially the “complete bar” implemented by the majority of the Federal Circuit in *Festo VI*.⁷⁴ The claim is simple: that the alteration of the rule of prosecution history estoppel (in *Festo VI*, a change to a stronger form) fundamentally alters the scope of the doctrine of equivalents.⁷⁵ Yet

⁷³ The Supreme Court in *Festo VII* had a slightly more subtle objection—that the stronger form of estoppel (i.e., the reduction in equivalents when applied) “resort[ed] to the very literalism that the equivalents rule is designed to overcome.” *Festo VII*, 122 S. Ct. 1831, 1834 (2002). Clearly, this argument is also premised on the estoppel-equivalents linkage.

⁷⁴ *Festo VI*, 234 F.3d 558, 569 (Fed. Cir. 2001) (en banc).

⁷⁵ This view is perhaps best exemplified by the hyperbolic (and virtually hysterical) tone of the petition for certiorari in *Festo VI*: “This case presents a fundamental change in patent law accomplished by the virtual abolition of the century-old ‘doctrine of equivalents.’” Petition for Writ of Certiorari at 2, *Festo VII* (No. 00-1543). Despite the self-evident interests of the petitioner to engaging in such hyperbole, a variety of commentators have essentially followed suit. See, e.g., William M. Atkinson et al., *Was Festo Really Necessary?*, 83 J. PAT. & TRADEMARK OFF. SOC’Y 111, 111 (2001) (“In effect, the *Festo* decision may have transformed prosecution history estoppel into the exception that swallowed the rule.”); Peter J. Ayers, *Federal Circuit’s Festo Is Unfriendly Toward Patent Rights*, 163 N.J. L.J. 549, 549 (2001) (“*Festo* represents a bold new approach to limiting the doctrine of equivalents.”); Lawrence B. Ebert, *Festo: Sea Change in Patent Law?*, INTELL. PROP. TODAY, Jan., 2001, at 34 (recognizing the viewpoint that *Festo* may nullify the doctrine of equivalents); Mueller, *supra* note 39, at 8 (describing the *Festo VI* rule as one which “fundamentally contracts the availability of the venerable patent law doctrine of equivalents”). Every filing at the Supreme Court in support of the petitioner asserted that *Festo VI* narrowed, reduced, or even eliminated the doctrine of equivalents. See *supra* note 38 (citing the briefs).

Of course, this criticism may be equally directed towards the Federal Circuit itself, which uniformly suggested that the *Festo VI* decision was intended to curtail the doctrine of equivalents, though the majority seemed to admit it only grudgingly. See *Festo VI*, 234 F.3d at 578 (“A complete bar reins in the doctrine of equivalents . . .”); *id.* at 600-601 (Michel, J., concurring in part and dissenting in part) (“Unwittingly, the majority has severely limited the protection previously available to patentees. Indeed, it may nullify the doctrine of equivalents.”); *id.* at 620-624 (Linn, J., concurring in part and dissenting in part) (“[T]he majority unfairly tips the balance away from patentees and towards competitors . . .”); *id.* at 630-632 (Newman, J., concurring in part and dissenting in part) (calling the majority’s decision “legally incorrect and equitably unjust,” especially since there is no cry for drastic reform of prosecution history estoppel).

the argument collapses upon detailed inspection—taking with it the equivalents-centered view of prosecution history estoppel.

1. Prosecution History Estoppel Limits Patent Scope Only in Particular Circumstances

The fundamental problem with the equivalents-centered view of prosecution history estoppel is one of logical context. That is, the estoppel-equivalents link cannot be direct, as the circumstances under which prosecution history estoppel applies is only a small subset of the cases implicating the doctrine of equivalents. Put more directly, in virtually all cases, the scope of the doctrine of equivalents was precisely the same the day after the *Festo VI* decision as it was the day before.⁷⁶ Likewise, the scope of equivalents remained the same after *Festo VI* was vacated by the Supreme Court.

What changed was the scope of equivalents available *under particularistic circumstances*—namely, when the prosecution history indicates that the patentee clarified the scope of a particular claim element for a reason related to patentability.⁷⁷ Under those facts, the range of equivalents changed: in the pre-*Festo* era, the range of equivalents was determined by a totality of the circumstances informing the analysis;⁷⁸ under the Federal Circuit's *Festo VI* "complete bar" rule, there would be no opportunity to assert that corresponding (but non-identical) elements in an accused device or product were equivalent to those claimed (and expressly clarified); and under the Court's "presumptive bar" rule, equivalents will be restricted unless the patentee can demonstrate the unreasonableness of such a restriction.⁷⁹

Commentators who suggest that the doctrine of equivalents was permanently narrowed by *Festo VI*—such as Professor Mueller, who decried the decision as "facilitat[ing] 'fraud on a patent'"⁸⁰—appear to overlook the deeply contingent nature of the change in the availability of equivalents. Specifically, the following circumstances are absolute

⁷⁶ See *id.* at 564-65 (discussing the continued vitality of the doctrine of equivalents); *cf. supra* note 72 and accompanying text (noting *Festo VII*'s connection between estoppel and equivalents).

⁷⁷ See *Festo VI*, 234 F.3d at 563-64 (summarizing the answers to the en banc questions).

⁷⁸ See, e.g., *Litton Sys., Inc. v. Honeywell, Inc.*, 140 F.3d 1449, 1462 (Fed. Cir. 1998) (stating the pre-*Festo VI* rule relating to prosecution history estoppel).

⁷⁹ See *Festo VII*, 122 S. Ct. 1831, 1842 (2002) (describing cases of unreasonableness).

⁸⁰ Mueller, *supra* note 39, at 8.

requirements for the “devilish[.]”⁸¹ results flowing from a stronger form of prosecution history estoppel:

1. A particular claim element—we’ll call it “Element X”—is not literally found within an accused device, yet the balance of the claim elements are either literally or equivalently present;⁸²
2. There must be an element in the accused device corresponding to Element X that performs substantially the same function in substantially the same way to achieve substantially the same result;⁸³
3. Extending Element X to encompass its equivalents must not capture subject matter that is an obvious variant of the prior art;⁸⁴ and
4. Element X must have been amended or clarified during prosecution for a “reason[.] related to patentability.”⁸⁵

As should be easily apparent, claims that a stronger form of estoppel generally, or the *Festo VI* decision in particular, “aboli[shed]”⁸⁶ the doctrine of equivalents are not only greatly exaggerated, but fundamentally wrong as a matter of the patent law and logic.⁸⁷

⁸¹ *Id.*

⁸² *See, e.g.,* Warner-Jenkinson Co. v. Hilton Davis Chem. Co., 520 U.S. 17, 29 (1997) (“Each element contained in a patent claim is deemed material to defining the scope of the patented invention, and thus the doctrine of equivalents must be applied to individual elements of the claim, not to the invention as a whole.”); *see also* Pennwalt Corp. v. Durand-Wayland, Inc., 833 F.2d 931, 935 (Fed. Cir. 1987) (establishing the all-elements rule).

⁸³ *See, e.g.,* Graver Tank & Mfg. Co. v. Linde Air Prods. Co., 339 U.S. 605, 608-09 (1950) (outlining the doctrine of equivalents); Sanitary Refrigerator Co. v. Winters, 280 U.S. 30, 42 (1929) (defining equivalency under the doctrine); *Pennwalt*, 833 F.2d at 934 (construing 35 U.S.C. to require a comparison of corresponding structures and functions in determining equivalency).

⁸⁴ *See, e.g.,* K-2 Corp. v. Salomon S.A., 191 F.3d 1356, 1367 (Fed. Cir. 1999) (“[T]he doctrine of equivalents cannot allow a patent to encompass subject matter existing in the prior art.”); Wilson Sporting Goods Co. v. David Geoffrey & Assocs., 904 F.2d 677, 684 (Fed. Cir. 1990) (denying application of equivalents where the asserted equivalent exists in the prior art).

⁸⁵ *Festo VI*, 234 F.3d at 566-68 (quoting *Warner-Jenkinson*, 520 U.S. at 33).

⁸⁶ *See* Petition for Writ of Certiorari at 2, *Festo VII*, 122 S. Ct. 1831 (2002) (No. 00-1543); *see also supra* note 75 (citing sources that make this claim).

⁸⁷ Note that the *exact* results that these commentators (and advocates) decry would occur in the example above in the presence of a fifth criterion: that the patentee had appeared to surrender subject matter related to the accused device. *See, e.g.,* Litton Sys., Inc. v. Honeywell, Inc., 140 F.3d 1449, 1462 (Fed. Cir. 1998) (stating the pre-*Festo VI* rule relating to prosecution history estoppel). Accordingly, one view of the *Festo VI* decision is that it reflected a determination that the costs of analyzing that fifth factor (in terms of difficulty, inability to be consistently accurate, and uncertainty costs on the

2. Prosecution History Estoppel Is Avoidable, and Thus Impacts Prosecution Far More than Infringement

The equivalents-centered view of prosecution history estoppel also seems to obscure the consideration of its actual effects. Rather than providing a “template for free riding,”⁸⁸ the logic of prosecution history estoppel points the way for a patentee to ensure that her claim receives the full benefits of the doctrine of equivalents. Simply put: avoid prosecution history estoppel.⁸⁹ Rather than being hapless victims of a tyrannical anti-patent Federal Circuit,⁹⁰ patentees could take a number of steps to avoid any potentially deleterious consequences of a finding of prosecution history estoppel during litigation, such as conducting prior art research to determine the appropriate scope of the claims,⁹¹ drafting claims more carefully, either claiming more narrowly to avoid the prior art, or crafting claims that, when amended, maintain a broad scope of literal coverage. And as I argue in Parts III and IV below, the beneficial effects of such behavior will far outweigh the costs of imposing such incentives.) Thus, while prosecution history estoppel impacts only the subset of cases where equivalents are at issue, its incentive-effects on patent prosecution (and pre-prosecution) behavior are universal.

3. The Only Real, Direct, Scope-Altering Effects of Estoppel Are Transitional (and Fractional)

It must be granted, however, that there is a potentially valid concern that the change in the law marked by the series of *Festo* decisions

marketplace) were outweighed by the benefits of certainty and clarity that would accrue by stopping the analysis at item four.

⁸⁸ Mueller, *supra* note 39, at 8.

⁸⁹ It's important to note that there has always been significant incentive to avoid prosecution history estoppel, even prior to the *Festo* decisions. See, e.g., *Festo VI*, 234 F.3d at 596-97 (Lourie, J., concurring) (“Surely, when prosecuting a patent, patent practitioners have no settled expectations of being able to assert the doctrine of equivalents.”); see also *Litton Sys.*, 140 F.3d at 1456 (stating the pre-*Festo VI* rule that prosecution history estoppel “may have a limiting effect within a spectrum ranging from great to small to zero” (citations and quotations omitted)).

⁹⁰ See, e.g., Ayers, *supra* note 75, at 549 (explaining how the Federal Circuit, with exclusive appellate jurisdiction over patent suits, abruptly changed the doctrine of equivalents without regard to any controlling authority).

⁹¹ Thus, avoiding amendments that might be required by the PTO. Cf. *Festo VI*, 234 F.3d at 566-68 (describing the circumstances triggering prosecution history estoppel).

would, at least potentially,⁹² significantly impact the many thousands of patents that were prosecuted under pre-*Festo* understandings of prosecution history estoppel.⁹³ In other words, the argument goes, the impact of strengthening prosecution history estoppel might fall disproportionately upon presently existing patentees.

While this argument clearly deserves consideration, it falls well short of a convincing case. As an initial matter, it is important to note that this form of argument—that change X in the law will impact settled expectations Y—is equally applicable to virtually any patent law reform, especially those achieved judicially. Indeed, it is deeply ironic that the Supreme Court noted the “settled expectations” of existing patentees as a major factor in their decision to vacate the *Festo VI* opinion⁹⁴—immediately before promulgating a wholly new “presumptive bar” that (at least in the Court’s view) significantly strengthened estoppel over its pre-*Festo* state.⁹⁵ Further, the argument is plainly not confined to the patent law, but rather could be used as a means to prevent changes in the law across virtually the entire spectrum of social ordering. This is not to suggest that such arguments are inherently specious or unpersuasive, but instead to note that they must be (and are) surmounted anytime the law is changed.

Second, there is good reason to doubt that this transitional effect would be dramatic. As noted above, any effect on the doctrine of equivalents occurs only for particular claim elements, and under quite specific circumstances.⁹⁶ While it is certainly true that many patent claims are amended during prosecution, it cannot be seriously suggested that (a) all patent claims are amended; or (b) all elements of

⁹² See *supra* notes 82-85 and accompanying text (noting the requirements to trigger the *Festo VI* rule).

⁹³ See *supra* notes 78, 87, 89 (describing the pre-*Festo* status of estoppel).

⁹⁴ *Festo VII*, 122 S. Ct. at 1841 (“Inventors who amended their claims under the previous regime had no reason to believe they were conceding all equivalents. If they had known, they might have appealed the rejection instead. There is no justification for applying a . . . more robust estoppel to those who relied on prior doctrine.”).

There is a particular problem with this “settled expectations” argument here: as noted by Judge Lourie, patentees who amended their claims under the pre-*Festo* regime had little doubt that their patent scope was going to be significantly reduced. See, e.g., *Festo VI*, 234 F.3d at 596-97 (Lourie, J., concurring) (“Surely, when prosecuting a patent, patent practitioners have no settled expectations of being able to assert the doctrine of equivalents.”); see also *infra* note 98 (discussing another example of the “settled expectations” argument).

⁹⁵ See *Festo VII*, 122 S. Ct. at 1842 (asserting that, while stronger, the new rule is “not . . . the complete bar by another name”).

⁹⁶ *Supra* note 77 and accompanying text.

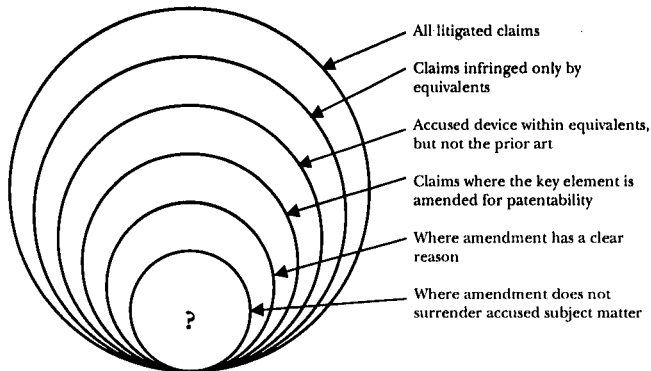
all claims are amended. Thus, the most that can be determined is that *some* elements of *many* claims are amended during prosecution. The next question is whether those amended elements fall within the criteria noted above: an accused device that infringes under equivalents but is not within any prior art; a correspondence between an element of the claim and a substantially similar element in the accused device; and the existence of prosecution history estoppel. This is obviously a rather small subset of the "some elements of many claims" phraseology. But the impact is still smaller than that: under the pre-*Festo* regime, if the prosecution history indicated that the subject matter surrendered by the claim amendment or clarification was related to the accused device, then equivalents were not extended.⁹⁷ And yet the circle gets smaller: under pre-*Festo* rules, if it was *unclear* what was surrendered by the patentee during prosecution, equivalents were barred as well.⁹⁸ Figure 1 stylistically depicts this analysis.

⁹⁷ See, e.g., *Pharmacia & Upjohn Co. v. Mylan Pharm., Inc.*, 170 F.3d 1373, 1376-77 (Fed. Cir. 1999) (finding prosecution history estoppel applied to subject matter clearly surrendered).

⁹⁸ See, e.g., *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 33 (1997) (barring all equivalents where the purpose of an amendment is unclear). *Warner-Jenkinson* also provides another example of the Court's seemingly arbitrary invocation of the "settled expectations" argument. At one point, the Court noted that "[t]o change so substantially the rules of the game now could very well subvert the various balances the PTO sought to strike when issuing the numerous patents which have not yet expired and which would be affected by our decision." *Id.* at 32 n.6. But then the Court goes on to change the rules of the game:

[T]he better rule is to place the burden on the patent holder to establish the reason for an amendment required during patent prosecution. The court then would decide whether that reason is sufficient to overcome prosecution history estoppel as a bar to application of the doctrine of equivalents to the element added by that amendment. Where no explanation is established, however, the court should presume that the PTO had a substantial reason related to patentability for including the limiting element added by amendment. In those circumstances, prosecution history estoppel would bar the application of the doctrine equivalents as to that element.

Id. at 33.

Figure 1: The Fractional, Transactional Impact of Changing Estoppel

If, for example, the set of cases diminishes by half as each criterion is reached, then the set of cases x impacted by a change in the estoppel rules would be represented by the following equation:

$$x = \frac{C_L}{2^5}$$

where C_L is the number of litigated claims. Assume about two million patents were issued as of the *Festo VI* and *VII* decisions, and that about 40,000 will be litigated during their term, though only about 4000 will get to court.⁹⁹ Statistics show that about half of these will be found invalid,¹⁰⁰ so that implies a maximum potential 20,000 valid patents litigated (or a minimum of about 2000). Assume each patentee asserts, on average, two claims per patent, yielding 40,000 potentially litigated claims (or 4000 actually litigated). On these assumptions,¹⁰¹ and using the formula above, the change in estoppel rules will impact roughly a

⁹⁹ Where possible, I have based these numbers primarily on those used by Mark Lemley in his recent study of the costs and benefits of additional “screening” by the PTO. See Mark A. Lemley, *Rational Ignorance at the Patent Office*, 95 NW. U. L. REV. 1495, 1501 (2001) (“The limited data we have suggest that the overwhelming majority of patents are neither litigated nor licensed.”). Lemley estimates that about two percent of all outstanding patents are litigated, and that only about two-tenths of one percent actually are addressed by courts. *Id.*

¹⁰⁰ John R. Allison & Mark A. Lemley, *Empirical Evidence on the Validity of Litigated Patents*, 26 AM. INTEL. PROP. L. ASS’N Q.J. 185 (1998).

¹⁰¹ And, to reiterate, they are assumptions.

maximum of 1250 claims (or 625 patents)—just slightly more than .03% of the total patents outstanding.¹⁰²

This Part has demonstrated that the contemporary view of prosecution history estoppel as solely a legal limitation on the scope of the doctrine of equivalents is profoundly incomplete. Such a view is not supported by the patent law, which reflects an extensive use of prosecution history information in analyses of claim construction and invalidity,¹⁰³ in addition to the use of prosecution history in the doctrine of equivalents context. Further, the historical roots of the use of prosecution history estoppel neither require nor support the equivalents-centered view; instead, the traditions of the use of patentee-provided contemporaneous information is one which encompasses analytical inquiries beyond the doctrine of equivalents. And finally, this Part has explored the logic of the present—limited—understanding of prosecution history estoppel, noting that the equivalents-centered view has obscured, to a significant degree, a full consideration of the real effects of prosecution history estoppel decisions.

Having thus called into doubt the contemporary understanding of prosecution history estoppel, the balance of this Article turns to the development of a more complete view of prosecution history estoppel and its role within the modern patent system. Such an undertaking implies a theory of the administration of the patent system itself, as explained in the next Part.

II. THE ROLE OF PROSECUTION HISTORY ESTOPPEL, PART I: *INFORMATION*

The United States patent system traditionally has been justified in terms of utilitarian notions of the use of incentives to stimulate prog-

¹⁰² Arguably, the denominator here might more appropriately be the total number of valid patents litigated. Under that view, the 625 potentially affected patents represent 3.1% of the total patents litigated (i.e., 625/20,000).

Using the number of patents that actually get into court, the percentage of all patents affected would be .000625%, and the percentage of valid litigated patents would be .6%.

In addition, note that to the extent that litigation rates vary by industry, see Josh Lerner, *Patenting in the Shadow of Competitors*, 38 J.L. & ECON. 463, 476 (1995) (showing that biotechnology patents were involved in litigation at the higher rate of 5.5%), the effects of changing the estoppel rule will be distributed somewhat unevenly.

¹⁰³ See *supra* notes 42-54 and accompanying text (noting an array of uses of prosecution history).

ress¹⁰⁴—innovation and related activities¹⁰⁵—in the “sciences and the useful arts.”¹⁰⁶ To this end, the current patent statute, Title 35 of the United States Code grants the patent holder a right to exclude others from the subject matter of the patent for twenty years,¹⁰⁷ in exchange for a full public explanation of the details of the invention and its operation,¹⁰⁸ thereby implementing a quid pro quo that is at the heart of the modern patent administration system.¹⁰⁹ The phrase “patent *ad-*

¹⁰⁴ See, e.g., Jeremy Waldron, *From Authors to Copiers: Individual Rights and Social Values in Intellectual Property*, 68 CHI-KENT L. REV. 841, 850-56 (1993) (setting forth the utilitarian explanation for intellectual property). Of course, rights-based theories do exist. See, e.g., Wendy J. Gordon, *A Property Right in Self-Expression: Equality and Individualism in the Natural Law of Intellectual Property*, 102 YALE L.J. 1533, 1535-39 (1993) (arguing for a natural rights theory of intellectual property); Justin Hughes, *The Philosophy of Intellectual Property*, 77 GEO. L.J. 287, 288-90 (1988) (examining intellectual property through the lens of both labor- and personality-based theories of individual property rights); see also DONALD S. CHISUM ET AL., *PRINCIPLES OF PATENT LAW* 42-53 (2d ed. 2001) (exploring rights-based theories and collecting sources, including those above).

¹⁰⁵ There are a number of activities that are stimulated by the existence of the patent system, including: inventive behavior itself, investment in innovation and research and development, the disclosure of innovations, the commercialization of new products and services, and the development of follow-on (or “design-around”) innovations. There are a number of excellent works describing the ways that the patent system creates these incentives, a few of which are listed here. See, e.g., CHISUM ET AL., *supra* note 104, at 70-75 (collecting major scholarly works concerning these incentives); see also RICHARD A. POSNER, *ECONOMIC ANALYSIS OF LAW* 43-44 (5th ed. 1998) (describing the basic incentives); Eisenberg, *supra* note 10, at 1017-21 (discussing the negative effects of broad patent scope on improvements through complications of access to patented material for further research); Kieff, *supra* note 10, at 703 (embracing a property framework for achieving the goals of the patent system); Kitch, *supra* note 10, at 284-85 (arguing that the initial inventor should receive broad patent rights in order to enable coordination of subsequent improvement efforts); Merges & Nelson, *supra* note 10, at 842-44 (employing economic analysis to demonstrate that inventors must be protected to invest in new ideas without fear but should remain in a competitive environment in order to get the most from the invention); Giles S. Rich, *The Relation Between Patent Practices and the Anti-Monopoly Laws* (pts. 1-5), 24 J. PAT. OFF. SOC'Y 85, 159, 241, 328, 422 (1924); Suzanne Scotchmer, *Standing on the Shoulders of Giants: Cumulative Research and the Patent Law*, J. ECON. PERSP., Winter 1991, at 29, 32 (asserting the efficiency of protecting initial investors over later investors' ability to obtain patents).

¹⁰⁶ U.S. CONST. art. I, § 8, cl. 8.

¹⁰⁷ See 35 U.S.C. § 271(a) (2000) (describing the rights of the patent holder). The term is 20 years from the filing of the patent application. 35 U.S.C. § 154(a)(2) (2000).

¹⁰⁸ See 35 U.S.C. § 112 (2000) (describing the contents of a claim and specification).

¹⁰⁹ Classically, the quid pro quo is described as a form of bargain between the inventor-patentee and society, whereby the patentee receives a right against the public in exchange for full disclosure and a limited term. See, e.g., *Bonito Boats, Inc. v. Thunder Craft Boats, Inc.*, 489 U.S. 141, 150-51 (1989) (“The federal patent system thus embodies a carefully crafted bargain for encouraging the creation and disclosure of new, use-

administration system” here is intended to be analytically distinct from the phrase “patent system,” on the grounds that irrespective of the theoretical justifications for the patent system and their implications for patent policy, there remains the crucial (and yet perhaps less considered) mechanism for implementing whatever patent policies are desired.¹¹⁰ That is, any patent system will have a series of rules, regulations, and procedures by which the underlying policies are implemented. This Article seeks to inform the contemporary arguments surrounding the *administration* of the patent system, as opposed to the system itself, starting from two basic premises: first, that the patent system is one of proportional reward, and second, that the patent system is built upon the concept of exchange, a public disclosure in exchange for the public grant of rights.¹¹¹

A. Foundational Elements: Proportional Reward and Exchange

“Proportional reward” refers to the fact that the modern patent system contemplates that the return from the grant of a patent will be a function of the quantity of the innovation created—the greater the innovation, the greater the (potential)¹¹² reward.¹¹³ As should be obvi-

ful, and non-obvious advances in technology and design in return for the exclusive right to practice the invention for a period of years.”)

¹¹⁰ Indeed, one additional explanation for the incompleteness of the equivalent-centered view of prosecution history estoppel is the intermingling of these two distinct concepts: the underlying patent policies and the means by which any policies are implemented.

¹¹¹ As will be seen below, the theory assumes no more than a relationship between innovation, disclosure, and patent scope, and is thus equally applicable to broad prospect-based theories of patents. See, e.g., Kitch, *supra* note 10, at 267 (asserting that any patent system will have prospect elements, and the rules of a patent system can be adjusted so as to make the prospect function important). For narrower inventive-based theories, see Merges & Nelson, *supra* note 10, at 868-84.

¹¹² Of course, circumstances such as luck, timing, and non-technical skills such as marketing and promotion factor significantly in any commercial activity, and there is no reason to believe the commercialization of patentable inventions to be any different. Instead, the suggestion here is that—all other things being equal—a larger scope of the grant will yield a larger return.

¹¹³ Inventors with larger advances over the prior art will be able successfully to prosecute broader claims, see, e.g., 35 U.S.C. §§ 102, 103 (2000) (denying entitlement of a patent if the invention has already been described in a previous patent or obvious at the time of invention), thereby increasing the subject matter from which they can exclude others. On occasion, the courts have referred to “pioneer patents” as those to which greater rights are attached due to their significant advance over the state of the art. See, e.g., Warner-Jenkinson Co. v. Hilton Davis Chem. Co., 520 U.S. 17, 27 (1997) (noting the “judicial recognition of pioneer inventions”); Perkin-Elmer Corp. v. Westinghouse Elec. Corp., 822 F.2d 1528, 1531 (Fed. Cir. 1987) (evaluating whether a par-

ous, this is not a necessary condition for the operation of a patent system—direct cash rewards or subsidy systems arguably could achieve at least some of the policy goals of the patent system¹¹⁴—but accurately describes the present patent administration system. The assignment of commercial value is left to the operation of the market; each patent grant, by sheltering the holder from full competition within its scope, will have a unique return based on market acceptance. A major determinant of return in such a system will be the scope of the patent grant—that is, the scope of the right to exclude. The larger the grant, the greater the return.

The other major premise of the patent administration system is that of “exchange,” describing the law’s insistence that the patentee surrender knowledge of the invention for the public franchise of a patent.¹¹⁵ Importantly, the exchange requirement in the patent law

ticular invention qualifies as pioneer in nature); *In re Hogan*, 559 F.2d 595, 606 (C.C.P.A. 1977) (acknowledging “broad protection for pioneer inventions”).

¹¹⁴ See, e.g., Michael Kremer, *Patent Buy-outs: A Mechanism for Encouraging Innovation*, 113 Q. J. ECON. 1137, 1137 (1998) (highlighting a system where the government conducts auctions to “buy out” patent rights); Steven Shavell & Tanguy Van Ypersele, *Rewards Versus Intellectual Property Rights*, 44 J.L. & ECON. 525, 525 (2001) (proposing a system that would reward inventors with government funds); Michael Abramowicz, *Perfecting Patent Prizes 7* (2002) (unpublished manuscript, on file with the University of Pennsylvania Law Review) (“[The prize system] is more likely to encourage cost-effective concessions and projects that best offset the monopoly effects of patents.”). The proponents of the reward theories suggest that such mechanisms might provide the incentive to invent without the potential costs of deadweight loss and inappropriate allocation of social surplus that they consider hallmarks of the present proportional reward system. As Professor Kieff persuasively demonstrates, however, such proposals are unlikely to provide incentives for investments in commercialization that may reflect the most crucial incentive provided by the patent system. Kieff, *supra* note 10, at 705-12. Kieff also notes that reward proposals do not adequately address the screening of patents by competitors enabling the present system to distinguish between worthy and unworthy innovations. *Id.* at 712-17.

¹¹⁵ The patent law’s basic disclosure requirement is found in § 112, specifically in paragraphs 1 and 2:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

35 U.S.C. § 112 (2000); see also *supra* note 109 (explaining the quid pro quo at the heart of patent administration).

does more than simply mandate *some* disclosure—it affirmatively links the quantum of disclosure to the scope of the patent grant.¹¹⁶

B. *The Central Objective: Linking Innovation, Disclosure, and Scope*

These two guiding premises—proportional reward and exchange—underlie the fundamental inquiry relating to the administration of the patent system. In one word: scope.

As should be obvious, proportional reward establishes patent scope as a primary driver (though not the only factor¹¹⁷) in the reward mechanism. Similarly, the exchange premise also compels consideration of scope, though the analysis is slightly different. Here, scope refers to two distinct concepts: the scope of the *patent grant* and the scope of the *disclosed innovation*. And yet, given the exchange premise of the modern patent administration system,¹¹⁸ patent grant scope is functionally linked to innovation disclosure scope. That is, not only does a patent grant follow the disclosure of innovation,¹¹⁹ but the quantum of the patent grant will largely depend upon the quantum of the disclosure.¹²⁰

¹¹⁶ The scope of the patent grant is (at least nominally) determined by the breadth of the claims. *See, e.g.*, *Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 370 (1996) (“The claim defines the scope of the patent grant . . .” (citation omitted)). The breadth of the claims is limited by the scope of disclosure, according to the § 112 requirements of enablement, *see, e.g.*, *Consol. Elec. Light Co. v. McKeesport Light Co.*, 159 U.S. 465, 474-75 (1895) (patentees may not claim more broadly than they teach about their invention), written description, *see, e.g.*, *Vas-Cath, Inc. v. Mahurkar*, 935 F.2d 1555, 1560 (Fed. Cir. 1991) (patentees may not claim beyond what they disclose to have actually invented), best mode, *see, e.g.*, *Chemcast Corp. v. Arco Indus. Corp.*, 913 F.2d 923, 926 (Fed. Cir. 1990) (patentees must provide description of the best method of using their claims), and definiteness, *see, e.g.*, *Gen. Elec. Co. v. Wabash Appliance Corp.*, 304 U.S. 364, 368 (1938) (patentees must accurately and precisely define the invention).

¹¹⁷ *See supra* note 114 and accompanying text (addressing the system efficiencies realized through a rewards approach).

¹¹⁸ *See supra* note 115 and accompanying text (explaining that the patent system is premised on an exchange of knowledge of the invention for the patent right).

¹¹⁹ *See, e.g.*, *United States v. Dubilier Condenser Corp.*, 289 U.S. 178, 186 (1933) (“[The inventor] may keep his invention secret and reap its fruits indefinitely. In consideration of its disclosure and the consequent benefit to the community, the patent is granted.”).

¹²⁰ *See supra* note 116 and accompanying text (citing cases in support of this proposition). Note that the theory of patent administration sketched in this Part does not assume equivalence between patent scope and innovation disclosure. A patentee may claim only to the boundaries of her disclosure. *See, e.g.*, *Gentry Gallery, Inc. v. Berkline Corp.*, 134 F.3d 1473, 1480 (Fed. Cir. 1998) (“[Prior cases] make clear that claims may be no broader than the supporting disclosure, and therefore that a narrow

Thus, the question of scope illuminates the interaction between the two foundational premises of the patent administration system. The quantum of reward is a function of the scope of the patent grant, which is, in turn, a function of the quantum of disclosure.¹²¹ Thus, the premises of proportional reward and exchange create an explicit and direct link between the disclosure of innovations and their potential marketplace reward. This link is not merely factual—that one exists implies the other—but also *quantitative*: greater disclosure of innovations will yield correspondingly greater patent scope (and thus greater potential commercial rewards).

To clarify the argument, note the following observation: the relationship between innovation, disclosure, and scope is established by the patent law in such a way as to maximize social welfare. That is, the policies animating the patent system as a whole speak to the existence and nature of the connection between innovation, scope, and disclosure. Of course, this principle is independent of the details of the relationship. One can imagine patent policy regimes in which the inventor is allowed to claim more than she disclosed (and thus

disclosure will limit claim breadth.”). While a strict reading of § 112, *supra* note 115, may support this contention, it does not accurately reflect the state of the patent law. First, and most obviously, the doctrine of equivalents allows patentees to expand their rights to exclude (i.e., the patent grant) beyond the literal language of the claims. *See, e.g.,* Graver Tank & Mfg. Co. v. Linde Air Prods., Co., 339 U.S. 605, 612 (1950) (applying the doctrine of equivalents to expand a claim beyond its express terms). Second, patentees are generally allowed to draw claims that stretch at least slightly beyond their disclosure. *See, e.g.,* Ethicon Endo-Surgery, Inc. v. United States Surgical Corp., 93 F.3d 1572, 1583 (Fed. Cir. 1996) (holding that claims need not be limited to disclosed embodiments); *see also* Johnson Worldwide Assocs., Inc. v. Zebco Corp., 175 F.3d 985, 993 (Fed. Cir. 1999) (noting that *Gentry Gallery* was limited to cases where the patentee had been “crystal clear” concerning the limits of the invention). One explanation for such claim “creep” notes that the law measures disclosure by what it suggests to those of skill in the art rather than its bare words. *See, e.g.,* Loom Co. v. Higgins, 105 U.S. 580, 582 (1881) (asserting that persons skilled in the art to which a patent is directed “would readily appreciate the meaning of the terms and the character of the improvement described”).

Furthermore, prospect and commercialization theories of patenting, presented *supra* note 114, imply a patent scope that is at least somewhat broader than the disclosure. *See, e.g.,* Kieff, *supra* note 10, at 717 (arguing that the commercialization view of the patent system is superior to the proposed reward and buy-out systems); Kitch, *supra* note 10, at 287 (“The prospect [function] creates an incentive in the owner to efficiently disseminate information about the invention himself.”). Importantly, however, even these broader views of patent scope recognize the relationship between scope and disclosure, and thus fit easily within the theory of patent administration suggested here.

¹²¹ *Supra* notes 115-16 and accompanying text.

invented),¹²² as well as systems that offer less coverage.¹²³ As should be apparent, the characteristics of this relationship are deeply bound up with basic patent policy issues such as the nature and function of the patent grant and its appropriate scope, temporal length, etc.¹²⁴

If, then, the patent law establishes a direct link between innovation, disclosure, and patent scope,¹²⁵ and if this functional relationship implicates the underlying patent policies, then it follows that the central tenet of a patent administration system is to maintain the integrity of that link. For only then will both the premises of proportional reward and exchange be fully addressed.¹²⁶ The balance of this Article turns to the ways that the patent law seeks to maintain this relationship between innovation, scope, and disclosure, noting the important role played by prosecution history in this task.

C. *Maintaining the Relationship: The Centrality of Prosecution History*

The patent law contains several tools of patent administration that support the objective of linking innovation, disclosure, and scope. The patent administration system's ability to meet this objective is challenged by two fundamental concerns: the availability of information and the temporal aspects of the patent grant. Information is crucial because the link between innovation, disclosure, and scope involves a series of highly-detailed, contextual analyses, performed—at least in some cases—by those not especially familiar with the details of the technology. The temporal concerns arise because of the dual-

¹²² As noted above, *supra* note 112, theories of patent policy concerned with commercialization incentives or "prospects" might well lead to a rule that allows broader rights than disclosure. See, e.g., Kieff, *supra* note 10, at 717 (discussing commercialization); Kitch, *supra* note 10, at 22 (arguing for broad "prospect patents"). And, to at least some degree, the present patent law reflects such a rule. See, e.g., *Craver Tank & Mfg.*, 339 U.S. at 608-09 (explaining the doctrine of equivalents); *Ethicon Endo-Surgery*, 93 F.3d at 1582 & n.7 (demonstrating that claims are not limited to disclosed embodiments).

¹²³ An argument can be made that the Federal Circuit has adopted a "narrow claiming" rule for certain biotechnological and chemical inventions. See, e.g., *Regents of the Univ. of Cal. v. Eli Lilly & Co.*, 119 F.3d 1559, 1569 (Fed. Cir. 1997) (invalidating potentially enabled claims because the disclosure did not precisely describe them); see also *Fiers v. Revel*, 984 F.2d 1164, 1169-70 (Fed. Cir. 1993) (considering the relationship between disclosure and claims); *Amgen, Inc. v. Chugai Pharma. Co.*, 927 F.2d 1200, 1213-14 (Fed. Cir. 1991) (same).

¹²⁴ See *supra* note 10 and accompanying text (describing basic patent policy debates).

¹²⁵ *Supra* Part II.A.

¹²⁶ See *supra* Introduction (describing premises of modern patent system).

stage nature of patent administration and the corresponding need to maintain the appropriate links between innovation, scope, and disclosure throughout the patent's term. A review of these concerns reveals that prosecution history information uniquely provides an answer by producing contemporaneous, patentee-provided information and by ensuring that later analyses operate in the shadow of earlier understandings. Thus, prosecution history estoppel stands at the center of the properly functioning patent administration system.

1. The Tools of Patent Administration

a. *Disclosure requirements*

Unquestionably, the fundamental tool of the patent administration system is the statutory disclosure requirements, codified at 35 U.S.C. § 112. Specifically, § 112 contains the following rules:

the *enablement* requirement—the patent document must be sufficiently descriptive so as to place the subject matter of the invention in the hands of one of skill in the relevant technology;¹²⁷

the *written description* requirement—the claimed invention must be adequately supported and described by the document;¹²⁸

the *best mode* requirement—the best-known mode of operation of the invention must be disclosed in the patent;¹²⁹ and

¹²⁷ 35 U.S.C. § 112, para. 1 (2000); *see, e.g.*, *Loom Co. v. Higgins*, 105 U.S. 580, 594 (1881) (“An invention relating to machinery may be exhibited either in a drawing or in a model, so as to lay the foundation of a claim to priority, if it be sufficiently plain to enable those skilled in the art to understand it.”); *Grant v. Raymond*, 31 U.S. (6 Pet.) 218, 232 (1832) (stating that one of the goals of the enablement requirement is to “enable any person skilled in the art to make and use [the invention]”).

¹²⁸ 35 U.S.C. § 112, para. 1 (2000); *see, e.g.*, *Evans v. Eaton*, 20 U.S. (7 Wheat.) 356, 380-81 (1822) (describing the written description requirement); *Gentry Gallery, Inc. v. Berkline Corp.*, 134 F.3d 1473, 1479 (Fed. Cir. 1998) (“To fulfill the written description requirement, the patent specification ‘must clearly allow persons of ordinary skill in the art to recognize that [the inventor] invented what is claimed.’” (quoting *In re Gosteli*, 872 F.2d 1008, 1012 (Fed. Cir. 1989))); *Vas-Cath, Inc. v. Mahurkar*, 935 F.2d 1555, 1563 (Fed. Cir. 1991) (distinguishing the written description requirement from the enablement requirement).

¹²⁹ 35 U.S.C. § 112, para. 1 (2000); *see, e.g.*, *Chemcast Corp. v. Arco Indus. Corp.*, 913 F.2d 923, 927-28 (Fed. Cir. 1990) (stating that the best mode analysis consists of both a subjective analysis—whether the inventor knew of a better mode of practicing her claimed invention—and an objective analysis—whether her disclosure was adequate); *Spectra-Physics, Inc. v. Coherent, Inc.*, 827 F.2d 1524, 1532 (Fed. Cir. 1987) (describing the essence of the best mode requirement as demanding of the inventor “the best mode *contemplated by him*, as of the time he executes the application, of carrying out his invention” (quoting *In re Gay*, 309 F.2d 769, 772 (C.C.P.A. 1962))).

the *definiteness* requirement—the patent document must, via the claims, “particularly point[] out and distinctly claim[] the subject matter which the applicant regards as his invention.”¹³⁰

For purposes of patent administration, the enablement and written description requirements work to maintain the link between the disclosure provided in the patent document with the scope of the claims. Enablement restrains the patentee from seeking claims that are broader than what the patent effectively “teaches” the public (in the form of those of skill in the relevant art) about the nature of the invention.¹³¹ The written description requirement similarly ties the scope of the claims to the disclosure by requiring that the claimed invention be described in adequate detail.¹³² The definiteness requirement ensures that the claims are clear and distinct enough for such analyses.¹³³

Correspondingly, the best mode and the written description requirements each enforce a relationship between the patent disclosure and the innovation itself. The best mode requirement ensures that

¹³⁰ 35 U.S.C. § 112, para. 2 (2000); *see, e.g.*, *United Carbon Co. v. Binney & Smith Co.*, 317 U.S. 228, 236 (1942) (“The statutory requirement of particularity and distinctness in claims is met only when they clearly distinguish what is claimed from what went before in the art and clearly circumscribe what is foreclosed from future enterprise.”); *Gen. Elec. Co. v. Wabash Appliance Corp.*, 304 U.S. 364, 368-69 (1938) (“Recognizing that most inventions represent improvements on some existing article, process, or machine . . . Congress requires of the applicant ‘a distinct and specific statement of what he claims to be new, and to be his invention.’” (quoting *Merrill v. Yeomans*, 94 U.S. 568, 570 (1876))).

¹³¹ *See, e.g.*, *Nat’l Recovery Techs., Inc. v. Magnetic Separation Sys., Inc.*, 166 F.3d 1190, 1195-96 (Fed. Cir. 1999) (“The enablement requirement ensures that the public knowledge is enriched by the patent specification to a degree at least commensurate with the scope of the claims. The scope of the claims must be less than or equal to the scope of enablement.”).

¹³² *See Gentry Gallery*, 134 F.3d at 1479 (“[I]n a given case, the scope of the right to exclude may be limited by a narrow disclosure [under the § 112 written description requirement].”). Note that while the courts insist that the written description requirement is distinct from enablement, *see Vas-Cath*, 935 F.2d at 1563 (“[W]e hereby reaffirm, that 35 U.S.C. § 112, first paragraph, requires a ‘written description of the invention’ which is separate and distinct from the enablement requirement.”), others are less than certain, *see, e.g.*, Mark Janis, *On Courts Herding Cats: Contending with the “Written Description” Requirement (and Other Unruly Patent Disclosure Doctrines)*, 2 WASH. U. J.L. & POL’Y 55, 62-63 (2000) (“[N]either the Federal Circuit nor the C.C.P.A. has ever articulated a persuasive rationale for distinguishing the written description requirement from the enablement requirement.”); Kevin Rhoades, *The Section 112 “Description Requirement”—A Misbegotten Provision Confirmed*, 74 J. PAT. & TRADEMARK OFF. SOC’Y 869, 869 (1992) (“[T]here is in fact no justification for carving out a separate ‘description requirement’ for the ‘enablement requirement’ in § 112.”).

¹³³ *See, e.g.*, *United Carbon*, 317 U.S. at 236 (“[T]he claims must be reasonably clear-cut to enable courts to determine whether novelty and invention are genuine.”).

patentees will provide adequate detail about the preferable operation of their innovation.¹³⁴ And the written description requirement, here, links the inventor's actual intellectual activity with what is disclosed.¹³⁵

Thus, the § 112 disclosure requirements set forth the most significant mechanism by which the patent administration system maintains the link between innovation, disclosure, and scope.

b. *Determining patent scope*

The tools used to measure and analyze patent scope also reflect a singular concern with the identified goals of patent administration. Claim construction principles hold that the disclosure will often determine the scope of the claim.¹³⁶ Further, the use of the "doctrine of equivalents" to expand the right to exclude is justified on the grounds that it better reflects the intellectual contribution of the inventor.¹³⁷

Even more obscure principles of patent scope analysis explicitly link the concepts of innovation, disclosure, and scope. For example, the judicial recognition of "pioneer inventions" and the purported

¹³⁴ See, e.g., *Wahl Instruments, Inc. v. Acvious, Inc.*, 950 F.2d 1575, 1579 (Fed. Cir. 1991) ("The purpose of the best mode requirement is to restrain inventors from applying for a patent while at the same time *concealing* from the public preferred embodiments of their inventions which they have in fact conceived."); *Amgen, Inc. v. Chugai Pharm. Co.*, 927 F.2d 1200, 1210 (Fed. Cir. 1991) ("[Best mode] is a requirement that the quid pro quo of the patent grant be satisfied. One must not receive the right to exclude others unless at the time of filing he has provided an adequate disclosure of the best mode known to him of carrying out his invention.").

¹³⁵ See 3 DONALD S. CHISUM, *CHISUM ON PATENTS: A TREATISE ON THE LAW OF PATENTABILITY, VALIDITY AND INFRINGEMENT* § 7.04 (2001) (arguing that the written description requirement serves as a mechanism for ensuring that the patentee, as of the filing date, actually had possession of the invention).

¹³⁶ See, e.g., *Vitronics Corp. v. Conceptronc, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996) ("[T]he specification is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term."); *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979 (Fed. Cir. 1995) ("For claim construction purposes, the description may act as a sort of dictionary, which explains the invention and may define terms used in the claims.").

¹³⁷ As the Court noted in *Winans v. Denmead*, 56 U.S. (15 How.) 330 (1853):

It is this new mode of operation which gives it the character of an invention, and entitles the inventor to a patent; and this new mode of operation is, in view of the patent law, the thing entitled to protection

Now, while it is undoubtedly true, that the patentee may so restrict his claim as to cover less than what he invented, or may limit it to one particular form of machine, excluding all other forms, though they also embody his invention, yet such an interpretation should not be put upon his claim if it can fairly be construed otherwise.

award of broader scope to such inventions¹³⁸ is a direct link between innovation and patent scope. And the use of prior art as an affirmative limit on the patent scope is likewise a recognition of the relationship between the quantum of innovation and the scope of the patent grant.¹³⁹

2. The Challenges of Patent Administration: Information and Era

a. *Information dependencies*

The analyses underlying both the disclosure requirements and the limits of patent scope are highly information-dependent.

The disclosure requirements necessitate consideration of the objective “level of ordinary skill” in the relevant technology, a consideration of the precise metes and bounds of the information contained in the patent disclosure, and the subjective understanding of the patentee about the best way of using the invention. These requirements

¹³⁸ See generally John R. Thomas, *The Question Concerning Patent Law and Pioneer Inventions*, 10 HIGH TECH. L.J. 35, 43 (1995) (discussing the possibility that an examiner might read a claim more broadly than the inventor intended). The idea is that the courts will give a broader range of equivalents to a pioneer invention. See *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 27 n.4 (1997) (noting the judicial recognition of pioneer inventions); *Cont'l Paper Bag Co. v. E. Paper Bag Co.*, 210 U.S. 405, 415 (1908) (“[A] greater degree of liberality and a wider range of equivalents are permitted where the patent is of a pioneer character than when the invention is simply an improvement, may be the last and successful step, in the art theretofore partially developed by other inventors in the same field.” (quoting *Cimiotti Unhairing Co. v. Am. Fur Ref. Co.*, 198 U.S. 399, 406 (1905))); *Miller v. Eagle Mfg. Co.*, 151 U.S. 186, 207 (1894) (“The range of equivalents depends upon the extent and nature of the invention. If the invention is broad or primary in its character, the range of equivalents will be correspondingly broad, under the liberal construction which the courts give to such inventions.”); *Perkin-Elmer Corp. v. Westinghouse Elec. Corp.*, 822 F.2d 1528, 1532 (Fed. Cir. 1987) (“A pioneer invention is entitled to a broad range of equivalents.”); *In re Hogan*, 559 F.2d 595, 606 (C.C.P.A. 1977) (“[P]ioneers . . . deserve broad claims to the broad concept.”); see also *supra* note 113 (discussing pioneer patents).

¹³⁹ The linkage here is that the quantum of innovation—the “distance” between the patented invention and its prior art—will determine its scope; the greater the innovation, the greater the “distance” from the prior art, and thus the greater potential scope. Typically, these “prior art limitations” on patent scope are associated with the doctrine of equivalents, see, e.g., *Wilson Sporting Goods Co. v. David Geoffrey & Assocs.*, 904 F.2d 677, 684 (Fed. Cir. 1990) (“[Prior art] limits the range of possible equivalents of a claim.”), but in reality, prior art always provides a limit on the scope of claims, 35 U.S.C. §§ 102, 103 (2000) (establishing novelty and non-obvious subject matter as requirements of patentability); see also *K-2 Corp. v. Salomon S.A.*, 191 F.3d 1356, 1367 (Fed. Cir. 1999) (noting that obvious variants of the prior art will limit the scope of the doctrine of equivalents); *Conroy v. Reebok Int'l, Ltd.*, 14 F.3d 1570, 1576 (Fed. Cir. 1994) (“[P]rior art restricts the scope of equivalency that the party alleging infringement under the doctrine of equivalents can assert.”).

also necessitate consideration of some of these factors in parallel, such as whether one of ordinary skill would have: been able to create the invention from the given disclosure, determined that the patentee was actually in possession of the invention, understood the best method of the invention's use, and understood the boundaries of the claims themselves.

Similarly, a patent scope determination is laden with consideration of the quantum of innovation (i.e., the differences between the prior art and the claimed invention),¹⁴⁰ the appropriate meaning of both technical and non-technical language,¹⁴¹ whether certain language or descriptions in the disclosure were intended to limit the claims,¹⁴² and what sorts of things are technologically "equivalent" to elements of the invention.¹⁴³

Thus, a major (and obvious) challenge in the patent administration system is generating an appropriate amount of relevant and reliable information.¹⁴⁴

¹⁴⁰ This determination will be relevant to considerations of whether a patent is to be granted "pioneer" status, *supra* note 113, as well as the ways that variants of the prior art might serve to limit the scope of the patent, *supra* note 139.

¹⁴¹ The general rule is that the "ordinary meaning" of claim language controls, unless the patentee has provided an alternative definition or the term renders the claim unclear. *See, e.g., Johnson Worldwide Assocs., Inc. v. Zebco Corp.*, 175 F.3d 985, 989 (Fed. Cir. 1999) ("The general rule is, of course, that terms in the claim are to be given their ordinary and accustomed meaning."). The ordinary meaning of technology-specific terms is that one of ordinary skill in the art would ascribe to the term. *See, e.g., Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996) (noting that "the words in a claim are generally given their ordinary and customary meaning").

¹⁴² *See, e.g., Renishaw PLC v. Marposs Societa' Per Azioni*, 158 F.3d 1243, 1249-51 (Fed. Cir. 1998) (describing the challenge in determining whether to use language from the specification to inform the meaning of claim terms).

¹⁴³ *See, e.g., Graver Tank & Mfg. Co. v. Linde Air Prods. Co.*, 339 U.S. 605, 609 (1950) ("What constitutes equivalency must be determined against the context of the patent, the prior art, and the particular circumstances of the case. Equivalence, in the patent law, is not the prisoner of a formula and is not an absolute to be considered in a vacuum.").

¹⁴⁴ Jay Kesan and Mark Banik note this problem as well, suggesting that one solution might be to offer issued patents a high presumption of validity over disclosed prior art, thus providing incentives for patentees to produce prior art to the PTO. Jay P. Kesan & Mark Banik, *Patents as Incomplete Contracts: Aligning Incentives for R & D Investment with Incentives to Disclose Prior Art*, 2 WASH. U. J.L. & POL'Y 23, 48-54 (2000). While providing the PTO with additional information is undoubtedly good, the Kesan-Banik mechanism for doing so—strongly privileging the validity decisions of the PTO over those of the courts, *cf. Quad Envtl. Techs. Corp. v. Union Sanitary Dist.*, 946 F.2d 870, 876 (Fed. Cir. 1991) ("The courts are the final arbiter of patent validity and, although courts may take cognizance of, and benefit from, the proceedings before the patent examiner, the question is ultimately for the courts to decide, without deference to the rulings of the patent examiner.")—may be detrimental given the nature of the

b. *Era*

There are many important timeframes—or eras—in which the patent administration system evaluates and enforces the relationship between innovation, disclosure and scope.

First, there are various key dates pertaining to a patent that are used as analytic touchstones frameworks. The quantum of innovation is measured as of the date of invention;¹⁴⁵ certain aspects of the disclosure requirement are viewed as of the filing date.¹⁴⁶

Second, there at least two phases in the patent administration system—prosecution before the PTO, and litigation during an enforcement action in the courts.¹⁴⁷ Patent scope determinations occur during patent prosecution¹⁴⁸ and during litigation (possibly years apart).¹⁴⁹

proceedings before the PTO. For example, the ex parte prosecution process suggests that the PTO may be less likely to conduct a full analysis than courts. Further as I argue in Part III.A *infra*, the same beneficial effect can be achieved by the imposition of a strong form of the prosecution history estoppel rule.

¹⁴⁵ Absent statutory bars, novelty and nonobviousness are measured as of the date of the invention. 35 U.S.C. § 102 (2000) (stating that an inventor is not entitled to a patent, inter alia, if her “invention was known or used by others in this country . . . before the invention thereof by the applicant for patent”); 35 U.S.C. § 103 (2000) (“A patent may not be obtained . . . if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made . . .”). Accordingly, determinations based on the quantum of innovation—such as “pioneer status” or prior art limitations on patent scope—also use this lens. See *supra* note 113 (discussing how some courts have given greater rights for a significant advance over state of the art). Curiously, the written description requirement, like most disclosure requirements, appears to be measured as of the filing date of the patent application, but clearly implicates the intellectual activity surrounding the date of invention. See 3 CHISUM, *supra* note 135, § 7.04 (discussing the goal of written description as confirming the date of invention).

¹⁴⁶ See, e.g., *Transco Prods., Inc. v. Performance Contracting, Inc.*, 38 F.3d 551, 557 (Fed. Cir. 1994) (date for determining compliance with the best mode requirement for reissue application is the filing date of the original application); *In re Glass*, 492 F.2d 1228 (C.C.P.A. 1974) (sufficiency of specifications judged as of the filing date).

¹⁴⁷ It might be argued that there is an intermediate phase of patent analysis which is perhaps as important as the other two: a “public evaluation” phase, where competitors and potential licensees of the patentee evaluate the scope and strength of the patent. This is not considered here, as it is not formally a part of the patent administration process. *But cf.* Lemley, *supra* note 99, at 1497 (exploring whether the PTO phase of administration might be better conducted by private parties).

¹⁴⁸ The patent office will determine the scope of proposed claims in order to evaluate compliance with validity and disclosure requirements. See, e.g., *In re Graves*, 69 F.3d 1147, 1152, (Fed. Cir. 1995) (evaluating the PTO’s claim construction); *In re Eter*, 756 F.2d 852, 858 (Fed. Cir. 1985) (en banc) (noting the PTO’s rules of claim construction); *In re Yamamoto*, 740 F.2d 1569, 1571 (Fed. Cir. 1984) (asserting that the “broadest reasonable interpretation” rule of construction by the PTO “serves the public interest by reducing the possibility that claims, finally allowed, will be given broader

Other determinations, such as “pioneer status” or the application of the doctrine of equivalents, occur only during litigation. Still other analyses appear to occur anytime and no time in particular.¹⁵⁰

This temporal array poses distinct challenges for a patent administration system. First, the maintenance of the relationship between innovation, disclosure, and scope requires the consistent application of the administrative tools, even when the analyses are conducted at different times. For example, consideration of whether the patent scope is appropriately enabled by the disclosure will be conducted both by the PTO and (in theory¹⁵¹) by a court during litigation—using the same analytic timeframe of the filing date as a measuring device.¹⁵² Thus it becomes critical, from a patent administration perspective, to have *both* constant enablement standards, as well as constant information. That is, the only way to ensure that the link between disclosure and scope is being maintained across the phases of patent analysis is to ensure that the information used in the earlier PTO phase is maintained for use during the later litigation phase.

Second, the nature of the analyses conducted calls for *contemporaneous*—or as near as possible—information. Again, consider enablement, which is measured through the lens of the knowledge of the relevant field as of the filing date of the patent application.¹⁵³ As the filing date becomes distant, the potential for cognitive biases, such as a hindsight bias, increases.¹⁵⁴

The combination of informational and temporal challenges noted above poses difficulties for a theory of patent administration based on

scope than is justified”).

¹⁴⁹ Allison & Lemley find the temporal gap between prosecution and litigation to be twelve years on average. Allison & Lemley, *supra* note 100, at 237.

¹⁵⁰ For example, the definiteness requirement.

¹⁵¹ Assuming the patent is litigated, and that invalidity due to lack of enablement is raised, of course.

¹⁵² *Supra* note 146.

¹⁵³ *Id.*

¹⁵⁴ The hindsight bias is defined as the tendency of actors to overestimate the ex-ante prediction that something would happen after it actually did. See Jay J.J. Christensen-Szalanski & Cynthia Fobian Willham, *The Hindsight Bias: A Meta-Analysis*, 48 *ORG. BEHAV. & HUM. DECISION PROCESSES* 147 (1991) (reviewing literature on hindsight bias); Russell B. Korobkin & Thomas S. Ulen, *Law and Behavioral Science: Removing the Rationality Assumption from Law and Economics*, 88 *CAL. L. REV.* 1051, 1095-1100 (2000) (discussing hindsight bias). In the example, here, a hindsight bias would increase the likelihood that the decision maker would uphold the patent, as post-filing technological developments would make the disclosure enabling. See *W.L. Gore & Assoc., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1553 (Fed. Cir. 1983) (discussing the pernicious effects of hindsight in the patent context (there, obviousness analysis)).

enforcing a link between innovation, disclosure, and scope. As the next Part suggests, these problems are (and can be) largely addressed by the application of prosecution history to the analyses.

3. The Centrality of Prosecution History Estoppel

As noted at some length above, the concept of prosecution history estoppel is not new (nor even particularly obscure) in the patent law.¹⁵⁵ What has been seriously misunderstood, however, is the role that prosecution history information plays across the range of issues addressed by the patent administration¹⁵⁶—as well as any analysis of prosecution history within the context of a theory of the patent administration system.

This Part provides that broader view, arguing that prosecution history information is uniquely appropriate to solving the informational and temporal challenges presented by the patent administration system. In addition, prosecution history estoppel itself explicitly links the quantum of innovation to the scope of the patent grant, thereby directly supporting the goals of the patent administration system.

a. *Addressing information and timing*

The argument here is straightforward. Prosecution history information is, by definition, information that is provided by the patentee during prosecution. As such, prosecution history information has several features that address the informational and timing problems noted above:

Accuracy. As suggested above, many, if not all, of the inquiries in a patent administration system will require detailed contextual analyses involving the particular innovation. The single individual or entity¹⁵⁷ with the most accurate and reliable information about the innovation and its technological context—such as its relationship to the prior art,

¹⁵⁵ See generally *supra* Part I.B (summarizing the origins of prosecution history estoppel).

¹⁵⁶ See *supra* Part I (exploring the incompleteness of the current equivalents-centered view). Again, I am not distinguishing here between prosecution history information, and the subset of such information that triggers prosecution history estoppel. See *supra* note 41 and accompanying text (explaining this). As noted above, an important exception to this misunderstanding is Professor Thomas's work on the role of prosecution history information in the claim construction context. Thomas, *supra* note 8, at 190.

¹⁵⁷ In the case of multiple inventors. See, e.g., 35 U.S.C. § 116 (2000) (defining joint inventorship).

for example—is the patentee. Accordingly, we should expect that prosecution history information will be among the most accurate sources available.¹⁵⁸

¹⁵⁸ Professor Thomas suggests that prosecution history information is unlikely to be useful because it is (a) relatively informal; (b) difficult to discern aspects relied upon by the patent examiner; (c) and perhaps subject to manipulation by strategic patentees. Thomas, *supra* note 8, at 200-05. And yet none of these objections truly undermines the utility of prosecution history information. Objections as to the relative informality of the prosecution process are at once circular (if due weight was placed on prosecution histories, patentees would adjust accordingly) and inaccurate. As Thomas himself notes, in a post-*Warner-Jenkinson* world (and even more so in a post-*Festo* world) patentees are clearly taking prosecution histories quite seriously. *Id.* at 200; *see also* Michael Melton, *Patents as Public Notice, or How to Read a Patent Prosecution History*, in *COMPUTER SOFTWARE PROTECTION* 453, 476 (PLI Patents, Trademarks & Literary Prop., Course Handbook Series No. G-479, 1997) (“[A] practitioner should take pains to ensure that the prosecution history can withstand scrutiny . . .”); Mueller, *supra* note 8, at 505-10 (explaining that patents should be drafted and prosecuted in a manner that recognizes the consequences of prosecution history estoppel). In any event, patent practitioner practice before the PTO is under oath. 37 C.F.R. § 1.63 (2001).

Objections as to the scale and scope of prosecution histories are no more availing. Whether a particular argument is relied upon by the examiner or the public is irrelevant to a broad conception of the relevance of prosecution history information. *See supra* Part I.A (describing uses of prosecution history). Thomas is correct, as noted above, that the use of the term “estoppel” is something of a misnomer in this context. *See* Thomas, *supra* note 8, at 202 (“Even a cursory examination reveals that the doctrine of prosecution history analysis is entirely misnamed.”).

The argument that patentees will behave strategically in developing prosecution history information, *see, e.g.*, Mueller, *supra* note 8, at 502-10 (advocating various forms of strategic behavior), is beside the point. There are as likely to be strong incentives to provide accurate information (i.e., to legitimately explain the distinction from a newly discovered piece of prior art) so as to convince the examiner as to provide misleading information to trick a court sometime later. During prosecution, litigation is uncertain and far-off; the rejections by the examiner are a current and meaningful reality. Further, to the extent that patentees provide alternative arguments, *see* Thomas, *supra* note 8, at 203 (“Pragmatic pressures often cause applicants to adopt something of a shotgun approach.”), then they risk being hoisted by the petard of their gamesmanship, so to speak. *See, e.g.*, *Athletic Alternatives, Inc. v. Prince Mfg., Inc.*, 73 F.3d 1573, 1579-80 (Fed. Cir. 1996) (choosing the narrower—and patentee-harmful—interpretation of a claim term that had been given “muddled and contradictory” meanings by the patentee in the prosecution history).

This is not to suggest that the existence and accuracy of prosecution history information requires the privileging of that information over that provided by the claims or the disclosure. *See, e.g.*, 35 U.S.C. § 112 (2000) (requiring patentees to include a “written description of the invention, and of the manner and process of making and using it” that concludes with “one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention”). As noted above, *supra* note 47, suggesting that prosecution history information might be useful is different from arguing that the patent document should give way to such information. Rather, the argument here is that in those cases where resort to non-patent document information is useful (and perhaps necessary), prosecution history is likely to provide a particularly accurate source.

Relevance. Prosecution history information is necessarily directed to aspects of the patented innovation and its context. Accordingly, such information is highly likely to be more directly relevant than any other possible source in that same context.

Contemporaneously generated. Prosecution history is, by definition, generated during the prosecution of the patent. Accordingly, to the extent that information about the then-existing (or nearly-then-existing)¹⁵⁹ state of affairs is required, prosecution history will be useful, and likely to be more useful than many other possible sources, such as post-hoc litigation-driven expert testimony or the like.

From the low-cost producer. There are costs related to the generation of accurate and relevant information. In the context of a particular innovation, the patentee has both access to the most information (e.g., she can best determine the type and form of useful information) and can best avoid socially wasteful information production.¹⁶⁰

Easily collected, maintained, and accessed. Because such information is in essence a record of exchanges with the PTO, prosecution history is easily (and routinely) collected and maintained. Accordingly, prosecution history records are easily obtainable by members of the public.¹⁶¹

These features of prosecution history information make it a uniquely useful candidate for use in inquires related to the relationship between innovation, disclosure, and patent scope. By offering reliable, accessible, contemporaneous, and relevant information, prosecution history information can play an important role in addressing information and timing concerns in a patent administration sys-

¹⁵⁹ See *supra* notes 146-55 and accompanying text (describing the temporal aspects of patent administration analyses).

¹⁶⁰ See, e.g., Ian Ayres & Robert Gertner, *Filling Gaps in Incomplete Contracts: An Economic Theory of Default Rules*, 99 YALE L.J. 87, 94 (1989) (noting the social benefits of producing information from the most informed party to a transaction); Kesan & Banik, *supra* note 144, at 36-37 (suggesting that the patentee is best informed about the prior art in the context of high-technology inventions and should thus be induced to produce information).

¹⁶¹ Access could be better: as Thomas aptly notes, in contrast to the patent documents themselves—which are available from a number of sources and widely publicized—prosecution histories must be specifically ordered from the PTO for a “not inconsequential” fee. Thomas, *supra* note 8, at 201-02. And yet the costs of providing broader access might not be justified in light of the fact that relatively few patents are considered important in the marketplace, and even fewer are actually litigated. See Lemley, *supra* note 99, at 1497 (suggesting that the low numbers of important patents do not justify more stringent review of patent applications by the PTO); see also Merges, *supra* note 5, at 595 (same).

tem¹⁶²—a role that, as noted above, the patent law to a large degree already recognizes.¹⁶³

b. *Supporting the relationship*

In addition to addressing—and perhaps solving—the informational and timing problems in a relationship-centered theory of patent administration, prosecution history estoppel directly supports such a notion, introducing the *patentee's* conception of that relationship.

The argument proceeds as follows. A rule that the patentee cannot recover during an enforcement action any subject matter that she surrendered during the prosecution of the patent¹⁶⁴ means that the actions taken by the patentee during prosecution will directly impact the scope of the right to exclude. In other words, the patentee's view of the relationship between her disclosed invention, the content of the prior art, and the standards of patentability should be credited—and perhaps even dispositive at times—of the patent scope.¹⁶⁵

Such a rule comports well with the goals of the patent administration by producing valuable information about the relationship between innovation, scope, and disclosure. In addition, as noted above, such information has significant advantages such as accuracy and its contemporaneous nature.¹⁶⁶ As this Part has demonstrated, an appropriate view of the role of prosecution history information in the patent administration reveals the central role that such information plays—both in solving difficult informational problems inherent in any system of patent administration, and by directly providing contemporaneous, patentee-provided information about the context of the innovation at issue. The next Part will discuss the application of prosecution history information, especially the use of prosecution history estoppel to limit the scope of the patent grant.

¹⁶² See *supra* Part II.C.2 (discussing these concerns).

¹⁶³ *Supra* Part I.A.

¹⁶⁴ This is the classic statement of prosecution history estoppel. See, e.g., *Keystone Driller Co. v. Northwestern Eng'g Corp.*, 294 U.S. 42, 48 (1935) (“Where . . . broad claims are denied and narrower substituted, the patentee is estopped to read the granted claim as the equivalent of those which were rejected.”); see also 5A CHISUM, *supra* note 23, § 18.05[2][a] (collecting cases).

¹⁶⁵ See *Keystone Driller*, 294 U.S. at 48 (holding the patentee to the narrow interpretation of its claim that it had previously forwarded). See Part III for a discussion of the reasons for crediting prosecution history information.

¹⁶⁶ See *supra* note 158 and accompanying text (discussing the information advantages of prosecution history).

III. THE ROLE OF PROSECUTION HISTORY ESTOPPEL, PART 2: *INCENTIVES*

As argued above, prosecution history estoppel lies at or near the center of the modern patent administration system, providing substantial informational support to the series of detailed and difficult analyses that are conducted to evaluate, grant, and enforce a patent right. This Part provides an affirmative normative defense of this role for prosecution history estoppel, arguing that the use of such information, appropriately understood, is likely to be socially beneficial because prosecution history estoppel also creates important incentives for patentees to act in socially desirable ways.

While it is commonplace to describe prosecution history estoppel as merely a scope-limiting rule,¹⁶⁷ a far more robust and significant theory builds from the understanding of the role of prosecution history estoppel as integral to the patent administration system. As noted above, prosecution history *information* is central to maintaining the relationship between innovation, disclosure, and scope.¹⁶⁸

But the role of prosecution history estoppel as an integral element of the patent administration system has an additional, and perhaps even more important, component: that of providing *incentives* to prospective patentees to engage in activities and behaviors that benefit the patent administration system. To this end, prosecution history estoppel can be conceived as an information-forcing default rule, providing strong incentives to patentees to provide useful information concerning their innovation and its context. Similarly, a robust prosecution history estoppel regime can serve to force patentees to internalize search costs that otherwise are borne less efficiently by the public. And finally, prosecution history estoppel also serves to support the institutional role of the PTO as the body with the most technological expertise in the patent administration. This Part explores each of these insights in turn.

For purposes of this Part, I will assume a strong form of the doctrine of prosecution history estoppel: that the amendment (or perhaps clarification)¹⁶⁹ of patent claims during prosecution will have sig-

¹⁶⁷ See *supra* Part I (arguing that the rule cannot be merely scope-limiting).

¹⁶⁸ See *supra* Part II (discussing the policies animating the patent administration system).

¹⁶⁹ See, e.g., *Festo VI*, 234 F.3d 558, 564-65 (Fed. Cir. 2000) (en banc) (noting that both claim amendments and arguments related to claim scope can create a prosecution history estoppel); see also Thomas, *supra* note 8, at 197 (same).

nificant consequences in the determination of patent scope.¹⁷⁰ In the paradigmatic example, the amendment of a particular claim element would result in no equivalents of that element being extended.¹⁷¹ In Part IV below, I will take up the issue of whether this rule can be relaxed without damage to the incentive scheme.

A. *Prosecution History Estoppel as Information-Forcing*

In cases where the information available to decision makers is incomplete or costly to discover, law and economics scholars have long recognized the importance of establishing default rules that serve social ends. For example, in the area of incomplete contracts, many academics have argued for a series of default rules that represent what the parties to contracts “would have wanted” had they been able to negotiate properly,¹⁷² typically under the theory that in the absence of large transaction costs, parties will reach mutually beneficial arrangements.¹⁷³ Significantly, however, Ian Ayres and Robert Gertner have suggested that the “would have wanted” approach overlooks the opportunity to use the default rules to limit the ability of parties to behave strategically when disclosing material information.¹⁷⁴ That is, Ayres and Gertner posit that a significant source of contractual incompleteness (i.e., a lack of complete information about the bargain that the parties wanted) is *strategic* rather than the result of bargaining or information-collection costs.¹⁷⁵ Put simply, well-informed parties might withhold information that (if known) would allow a more socially beneficial deal, in order to maximize the private gains from the transaction.¹⁷⁶

¹⁷⁰ This is what the various *Festo* opinions described as the “complete bar” rule. See, e.g., *Festo VI*, 235 F.3d at 564 (discussing forms). I discuss choosing among forms of estoppel in Part IV *infra*.

¹⁷¹ *Festo VI*, 234 F.3d at 569.

¹⁷² See, e.g., Frank H. Easterbrook & Daniel R. Fischel, *Limited Liability and the Corporation*, 52 U. CHI. L. REV. 89, 102 (1985) (describing the rule of limited liability as a default rule); Alan Schwartz, *Proposals for Products Liability Reform: A Theoretical Synthesis*, 97 YALE L.J. 353, 361 (1988) (“A default rule . . . resolves disputes according to the contract that most well-informed persons would have adopted if they were to bargain about the matter.”).

¹⁷³ See, e.g., Ayres & Gertner, *supra* note 15, at 88-89 (noting arguments for default rules).

¹⁷⁴ *Id.* at 94; see also POSNER, *supra* note 105, at 140-41 (illustrating strategic behavior with asymmetric information).

¹⁷⁵ Ayres & Gertner, *supra* note 15, at 93-94.

¹⁷⁶ *Id.* at 94.

A recognition that such behavior is socially harmful leads Ayres and Gertner to propose the use of *information-forcing* default rules, rules that provide significant incentives to well-informed parties to provide socially beneficial information.¹⁷⁷ These default rules need not be those the parties would have chosen themselves—indeed, Ayres and Gertner suggest that the best tool might be penalty defaults, those that might be disfavored. These penalty defaults can be avoided (in contractual terms, “contracted around”), allowing parties to choose between the costs of bearing the penalty or producing the information required to avoid the default rule.¹⁷⁸

Prosecution history estoppel easily fits into a theory of penalty default rules.¹⁷⁹ Put simply, a rule that the reduction of patent scope results from the amendment or clarification of claims during prosecution establishes a *penalty* for the failure to produce adequate information at the outset of the prosecution process. And this penalty is only a *default* condition: patentees can avoid it by producing such information, or can choose to absorb the penalty. I unpack this argument below.

1. Incomplete Information

The administration of the patent system, as I have argued above, is primarily occupied with the problem of incomplete information, particularly information about the relationship between innovation, scope, and disclosure.¹⁸⁰ Virtually all parties involved in the patent administration system—the PTO, competitors, the public, and the

¹⁷⁷ *Id.* at 97.

¹⁷⁸ *Id.* at 94-95.

¹⁷⁹ Kesan and Banik similarly suggest that the patent law can be informed by the literature of incomplete contracts. Kesan & Banik, *supra* note 144, at 23-34. To that end, they suggest a rule (at least in high technology contexts) that provides incentives to patentees to conduct prior art searches in exchange for an additional presumption of validity as against the discovered prior art. *Id.* at 26-27. Modeling such a rule, they argue that it is likely to be socially optimal because it both benefits the patentees and provides additional information to the patent office.

I am intrigued by Kesan and Banik’s proposal and agree that solving the information gap problem is crucial to patent policy. Given the existence of prosecution history estoppel, however, it is not clear that any additional incentives are needed to procure additional information. Furthermore, the information that is *most* likely to be asymmetric in favor of the patentee (and thus most desirable to stimulate the production of) is not necessarily prior art information, but instead information about the claimed invention and its context. The Kesan and Banik proposal would not automatically increase the production of that sort of information.

¹⁸⁰ See *supra* Part II.B (explaining this further).

courts—are substantially underinformed about this central question and its variants (e.g. whether a patent's scope will cover an accused device).¹⁸¹ To some degree, this is a function of the inherent ambiguity in the use of language to describe inventions,¹⁸² and it is unrealistic to expect that all uncertainty can be removed. Yet there can be little doubt that additional information would likely result in better evaluations, at least if the cost of providing that additional information is relatively low.

2. A Well-Informed Participant

Among the “parties” to the patent transaction, the patentee is either the best informed or the one who can most easily and cheaply become the best informed¹⁸³ about the context of her innovation. Consider prior art: as several commentators have noted, the PTO, despite efforts to the contrary, is likely to be underinformed, especially

¹⁸¹ Lemley notes that the PTO is inherently underinformed, and presents a defense of that condition as being cost-justified. Lemley, *supra* note 99, at 1499-1511.

¹⁸² As noted in *Autogiro Co. of America v. United States*, 384 F.2d 391 (Ct. Cl. 1967): An invention exists most importantly as a tangible structure or a series of drawings. A verbal portrayal is usually an afterthought written to satisfy the requirements of patent law. This conversion of machine to words allows for unintended idea gaps which cannot be satisfactorily filled. Often the invention is novel and words do not exist to describe it. The dictionary does not always keep abreast of the inventor. It cannot. Things are not made for the sake of words, but words for things.

Id. at 397.

¹⁸³ The patent law does not assume that a patentee is of any particular skill in the art, *see, e.g.*, *Kimberly-Clark Corp. v. Johnson & Johnson*, 745 F.2d 1437, 1453-54 (Fed. Cir. 1984) (stating that since 1953, there has been no presumption that the inventor is familiar with prior art), thus it might be argued that the assumption that the patentee is best able to become informed, say about the prior art, is unreasonable, *see, e.g.*, *Festo VI*, 234 F.3d 558, 624 (Fed. Cir. 2000) (en banc) (Linn, J., concurring in part and dissenting in part) (suggesting that the costs of prior art searches for patentees will be unreasonable). And yet this objection fails to suggest a socially better locus for this cost.

Lemley's important work on the costs and benefits of ensuring patent validity during the prosecution process might provide an answer. *E.g.*, Lemley, *supra* note 99, at 1499-1508. Rather than forcing all patentees to conduct prior art searches—and thereby absorb that cost—shifting that cost to competitors (who will then choose only a small subset of patents to conduct searches on) might be efficient. *Id.* And yet it is not clear whether this would hold any advantage over an estoppel-induced default rule. Patentees, who are likely to be relatively well-informed about the importance of their patent, can choose whether or not to avoid the penalty. Second, the costs of litigation (which must include the risks of incorrect results and costs of uncertainty) are quite likely to result in the dramatic undersearching of prior art by competitors.

in many technological areas.¹⁸⁴ Competitors or the public more generally will have incentives to become informed, but only after the patent issues and appears to be a threat. And the public is unlikely to be as well-positioned as the patentee to lower the costs of searching for prior art.

Furthermore, there are a number of questions in the patent law in which the information may only be usefully obtainable from the patentee. A clear case of this is the claimed invention's relationship to the prior art, and, relatedly, its scope. For while the patentee is explicitly required to use the claims as clear explanation of scope,¹⁸⁵ claim language must still be interpreted.¹⁸⁶ Furthermore, the patent law recognizes that the scope of an invention is commensurate with the *invention*, not just the claim language.¹⁸⁷ The patentee is in full possession, during and prior to prosecution, of this information; the rules and tools used in the patent law are efforts to recreate this knowledge.¹⁸⁸

3. Strategic Behavior

Given the asymmetry of information, the incentives for a patentee to fail to produce relevant information are substantial.¹⁸⁹ Even assuming that an invalid patent would either be "costless" because it re-

¹⁸⁴ See, e.g., Kesan & Banik, *supra* note 144, at 26 (discussing the likelihood that the PTO is underinformed regarding prior art in high-technology patents); Lemley, *supra* note 99, at 1499 (noting that the prosecution process involves "surprisingly little actual assessment of whether a patent should issue"); Merges, *supra* note 5, at 595 (noting the high risk of error at the PTO).

¹⁸⁵ 35 U.S.C. § 112 (2000).

¹⁸⁶ See, e.g., *Johnson Worldwide Assocs., Inc. v. Zebco Corp.*, 175 F.3d 985, 989-92 (Fed. Cir. 1999) (describing and utilizing the tools of claim construction).

¹⁸⁷ See, e.g., *Graver Tank & Mfg. Co. v. Linde Air Prods. Co.*, 339 U.S. 605, 607 (1950) ("[C]ourts have also recognized that 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."):

¹⁸⁸ See, e.g., *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 27 (1997) (discussing rules for doctrine of equivalents as they relate to the patentee's intent); *Johnson Worldwide Assocs.*, 175 F.3d at 989-92 (discussing rules for claim construction).

¹⁸⁹ Patentees are forbidden from misleading the PTO or affirmatively withholding material information, 37 C.F.R. § 1.156 (2001), so outright lying is not really an issue. However, the rules do not require that the patentee perform a prior art search, draw her initial claims narrowly to the boundaries of the prior art, or provide additional contextual information relating to the scope of the patent.

mained unused,¹⁹⁰ or eventually was struck down by a court, the presumption of validity and the high costs of patent litigation offer strong incentives for the patentee to affirmatively avoid producing information relating to patent scope—that is, precisely the sort of information that might allow the PTO and the public to more usefully evaluate the scope of the patent.¹⁹¹ Furthermore, to the extent that some information is either singularly in the possession of the patentee or is very costly (in terms of actual costs of production, error costs, uncertainty, etc.),¹⁹² then the possibility of producing that information absent patentee production greatly diminishes. This raises the possibility that invalid or otherwise inappropriately broad patents would survive to distort the marketplace.

In any case, the patentee has both the motive and the opportunity to behave strategically. Such behavior can take many forms. It might involve declining to conduct a thorough prior art search, thus transferring this cost to the public as well as increasing the possibility that the PTO will “miss something” and allow the unwarranted scope.¹⁹³ Perhaps a patentee will draw inappropriately broad claims, hoping that the prosecution process will only minimally (if at all) pare the

¹⁹⁰ Most issued patents are not asserted or licensed. See, e.g., Lemley, *supra* note 99, at 1503 (noting that many patents either lapse for failure to pay maintenance fees, or are never litigated). Accordingly, such patents, even if technically invalid, would not cause social harm in the marketplace. *Id.*

¹⁹¹ Patentees with invalid patents should be able to settle cases with rational market players for slightly less than the cost of litigation, which in the patent field averages \$2 million—or at least an order of magnitude greater than typical prosecution costs. *Id.* at 1502 n.28. Also note that an issued patent in a given field might be used as a threat against many market players.

¹⁹² See *supra* note 183 and accompanying text (asserting that the patentee is in the best position to provide information).

¹⁹³ Note in this regard that the present patent law might be affirmatively suboptimal by creating incentives for a patentee not to become fully informed prior to filing the patent. The doctrine of inequitable conduct can be used as a defense to infringement where a patentee has either misled or failed to disclose material information to the PTO. See, e.g., *J.P. Stevens & Co. v. Lex Tex Ltd.*, 747 F.2d 1553, 1559-60 (Fed. Cir. 1984) (holding that the infringed patent was unenforceable on inequitable conduct grounds). Importantly, the Federal Circuit has established a test that allows for even very low levels of intent to trigger inequitable conduct, given the nondisclosure of important enough information. *Id.* Thus, if a patentee conducted an extensive prior art search, and noted only the relevant materials uncovered to the examiner, she might be vulnerable to an inequitable conduct charge if it turned out that a non-disclosed reference was somewhat important. On the other hand, if the patentee revealed all the materials—relevant and irrelevant—then she might again be vulnerable: this time to a charge that she “buried” the relevant references.

claims back, thus yielding additional scope.¹⁹⁴ Perhaps a patentee will vaguely describe her invention in the claims or in order to introduce uncertainty about the scope of her patent. Perhaps (in the absence of a meaningful estoppel rule) the patentee will accede to changes imposed by the PTO, but later seek to “undo” such acts during litigation. The common thread here is that the patentee is failing to provide information relevant to the evaluation of her patent grant, thus creating or exacerbating the “incomplete information” problem that so much of the patent administration system seeks to solve.¹⁹⁵

4. Penalizing Underproduction

As noted above, the modern patent administration system contains the essential features of what Ayres and Gertner suggest is strategic behavior that results in incomplete information. Thus, the appropriate response is the penalty default rule of prosecution history estoppel: to the extent that patentees underproduce information when applying for a patent, they will incur penalty costs relating to the information that they are forced to provide by the prosecution process. Thus, amendments, arguments, or clarifications relating to various aspects of patentability—claim scope, relationship between the invention and the prior art, the meaning of particular claim terms, and clarity of disclosure—should (and under *Festo VII*, will)¹⁹⁶ impose penalties on patentees. As Ayres and Gertner suggest, however,¹⁹⁷ these

¹⁹⁴ In some ways, the patent prosecution process looks like a negotiation session between the patentee/applicant and the examiner. To this end, note that studies have shown that negotiators that adopt aggressive or even extreme opening positions achieve more of their goals. See, e.g., Jerome M. Chertkoff & Melinda Conley, *Opening Offer and Frequency of Concession as Bargaining Strategies*, 7 J. PERSONALITY & SOC. PSYCHOL. 181 (1967) (explaining an empirical study supporting this proposition); Grant T. Savage et al., *Considering Both Relationships and Substance when Negotiating Strategically*, in LEWICKI ET AL., *NEGOTIATION: READINGS, EXERCISES, AND CASES* 63 (2d ed. 1993) (explaining the results of a study on negotiation strategies that depending on the positions of the parties); Tutzauer, *Bargaining Outcome, Bargaining Process, and the Role of Communication*, 10 PROGRESS IN COMM. SCI. 257 (1991) (explaining why this might be so); Laurie Weingart et al., *Tactical Behaviors and Negotiation Outcomes*, 1 INT'L J. OF CONFLICT MGMT. 7 (1990); see also *Lyon v. Boh*, 1 F.2d 48, 50 (S.D.N.Y. 1924) (Hand, J.) (“[T]he antlike persistency of [patent] solicitors has overcome, and I suppose will continue to overcome, the patience of examiners, and there is apparently always but one outcome.”), *rev'd*, 10 F.2d 30 (2d Cir. 1926).

¹⁹⁵ See *supra* Part II (describing the patent administration system’s goal of collecting information).

¹⁹⁶ *Festo VII*, 122 S. Ct. 1831, 1835 (2002).

¹⁹⁷ See Ayres & Gertner, *supra* note 15, at 94-95 (noting the importance of the ability to “contract around” default rules).

penalties are only the default condition; patentees can avoid them by producing the necessary information.

Such penalty-avoidance tactics might include narrowing original claim language to comport better with limits established by prior art and the disclosure requirements—thus avoiding the necessity of amendment or argument during prosecution.¹⁹⁸ Patentees might define terms in their claims more clearly, so as to avoid costly misunderstandings with the PTO regarding their scope. Alternatively, patentees might provide additional teachings in their patent document, thereby providing support for the breadth of claims desired. There are certainly many more possibilities, all of which direct patentees to carefully consider the standards of patentability at the time of application and provide the PTO (and thus the public) with the informational tools needed to properly evaluate the patent—thus serving the policy goals of addressing the incomplete information problem.

There are likely to be a number of objections to a theory of prosecution history estoppel as a default penalty rule.¹⁹⁹

Costs. First, there is a class of arguments related to the perceived status quo of the patent prosecution process. These arguments suggest that the costs “imposed” by the default penalty rule will substantially diminish access to the patent system.²⁰⁰ And yet these contentions fall under their own weight: a default penalty rule would clearly change the cost analysis for a patentee, and thus change the status quo of patent prosecution.²⁰¹ But the default penalty rule is just that—

¹⁹⁸ See 35 U.S.C. §§ 102, 103 (2000) (establishing the prior art limitations); 35 U.S.C. § 112 (2000) (establishing the disclosure requirements). This suggestion, of course, implies a prior art search.

¹⁹⁹ Judge Linn of the Federal Circuit has clearly been the most effective and articulate voice against the strong form of prosecution history estoppel. *E.g., Festo VI*, 234 F.3d at 620-30 (Linn, J., concurring in part and dissenting in part) (criticizing the complete bar rule).

²⁰⁰ See *id.* at 624 (Linn, J., concurring in part and dissenting in part) (“[T]he majority’s new rule will substantially increase the cost of obtaining patent protection . . .”).

²⁰¹ For these reasons, I agree with Judge Linn that prospective patentees would have to very carefully consider the costs and benefits of (a) seeking the earliest possible filing date, perhaps at the cost of necessitating later amendment of the claims (and thus the penalty default rule), see *id.* at 622 (arguing that an early filing will increase chances of claim amendments); (b) avoiding a comprehensive prior art search, thus increasing the possibility that an inventor would be surprised by prior art discovered by the PTO, see *id.* at 624 (arguing that an inventor might not know of all relevant prior art until prosecution); and (c) offering original claims that are relatively vague and ambiguous, requiring later clarification, see *id.* at 622-24 (arguing that clarifying claim amendments are often necessary). Over the long term, prosecution history estoppel as

a default—and prospective patentees would have the option of deciding whether to reduce the costs and accept the possible default rule penalty, or seek ways to avoid the penalty.²⁰² And questions of cost location beg the question of why the public should subsidize the production of such information,²⁰³ especially when it appears that the prospective patentee is in the best position to cheaply produce it.

Literalism. A second group of arguments contend that the penalty default rule is inappropriate in the particularities of the patent context. Thus, the argument would follow, the “inherent limitations of language”²⁰⁴ would mean that the fit between the patent claim and the actual invention would be inexact, necessitating both a scope of “equivalents” and allowance for multiple claim amendments.²⁰⁵ This argument too is unconvincing. There is no question that claim drafting is a difficult and imprecise business. And yet the statute²⁰⁶ and public policy²⁰⁷ demand that such imprecision (which is, of course, just another version of incomplete information) be reduced as much as possible. And thus if the policy goal is one of reducing the “limitations of language” to a minimum, the patentee is clearly in the best possible position to do so, either by carefully drafting precise claims in the first instance, or by drafting any amended claims to cover the full permissible scope of the invention, obviating resort to equivalents altogether. In other words, the penalty default rule operates here to encourage crisp and considered drafting of *both* original and amended

a default penalty rule will *undoubtedly* impact the behavior of prospective patentees. But that’s the point; as noted above, patentees are making strategic choices respecting the production of valuable information related to patentability. The purpose of a penalty default rule is to force them to consider the costs of such strategic choices.

²⁰² See, e.g., Ayres & Gertner, *supra* note 15, at 112-13 (noting that parties will choose strategically whether to avoid penalty default rules); see also *supra* note 89 and accompanying text (describing ways to avoid prosecution history estoppel).

²⁰³ See *infra* Part III.B. (discussing the prosecution externality).

²⁰⁴ *Festo VI*, 234 F.3d at 621 (Linn, J., concurring in part and dissenting in part).

²⁰⁵ Indeed, this appears to be the basic objection to the *Festo VI* rule voiced by the Supreme Court. See *Festo VII*, 122 S. Ct. 1831, 1841 (2002) (“[T]here is no more reason for holding the patentee to the literal terms of an amended claim than there is for abolishing the doctrine of equivalents altogether and holding every patentee to the literal terms of the patent.”).

²⁰⁶ See 35 U.S.C. § 112, para. 2 (2000) (requiring “clarity” and “precision” in claim language).

²⁰⁷ See, e.g., Kieff, *supra* note 10, at 732-33 (endorsing Merges’s arguments); Merges, *supra* note 12, at 2664 (noting the advantages of using property rules for patents). But see Ian Ayres & Paul Klemperer, *Limiting Patentees’ Market Power Without Reducing Innovation Incentives: The Perverse Benefits of Uncertainty and Non-Injunctive Remedies*, 97 MICH. L. REV. 985, 986-89 (1999) (arguing for less-clear rules to avoid the market effects of an absolute right to exclude).

claims: in original claims to avoid later amendments and in amended claims to minimize the potential loss from imposition of the prosecution history estoppel penalty. Thus, objections to the default penalty rule based on the nature of “language” are simply unavailing.

Imperfect Information. An argument related to literalism is that, despite her efforts, the patentee simply cannot achieve perfect information about the context of her invention. For example, a particularly important piece of prior art may only become available after the application has been filed, or it may be impossible to foresee the full implications of a scope-reducing claim amendment. Thus, patentees may be penalized by the default penalty rule despite taking steps (such as informing themselves) to avoid it. The answer to this concern is to understand that costs related to imperfect information exist whether we impose them on the patentee or the wider public. Thus the operative question is how best to allocate the cost, by considering which of the parties involved is best positioned to reduce the costs as much as possible. As I have suggested above, the patentee is clearly in the best position to deal with the production of information related to the invention.²⁰⁸ Thus allocating the cost of imperfect information to the patentee will ensure that it is minimized, and avoid costly and uncertain ex post evaluations of whether the patentee could have or should have produced the missing information.²⁰⁹

Information Reduction. A fourth important objection to prosecution history estoppel as a default penalty rule is that it will not actually produce the additional information desired. There are various arguments in this regard. First, the default penalty rule will likely diminish the willingness of patentees to provide information via claim amendments, thus resulting, perhaps, in a choice between claims that have been given no context by the patentee versus claims that, as amended, contain more information.²¹⁰ Second, a predictable response of pat-

²⁰⁸ See *supra* notes 197-200 and accompanying text (discussing costs and how patentees can avoid them).

²⁰⁹ Thus, it is not an answer to suggest that the effect of estoppel should be limited to cases where the patentee could “foresee” the scope-reducing effects of an amendment. *But see* Conigliaro et al., *supra* note 8, at 1049 (arguing in favor of a foreseeability rule). Such a rule does not guarantee that the cost of imperfect information would be thoroughly minimized, as the patentee is only required to consider what might be “reasonable.” Further, the foreseeability rule imposes significant ex post decision-making costs—in determining what sorts of things were “foreseeable” under particular circumstances.

²¹⁰ See *Festo VI*, 234 F.3d at 626 (Linn, J., concurring in part and dissenting in part) (“Paradoxically, the scope and meaning of claim limitations may be more easily

entees will be to file a greater number of narrower claims, so as to preserve as many original claims (and thus achieve as much scope as possible).²¹¹

Yet again these objections miss the mark. As to the first, one important feature of the default penalty rule is to encourage the production of relevant information at the *outset* of prosecution; there are clear incentives already in place to provide relevant information (if needed) *during* prosecution—the patent would be rejected otherwise. And one suspects that the importance of avoiding amendments will result in, if anything, more argument (i.e., information) of value. Furthermore, that amended claims provide additional information is obvious; the real question is how to interpret that information. The default penalty rule of prosecution history estoppel interprets such information as ruling out the extension of the doctrine of equivalents; alternative rules turn the additional information into yet another conundrum.²¹²

As to the second objection noted above, the filing of many narrowly drawn claims instead of fewer, broader ones would seem to be socially beneficial. By carefully defining the invention in several different ways, the patentee is obviously more likely to accurately describe the appropriate scope of invention. Thus, such claims will provide the public with *more* information, not less: as better-drawn claims, they will require less resort to the doctrine of equivalents²¹³ (and may have less room in which to engage equivalents anyway).²¹⁴

discerned for amended limitations, as compared with originally drafted claim limitations, based on the record developed during prosecution.”).

²¹¹ See *id.* at 624 (Linn, J., concurring in part and dissenting in part) (arguing that the *Festo* rule would increase costs of prosecution because patentees would have to file numerous narrow claims instead of fewer broader ones).

²¹² See *id.* at 628 (Linn, J., concurring in part and dissenting in part) (conceding that determining the scope of equivalents under pre-*Festo* VI rules was “arduous” and “difficult and complex”); see also *id.* at 574-75 (“Our decision to reject the flexible bar approach . . . comes after nearly twenty years of experience [applying the rule] . . . [I]t is virtually impossible to predict before the decision on appeal where the line of surrender is drawn.”).

²¹³ The idea here is that as literal claim language approaches the “correct” scope of the invention—that scope which accurately reflects the innovation disclosed in the patent, and avoids entanglement with the prior art—the importance of the doctrine of equivalents fades. Cf. *Graver Tank & Mfg. Co. v. Linde Air Prods. Co.*, 339 U.S. 605, 607-09 (1950) (explaining the doctrine of equivalents); *Winans v. Denmead*, 56 U.S. (15 How.) 330, 341-42 (1853) (noting the need to grant the patentee the scope of the innovation, irrespective of a strict reading of claim language).

²¹⁴ As the literal language of the claim approaches the boundaries established by the prior art (and obvious variants thereof), there will necessarily be less room for the

Problems with the PTO. Another significant objection to the default penalty approach to prosecution history estoppel is that it assumes that the PTO will respond properly to the additional information. That is, even given the appropriate information, the PTO might inappropriately reject claims, potentially replacing the “default” rules with “de facto” rules. (This is especially true given incentives within the PTO, where examiners are given administrative “credit” for imposing initial rejections, and then allowing the patent to issue.)²¹⁵ Conversely, in a regime where amendments are more costly in terms of patent scope, patentees would more vigorously press the PTO to issue unamended claims, perhaps resulting in the granting of overly broad claims. Here again, the incentives will help ensure that the patentee seeks redress for inappropriate rejections, perhaps via appeals to the Federal Circuit, and will increase the opportunity for discipline and standardization. Concerns about inappropriate allowances are valid; however, I am skeptical of whether the failings of the PTO in this particular area justify removing or reducing the beneficial incentives of the penalty default rule. To the extent that a default penalty approach highlights problems with the PTO itself, then it suggests increasing incentives to fix it.²¹⁶

In its incentive-producing role,²¹⁷ prosecution history estoppel is perhaps best viewed as an information-forcing default penalty rule.²¹⁸ By imposing a penalty of limiting patent scope, the rule encourages patentees to take information-producing (and thus socially beneficial) steps to avoid the penalty. Under such a view, prosecution history estoppel becomes an important tool for the reform of the patent prosecution process, a subject to which I now turn.

doctrine of equivalents to operate. *See, e.g.,* *Wilson Sporting Goods Co. v. David Geoffrey & Assocs.*, 904 F.2d 677, 684 (Fed. Cir. 1990) (holding that the doctrine of equivalents cannot be used to capture subject matter in the prior art).

²¹⁵ *See, e.g.,* Lemley, *supra* note 99, at 1496 n.3 (describing the internal administrative incentives for examiners); *see also* Merges, *supra* note 5, at 590 (discussing the incentive structure within the PTO as it relates to the increased volume of patent applications).

²¹⁶ Of course, I am aware that PTO reform is necessarily prospective in nature, and thus this argument does not address the plight of pending patents that may have been harmed by past bad practices at the PTO. This is clearly of concern, though as I have noted in Part I above, the real effects are likely to be quite small. *Supra* notes 89-99 and accompanying text.

²¹⁷ As opposed to its information-producing role. *See generally supra* Part II (discussing information provided by prosecution history estoppel).

²¹⁸ *See, e.g.,* Ayres & Gertner, *supra* note 15, at 97 (“[T]hrough the process of ‘contracting around’ penalty default rules, information is revealed to parties both inside and outside of the contract.”).

B. *The Prosecution Externality*

As I suggested in the Part above, the patent prosecution system offers a number of possibilities for strategic behavior on the part of patentees with respect to information disclosure.²¹⁹ Thus, prosecution history estoppel—an information-forcing penalty default rule—provides an important tool for countering the incentives to behave strategically.

In this Part, I want briefly to sketch a related but distinct argument: that a rule of prosecution history estoppel can help minimize what I describe as the “prosecution externality,” a series of costs that patentees impose upon society as a result of underproducing relevant information. That is, in its incentive-creation role, prosecution history estoppel can force patentees to internalize additional informational costs related to patent administration—justifying the rule either in economic or distributional terms.

The argument here is straightforward and builds substantially upon points made above. An externality is a social cost of a particular activity that is not taken into consideration by the creator of that cost.²²⁰ In the patent administration context, patentees have little incentive (absent prosecution history estoppel, of course) to provide full information related to the relationship between their innovation, their disclosure, and the appropriate scope of their patent, given standards of patentability.²²¹ This information is costly—or perhaps even impossible—to produce absent full participation by the patentee.²²² Thus, this information cost—which includes both the costs of actually producing the information plus the costs of uncertainty or error that accrue as a result of missing or inaccurate information—is borne by the public, first in the form of the PTO²²³ and later by the public more generally. Thus the observation of the *prosecution externality*: significant informational costs of patent prosecution are not con-

²¹⁹ See *supra* notes 90-93 and accompanying text (explaining this).

²²⁰ See, e.g., ROBERT S. PINDYCK & DANIEL L. RUBINFELD, MICROECONOMICS 627-28 (3d ed. 1995) (describing externalities and their effect on the marketplace).

²²¹ As I noted in Part III above, these concerns include: disincentives to conduct thorough (or, indeed, any) prior art searches; disincentives to draft original claims to avoid prior art; and disincentives to draft original claims so as to comport well with § 112 disclosure requirements. *Supra* notes 193-98 and accompanying text.

²²² See *supra* notes 180-89 and accompanying text (discussing certain types of information that are uniquely in the possession of the patentee).

²²³ The PTO is tasked with evaluating patent applications in light of patentability standards, and issuing patents that are deemed compliant. See 35 U.S.C. § 6 (2000) (establishing the duties of the Patent Commissioner).

sidered by patentees, thus the costs are borne by society rather than being reflected in the cost-benefit calculation of the patentee.

Consider the hypothetical example of a prospective patentee who files an application generally disclosing a device used for personal transportation. As might be expected, there are a great number of similar devices in the prior art. The patentee, however, has little incentive (absent prosecution history estoppel) to conduct a prior art search and to tailor her claims accordingly;²²⁴ thus, she originally claims “a personal transportation device with a plurality of wheels and a means for locomotion”—a claim that is both unpatentable under the prior art, and is well beyond the scope of her disclosure, which reveals a rather specific type of five-wheeled machine with a small electric motor. Assume that it is likely that the invention is patentable, if the claims are drawn to “a personal transportation device with five wheels and a small electric motor.”

In adopting this strategy of prosecution, which is perfectly legal and rational—absent a meaningful application of the doctrine of equivalents, the patentee has failed to consider several important costs. First, the PTO will have to conduct an extensive prior art search, evaluating the relevant prior art in light of the original claims.²²⁵ Second, the PTO will have to consider the relationship between the proposed claims and the disclosure, determining whether those of ordinary skill would be able to practice the invention given the disclosure²²⁶ and whether those of ordinary skill would understand that the patentee was in possession of the information.²²⁷ Each of these inquiries has significant costs in terms of time and/or error rate.²²⁸ Costs in time relate to the opportunity cost of the assigned examiner working on another application. Costs in terms of error rate refers to the costs incurred by society when invalid patents are issued

²²⁴ *Supra* notes 193-98 and accompanying text.

²²⁵ Note here that the broader the original claims, the broader the scope of the prior art search—and thus the more costly and time-consuming.

²²⁶ See *supra* note 127 (introducing the enablement requirement).

²²⁷ See *supra* note 128 (introducing the written description requirement).

²²⁸ The breadth of the “gap” between the original claim and what meets the standards of patentability is unquestionably related to the costs incurred by the PTO. Thus, while the PTO will conduct such evaluations in any case, it is unquestionable that circumstances where the proposed language is markedly distinct from that which would comport with the standards of patentability will be especially costly—perhaps in a nonlinear relationship. For example, as I observed in note 225 above, broader original claims will result in a much greater search scope, and a correspondingly greater task to identify prior art truly relevant to the patentable scope of the claims.

by the PTO.²²⁹ In neither case will these costs be adequately considered (if at all) by our prospective patentee—absent some incentive mechanism to do so.²³⁰

A robust conception of prosecution history estoppel provides incentives for the patentee to internalize these information costs; by producing information related to the context of the innovation, disclosing adequately, and claiming appropriately, the patentee can avoid the prospect of scope-limiting claim amendments or clarifications.²³¹ Such internalization is likely to be economically efficient, as it will result in less underproduction of the critical information.²³²

Note of course, that a view of prosecution history estoppel as addressing the prosecution externality is imperfect, as a more direct way to achieve this internalization of the costs would be via direct regulation. For example, legislation or regulation could affirmatively require prior art searches by patentees, claim language might be rendered unchangeable during the prosecution process,²³³ and so forth.

²²⁹ Lemley argues that the costs resulting from the issue of invalid patents are likely to be less than the costs required to have the PTO avoid all errors. Lemley, *supra* note 99, at 1149. Lemley's point is that only some of the invalid patents will be important to the marketplace, and thus only those few will require the ex ante costs of litigation to invalidate them; however, Lemley compares the costs of production of the relevant information as compared to the costs of litigation. *Id.* at 1501-08. Here, the argument is that the (likely lower) costs of production by the *patentees themselves* better achieves the goal of providing the relevant information to the marketplace. Admittedly, to the extent that the patentee either does not have, or cannot efficiently develop the information, then Lemley's point becomes more salient.

In any event, it can scarcely be argued that the issue of invalid patents has some negative effect on society. See, e.g., LESSIG, *supra* note 5, at 210 (criticizing the issue of potentially invalid patents).

²³⁰ Indeed, as I argued above, *supra* note 193 and accompanying text, the patentee may consider this cost-shifting to be a great benefit of the present patent system, allowing strategic behavior in the prosecution process to supplement or replace actual inventive activity.

²³¹ See *supra* note 198 and accompanying text (advancing similar arguments).

²³² See PINDYCK & RUBINFELD, *supra* note 220, at 626-28 (discussing the benefits of reducing externalities). An argument might be made that this will result in less patenting behavior generally. That is, if the risk-return calculation on the costs of seeking a patent includes the benefit (to the patentee) of avoiding these information costs, then the patentee is more likely to seek a patent than in the case where the costs must be recognized. This is a valid concern, but simply points out the question of whether the additional costs to the patentee will dissuade meritorious patenting to a degree that outpaces the costs to society resulting from the externality. This seems quite unlikely: the costs of obtaining a patent, even under a prosecution history estoppel regime, are likely to be far less than the returns from a commercially successful patent.

²³³ This is much like the requirement that no "new matter" may be added to a pending patent application. 35 U.S.C. § 132 (2000).

In contrast, under the prosecution history estoppel framework, the patentee would be offered the choice of internalizing the information costs or accepting the patent scope costs that accrue from prosecution history estoppel. Thus, the prosecution history estoppel rule is only an approximation of the more direct method—whether it operates as effectively would depend upon the relative costs of information production and loss of scope. In cases where information production costs dominate any potential loss of scope, patentees may choose to continue to externalize such costs and vice-versa—though at least forcing the consideration of such costs is likely to be useful. Accordingly, from an economic perspective, the view of prosecution history estoppel as an information-forcing default rule is likely to be better.

But there may be substantial distributional justifications for viewing prosecution history estoppel as addressing the prosecution subsidy. That is, society may consider it unfair that patentees are allowed to supplement the potential commercial rewards offered by the patent system with the externalization of substantial information costs.²³⁴ Thus, prosecution history estoppel, by reducing (if not entirely eliminating²³⁵) the prosecution subsidy, may be instrumental in righting the balance struck between inventors and society.²³⁶

C. *Enforcing Institutional Arrangements*

A third compelling view of prosecution history estoppel in its incentive-creation role is one where the rule is instrumental in maintaining and enforcing the respective roles of the United States Patent and Trademark Office and the federal judiciary. This argument suggests that prosecution history estoppel, by elevating the stakes in the PTO's decision-making process, will result in better discipline of the Office in its patent administration function.

The patent administration system establishes the PTO as, essentially, the initial arbiter of validity standards.²³⁷ The standards, how-

²³⁴ See, e.g., LESSIG, *supra* note 5, at 209 (criticizing patents as tools of large corporations to exclude competitors).

²³⁵ See *supra* note 233 and accompanying text (explaining why prosecution history estoppel is not the same as directly requiring internalization).

²³⁶ See, e.g., *Bonito Boats, Inc. v. Thunder Craft Boats, Inc.*, 489 U.S. 141, 146 (1989) (discussing the “careful balance” between inventors and society).

²³⁷ See 35 U.S.C. § 6 (2000) (establishing the duties of the Patent Commissioner); see also *Dickinson v. Zurko*, 527 U.S. 150, 154 (1999) (discussing the administrative role of the PTO); Craig Allen Nard, *Deference, Defiance, and the Useful Arts*, 56 OHIO ST. L.J.

ever, are those established by Congress, as interpreted by the Federal Courts—especially the United States Court of Appeals for the Federal Circuit.²³⁸ Thus the patent administration system establishes an administrative hierarchy: the PTO's decisions to either deny or grant a patent are reviewable by the courts.²³⁹

Accordingly, because the standards are established by the judiciary (largely via their interpretation of Congressional enactments), it may be inefficient if the PTO was operating under validity standards that were markedly different from those established by the judiciary. Lemley has argued, however, that the costs of detailed validity determinations for all patents is greater than the costs of determination via litigation for those few patents that matter in the marketplace.²⁴⁰ His argument thus suggests that disciplining the PTO may not be cost effective. Here, however, I discuss the value of disciplining the PTO primarily in its decisions to *reject* patents (or particular claim language). That is, the cost of a widely divergent PTO is not simply that *too many* patents are issued, but that *too few* patents are issued as well. That is, an error-prone PTO increases the *variance* in decision making, not merely the quantity of inappropriately issued patents. Thus, because a strong prosecution history estoppel rule will create strong incentives for patentees whose patents (or particular claim language) have been rejected to appeal those rejections to the judiciary, the PTO's decision-making processes can be better disciplined. Further, such an argument comports as well with Lemley's observations, as the patentee will be in the best position²⁴¹ to calculate the cost-benefit of fighting any particular rejection—with the alternative perhaps being the amendment of the claim (and the consequent loss of scope via

1415, 1441 (1995) (arguing that the PTO should be given more deference in decisions by the Federal Circuit).

²³⁸ The Federal Circuit has exclusive appellate jurisdiction over cases arising under the patent law, 28 U.S.C. § 1295(a) (2000), as well as appeals directly from the PTO, 35 U.S.C. § 141 (2000).

²³⁹ Factual findings made by the PTO in the course of prosecution will be reviewed under a "substantial evidence" standard by the Federal Circuit on direct appeal. *In re Gartside*, 203 F.3d 1305, 1313 (Fed. Cir. 2000). Any deference to the PTO during other challenges to its decision making (via litigation) is likely encompassed in the presumption of validity that attaches to each issued patent, thus requiring "clear and convincing" evidence to prove invalidity.

²⁴⁰ Lemley, *supra* note 99, at 1497.

²⁴¹ In as good a position as anyone at the time, though perhaps not in as good a position as the patentee might be later in time. *See, e.g., Kieff, supra* note 10, at 715 (noting that parties are likely to become better informed as time passes regarding the value of any particular patent).

prosecution history estoppel). Without a robust conception of prosecution history estoppel, the consequences of PTO rejections are reduced; a patentee might amend a claim and yet recover the appropriate scope via the doctrine of equivalents.²⁴²

Another possible reason to believe that enhancing the importance of PTO decision making is valuable is that the PTO examiners have a relative advantage over the federal courts in the technical qualifications to make the sorts of detailed factual determinations about validity that are required. That is, the PTO possesses unique technological capabilities that the courts simply cannot match, yet the courts are endowed with the legal authority to determine the validity standards. Accordingly, the best system-wide solution may be to maintain the courts in their roles as interpreters of legal standards to be used by the PTO and to maximize the use of the PTO's specific technological resources to evaluate inventions against those standards. This is achieved by channeling review of PTO decision making to direct appeals, rather than indirect review of validity during enforcement actions.²⁴³

As this Part has demonstrated, a robust conception of prosecution history estoppel produces socially beneficial incentives that effectively tailor parties' behavior within the patent administration system—whether as information-forcing default penalty rules, ways of reducing the prosecution eternity, or as a tool to discipline the institutional arrangements of the U.S. patent administration system. Even though the existence—and value—of such a role has been largely ignored in the literature, there remains an extant question (that has been de-

²⁴² See, e.g., *Hughes Aircraft Co. v. United States*, 140 F.3d 1470, 1477 (Fed. Cir. 1998) (noting, under the pre-*Festo VI* rules of prosecution history estoppel, that the patentee was estopped only against the subject matter disclosed in the prior art cited against it.)

²⁴³ This argument is perhaps more directly in contradistinction to Lemley's cost-related arguments. See Lemley, *supra* note 99, at 1501 (discussing a study of the costs and benefits of the PTO's additional screening). Here, I note that any complete discussion of relative cost must include the costs of erroneous decisions to deny patentability (and their subsequent impact on the system as a whole). See generally Richard A. Epstein, *A Clear View of the Cathedral: The Dominance of Property Rules*, 106 YALE L.J. 2091, 2097 (1997) (noting the importance of *clear* rights in property to stimulate investment—both in property and in areas unpropertized); Kieff, *supra* note 10, at 720-21 (“[W]e typically look to clear and enforceable boundaries in property rights to provide incentives for investment while at the same time giving clearance to non-infringing activities.”). Once the cost of variance is factored in, Lemley's question regarding whether it is more efficient for decision making to occur in the PTO versus litigation becomes closer, as the cost of variance will be far less in the more technologically adept PTO (assuming the production of relevant information, of course).

bated at length in the literature and, especially, the jurisprudence) regarding the value of a strong form of prosecution history estoppel as compared to less rigid alternatives. As I suggest in the following Part, the selection of the strong form of estoppel has substantial relative benefits.

IV. CHOOSING ESTOPPEL: CLARIFYING THE DEBATE ABOUT FORM

This Article has demonstrated that the conventional wisdom about prosecution history estoppel is incomplete, and that prosecution history estoppel serves important roles in the patent administration system as both an information-producing and incentive-creating rule. This more comprehensive theory of prosecution history estoppel can be applied to the recent debates over what form of estoppel rule (that is, the scope-affect when the doctrine is triggered) comports best with the goals of the patent system. Reconsidering estoppel as information-producing and incentive-creating leads directly to the conclusion that a strong form of estoppel—a rule that significantly, clearly, and predictably affects patent scope when triggered²⁴⁴—is the dominant option. The application of the strong form of prosecution history estoppel would result in the elimination of access to the doctrine of equivalents as to the amended/clarified claim language.²⁴⁵

The primary alternative to the strong form of estoppel is what the Federal Circuit in *Festo VI* called the “flexible bar.” Under a flexible bar scheme, the scope of the estoppel (that is, the scope-affect) would vary substantially depending on the particular circumstances. As such, the flexible bar rule leads to several “sub-rules” that set out how to evaluate which circumstances call for what kind of scope-affect. In the pre-*Festo* Federal Circuit doctrine, the analysis considered what one of ordinary skill in the art would have concluded from the prosecution history;²⁴⁶ accordingly, depending upon the particular facts of the

²⁴⁴ Thus the rule (though not the reasoning), *see supra* note 6 (discussing the majority’s reasoning), established by the majority of the en banc Federal Circuit in *Festo VI* is correct. *See Festo VI*, 234 F.3d 558, 571-74 (Fed. Cir. 2000) (en banc) (discussing the forms of the rule).

²⁴⁵ *See Festo VI*, 234 F.3d at 574-75 (describing the complete bar rule). Note that in the *Festo VI* decision, the court discussed only the application of prosecution history estoppel to claim amendments (as opposed to other information, such as arguments); thus the discussion that follows is necessarily focused on claim amendments. However, the argument for the strong form here would apply to all prosecution history information, whether gleaned from express claim amendments or not.

²⁴⁶ *E.g.*, *Litton Sys., Inc. v. Honeywell, Inc.*, 140 F.3d 1449, 1462 (Fed. Cir. 1998) (“[T]he standard for determining whether subject matter has been relinquished is

case, the effect of estoppel could be “from great to small to zero.”²⁴⁷ Another example of the flexible form of estoppel is the “foreseeable bar” rule proposed by Conigliaro, Greenberg, and Lemley.²⁴⁸ Under the foreseeable bar rule, the limiting effect of the rule would be that which was foreseeable to a reasonable patentee at the time of the claim amendment.²⁴⁹ A third (and potentially most significant) appli-

whether one of ordinary skill in the art would objectively conclude from the prosecution history that an applicant surrendered it.” (citing *Mark I Mktg. Corp. v. R.R. Donnelley & Sons Co.*, 66 F.3d 285, 291 (Fed. Cir. 1995)).

Note that the entire analysis of prosecution history estoppel has long been understood to be an issue for the court to decide, despite its clearly factual nature. *See Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 39 n.8 (1997) (noting that prosecution history estoppel is a question of law).

²⁴⁷ *Hughes Aircraft Co. v. United States*, 717 F.2d 1351, 1363 (Fed. Cir. 1983); *see, e.g., Litton*, 140 F.3d at 1456 (taking a limited view of the surrendered subject matter); *Modine Mfg. Co. v. United States Int’l Trade Comm’n*, 75 F.3d 1545, 1555-56 (Fed. Cir. 1996) (taking a more liberal view); 5A CHISUM, *supra* note 23, § 18.05[3][b][ii] (collecting cases).

²⁴⁸ Conigliaro et al., *supra* note 8, at 1048. Note that this test is different from the “foreseeability” factor discussed by the Court in *Festo VII*. *See infra* note 253 (contrasting the Conigliaro, Greenberg, and Lemley “foreseeability” test with that of the Supreme Court in *Festo VII*); *see also* Darius C. Gambino & Richard A. Paikoff, *A New Weapon for Alleged Infringers?: “Patent Drafter Estoppel” Explored*, 10 FED. CIR. B.J. 469 (2001) (discussing foreseeability as a principle in the patent law); Andrew C. Greenberg & Jeffery R. Kuester, *The “Palsgrafting” of Patent Law: Foreseeability and the Doctrine of Equivalents*, INTELL. PROP. TODAY, June 1998, at 17 (same).

²⁴⁹ *See* Conigliaro et al., *supra* note 8, at 1048 (discussing the “foreseeable bar” as a mid-ground between “flexible” and “absolute” bars). Thus, the proposed “foreseeable bar” rule responds to the argument made by Judge Rader in his dissent in *Festo VI*: that the “complete bar rule” would inappropriately limit coverage of later-developed (i.e., unforeseeable) technology, which he believes is the animating force behind the doctrine of equivalents. *Festo VI*, 234 F.3d at 619-20 (Rader, J., dissenting); *see also* Conigliaro et al., *supra* note 8, at 1070 & n.90 (citing Judge Rader’s dissent to support criticism of the absolute bar).

It is not at all clear, however, how this foreseeable bar is any different in effect from the Federal Circuit’s pre-*Festo* “flexible bar.” In the paradigmatic claim amendment case, the flexible bar requires analysis of what subject matter one of ordinary skill in the art would have considered to have been “surrendered” by an amendment. *See supra* notes 246-47 (introducing the standard). This proposed “foreseeable bar” evaluates whether a “reasonable patentee” (i.e., one of ordinary skill in the art) would have foreseen a particular limiting effect of a claim amendment. *See* Conigliaro et al., *supra* note 8, at 1048 (discussing the foreseeable bar). But what one of ordinary skill in the art would have considered to have been surrendered is the *same* as what one of ordinary skill in the art would have foreseen as the limiting effect of the amendment. That is, there is no meaningful analytic distinction between evaluating whether the *same person* (one of ordinary skill in the art) would have: (a) understood subject matter X to have been surrendered; and (b) foreseen that the amendment would limit coverage of (or, “surrender”) subject matter X. In both cases, the analysis devolves to a complex, multifaceted evaluation of the understanding of one of skill in the art, the particularities of the amendment, and the subject matter involved. *See, e.g., id.* at 1060-61 (criti-

cation of the flexible bar is the Supreme Court's "presumptive bar" rule established in *Festo VII*.²⁵⁰ Under this scheme, the application of prosecution history estoppel will presumptively eliminate access to equivalents.²⁵¹ This presumption does not apply, however, "where the amendment cannot reasonably be viewed as surrendering a particular equivalent."²⁵² The Court posits examples of the unreasonable limitation of equivalents:

(a) whether the equivalent was "unforeseeable at the time of the application";²⁵³

cizing the complexity and uncertainty in the Federal Circuit's flexible bar scheme).

Conigliaro, Greenberg, and Lemley argue that the foreseeable bar is distinct from the flexible bar because its test is "more predictable." *Id.* at 1071. And yet the argument fails to convince. They acknowledge their foreseeability test is uniquely "fact specific," *id.* at 1072, and do not identify any specific factor in the traditional flexible bar analysis that would not be present, *cf. id.* at 1072-73 (criticizing the factors involved in the Federal Circuit's version of the flexible bar).

Even assuming that the proposed foreseeable bar and the pre-*Festo* status quo are different, there is good reason to believe that a foreseeable bar in the form suggested by Conigliaro, Greenberg, and Lemley might be considerably *less* useful than even the Federal Circuit's flexible bar approach. That is because the introduction of an explicit "foreseeable" factor renders the analysis circular. That is, whether one of ordinary skill would "foresee" the limiting effect of a claim amendment involves both factual and legal components. For example, in a regime where one of ordinary skill in the art understands the "rules of the game" with respect to prosecution, any foreseeability analysis will thus be subject to then-existing legal construct. A claim amendment made in the backdrop of rules imposing little effect from prosecution history estoppel is going to have a very different foreseeable effect than one made under stronger forms of the rules. Thus, the foreseeability effect of a claim amendment is quite unlike the tort doctrine of "foreseeability" where the analysis involves purely factual scenarios. *E.g.*, *Palsgraf v. Long Island R.R.*, 162 N.E. 99, 103 (N.Y. 1928) (noting that "proximate cause" in the tort sense depends "in each case upon many considerations"); ROBERT COOTER & THOMAS ULEN, *LAW AND ECONOMICS* 367-69 (1st ed. 1988) (discussing the efficiency of the *Palsgraf* rule in torts); A. MITCHELL POLINSKY, *AN INTRODUCTION TO LAW AND ECONOMICS* 39-51 (2d ed. 1989) (same). In the prosecution history estoppel context, foreseeability is constructed, and thus self-references are especially problematic.

²⁵⁰ 122 S. Ct. 1831, 1842 (2002).

²⁵¹ *See id.* at 1842. ("[W]e hold here that the patentee should bear the burden of showing that the amendment does not surrender the particular equivalent in question.").

²⁵² *Id.*

²⁵³ *Id.* The specification that the time of the application (rather than the time of the amendment) is the key date is significant, and seems to undermine the Court's defense of the presumptive bar. First, note that these two dates—the date of application and the date of the claim amendment—could potentially be years apart (especially given the common use of continuation practice before the PTO). Thus there will potentially be a large "gap" in foreseeability, especially in rapidly developing technologies. Yet irrespective of when the amendment is entered, or the rate of technological progress post-application (what if a major breakthrough in the field occurs between

(b) where the rationale underlying the amendment bears no more than a “tangential relation to the equivalent in question”;²⁵⁴ and

(c) “some other reason suggesting that the patentee could not reasonably be expected to have described the insubstantial substitute in question.”²⁵⁵

A close examination of the Court’s presumptive bar reveals that it, like the foreseeable bar, is little different from the pre-*Festo* Federal Circuit doctrine. First, the “presumption” appears to be largely content-free: in a deeply troubling omen for the consistent and predictable application of this new rule, the Court did not address what quantum of evidence might rebut the presumption.²⁵⁶ Might inferences coupled with attorney argument be sufficient? Or boilerplate language placed in the file by the patentee—to the effect that no equivalents were expected to be surrendered?²⁵⁷ One can expect that whether the patentee has overcome the “presumption” will largely

application and amendment?), the patentee can avoid estoppel on the basis of (and thus assert infringement by equivalents against) subject matter not “foreseeable” at the earlier time of the patent application. This would seem to undermine the Court’s argument that its rule properly accounts for the understanding of the patentee during prosecution. *See id.* (“[C]ourts may presume the amended text was composed with awareness of this rule and that the territory surrendered is not an equivalent to the territory claimed.”). Further, the rule would seem to encourage delaying tactics during prosecution—to increase the “foreseeability” advantage noted above.

Note also that this “foreseeability” test is somewhat different from that advocated by Conigliaro, Greenberg, and Lemley. *See Conigliaro et al., supra* note 8, at 1069 (“Under our proposed foreseeable bar, a court will apply the doctrine of equivalents notwithstanding a claim amendment unless the limiting effect of the amended language with respect to an accused device would have been foreseeable at the time of the amendment to a reasonable person skilled in the art.”). The Conigliaro, Greenberg, and Lemley test analyzes the foreseeable *effects* of a particular amendment, while the Supreme Court’s test analyzes whether the asserted equivalent *itself* was foreseeable. *Festo VII*, 122 S. Ct. at 1842. The former implicates a combined legal and factual analysis, while the latter is a question of technology.

²⁵⁴ *Festo VII*, 122 S. Ct. at 1842. This example is targeted to what might be called the “multidimensional surrender” problem for prosecution history estoppel. That is, if a patentee originally claims “stainless steel screws,” and later amends to claim “stainless steel nails” (to avoid covering stainless steel screws), a question might arise regarding whether the patentee had surrendered, for example, bronze nails or bronze screws. That is, in these cases it seems apparent that the patentee intended to amend (and thus “surrender”) along one dimension—here, fastener type. But has the patentee also surrendered along a second dimension—the type of material? Even as this very simple example demonstrates, however, applying this particular example to real cases is likely to be a significant challenge.

²⁵⁵ *Id.*

²⁵⁶ *Id.* (discussing factors that can rebut presumption of estoppel).

²⁵⁷ Of course, this ambiguity offers the Federal Circuit a degree of flexibility to tailor the rule appropriately. *See infra* Part V (discussing post-*Festo VII* strategies).

depend upon the detailed factual circumstances surrounding the amendment—i.e., virtually the same mode of analysis as pre-*Festo*.²⁵⁸ Second, and even more tellingly, there is the Court's third example of an unreasonable limitation of equivalents: "any other reason" the patentee might not have been reasonably expected to describe the equivalent in question. This is, of course, an invitation to parties (and courts) to "fill in the blanks" concerning the case-by-case propriety of limiting equivalents, thus clarifying that the Court's rule is (absent the dubious burden-shift) little different from the Federal Circuit's pre-*Festo* flexible bar rules.²⁵⁹

Thus, a review of the alternatives to the strong form of estoppel demonstrates that each is fundamentally based on the wide-ranging, deeply contextual, analysis of the flexible bar. And, as described below, under the theory of prosecution history estoppel outlined in this Article, there are several reasons that the strong form of prosecution history estoppel is the better choice.

A. *Answering the Call: Prosecution History Estoppel and Patent Reform*

The patent administration system is presently being strongly (and generally deservedly) criticized, in particular for the perceived inability of the PTO to properly evaluate patent applications.²⁶⁰ The complaints are especially sharp in the context of new technologies, such as computer software, business models or financial transactions, or biotechnology.²⁶¹ Such criticisms have resulted in a number of proposals for reform, including a "moratorium" on patenting in certain technologies;²⁶² the imposition of compulsory licenses;²⁶³ an affirmative re-

²⁵⁸ See *supra* notes 78, 246 and accompanying text (discussing the Federal Circuit's pre-*Festo* analysis).

²⁵⁹ *Id.*

²⁶⁰ For a sample of such criticism, see sources cited *supra* note 5.

²⁶¹ See, e.g., LESSIG, *supra* note 5, at 213 & n.111 (criticizing the expense of PTO mistakes); Julie E. Cohen & Mark A. Lemley, *Patent Scope and Innovation in the Software Industry*, 89 CAL. L. REV. 1, 42-45 (2001) ("[S]ignificant deficits in the PTO's ability to examine software patent applications remain unaddressed."); Merges, *supra* note 5, at 578-79 (criticizing patent administration involved with software and business methods).

²⁶² See LESSIG, *supra* note 5, at 259 (proposing a moratorium on patents in software and business models)

²⁶³ See, e.g., *id.* at 260 (suggesting the imposition of compulsory licenses); John H. Barton, *Reforming the Patent System*, 287 SCI. 1933 (2001) (same); Michael A. Heller & Rebecca S. Eisenberg, *Can Patents Deter Innovation? The Anticommons in Biomedical Research*, 280 SCI. 698 (1998) (discussing the problems inherent in the privatization of biomedical research).

quirement that patentees disclose all prior art they know or should have known;²⁶⁴ the presumptive denial of patentability of certain “suspect” inventions;²⁶⁵ and major reforms of the operations of the PTO itself.²⁶⁶

Many of these reform proposals come at significant costs: they would radically alter the ability of inventors to seek patent protection;²⁶⁷ significantly change the basic incentives underlying the patent system;²⁶⁸ or impose significant costs on the public treasury.²⁶⁹ And yet the common intuition centers around the inadequacy of information: the idea that the PTO and the public are inadequately informed about these innovations, their context, and their scope. Thus, the proposals to limit patentability reflect a deep distrust of the information-production process. For example, the proposals to offer compulsory licenses are merely a “back-end” way of addressing errors in evaluation—and thus the failures of information production. Other proposals seek to produce information more directly.

Once we recognize that much of the criticism (and recommendations) aimed at the present patent administration system is related to inadequacy of information, then the strong form of prosecution history estoppel emerges as a crucially important tool of patent reform. By operating as both an important *source* of information, and as a powerful incentive to *produce* further information, a strong regime of

²⁶⁴ See, e.g., LESSIG, *supra* note 5, at 260-61 (suggesting such a requirement).

²⁶⁵ See, e.g., Patent Improvement Act of 2001, H.R. 1333, 107th Cong. § 3 (2001).

²⁶⁶ See, e.g., Lemley, *supra* note 99, at 1496 n.3 (discussing the costs of the PTO's additional screening); Merges, *supra* note 5, at 577 (describing problems with PTO operations).

²⁶⁷ The moratorium and presumptive denial proposals would diminish access to the patent system for innovators in certain fields (in the specific cases cited above, the fields of software and business models). Such a complete bar of access would obviously harm the ability of researchers in these areas to marshal resources to invest in continued innovation and commercialization. See, e.g., Kieff, *supra* note 10, at 703-04 (discussing the need for patents for commercialization).

²⁶⁸ Imposing a series of compulsory licenses would transform the patent system into a liability regime, rather than a property regime. Cf. Guido Calabresi & A. Douglas Melamed, *Property Rules, Liability Rules, and Inalienability: One View of the Cathedral*, 85 HARV. L. REV. 1089, 1092 (1972) (noting differences between property and liability rules). However, Merges and Kieff have convincingly argued that the inability of relatively uninformed third parties such as courts to appropriately evaluate the costs and benefits of commercialization in innovation strongly suggests that patents should remain as “property-like” as possible. See, e.g., Kieff, *supra* note 10, at 733; Merges, *supra* note 12, at 2664.

²⁶⁹ Reforming the PTO is a good idea, but is likely to be quite expensive. As noted above, Lemley has questioned whether the costs of a thorough reform of the patent system are justified. Lemley, *supra* note 99, at 1497.

prosecution history estoppel will expand the production of information.²⁷⁰ And yet such a rule will not have the significant costs attached to it that other reform proposals feature: access to the patent system will not be curtailed, patentee's bargaining rights need not be reduced²⁷¹ and no additional resources need to be expended by the public. Because the strong form of prosecution history estoppel forces patentees to internalize (or at least to consider) the costs of underproduction of information, the rule supports a key criterion of the function of patents as property rights: the view that private parties with full information are best able to evaluate respective costs and benefits.²⁷² Thus, the imposition of a strong form of prosecution history estoppel is strongly justified on the basis of patent reform since the additional production of information will address many of the contemporary concerns about the patent administration system.²⁷³

One final point is in order here. As should be obvious, even a weaker version of prosecution history estoppel—such as the Federal Circuit's pre-*Festo* status quo²⁷⁴—provides at least some incentives to produce information; however, maintaining the status quo is not “reform.” In this Part, I am assuming that at least some of the criticisms (i.e., those related to the incompleteness of information) are valid, and am offering the strong form of prosecution history estoppel as a potentially significant tool that will yield changes in the system.

B. *Clarifying the Borders of Estoppel: Rules Versus Standards*

A second major reason to favor a strong form of prosecution history estoppel is that it creates a rule rather than a standard.²⁷⁵ This is

²⁷⁰ See *supra* Parts II-III (noting the roles of prosecution history estoppel). As noted above, *supra* text accompanying note 231, it is correct that strong forms of prosecution history estoppel will lead to less amendment (and thus information expressed by amendment). Yet the incentives will also produce more information before prosecution, and are likely to engender more argument between the prospective patentee and the PTO.

²⁷¹ The scope of the patent grant may be reduced, of course, as a result of the prosecution history. *Supra* notes 76-87 and accompanying text.

²⁷² See, e.g., *supra* note 268 (discussing property rules versus liability rules).

²⁷³ Professor Kesan has suggested a number of additions and alterations to the patent system directed at producing information for much the same reasons. Jay P. Kesan, *Carrots and Sticks to Create a Better Patent System*, 17 BERKELEY TECH. L.J. 763 (2002).

²⁷⁴ See, e.g., *Litton Sys., Inc. v. Honeywell, Inc.*, 140 F.3d 1449, 1456 (Fed. Cir. 1998) (stating the pre-*Festo VI* rule). The “foreseeable bar” suggested by Conigliaro, Greenberg, and Lemley would fit within this category as well. Conigliaro et al., *supra* note 8, at 1045-49.

²⁷⁵ I refer here to the distinction between regulation via rules and regulation via

not merely to suggest that a rule form will provide more notice to the public relating to the scope of any particular patent—although that is certainly true²⁷⁶—but that the imposition of the rule-like strong form of prosecution history estoppel will in itself be a better choice. I note two considerations in this vein.

First, the imposition of a rule will greatly increase the incentives that all parties have to learn and respond to the law. Specifically, a strong form of prosecution history estoppel will result in rapid adjustment to the new rule, thus leading much more quickly and certainly to the benefits of prosecution history estoppel²⁷⁷ than would a weaker form of the rule.²⁷⁸

standards: “If we want to prevent driving at excessive speeds, one approach is to post specific speed limits and to declare it unlawful per se to exceed those limits; another is to eschew specific speed limits and simply declare that driving at unreasonable speeds is unlawful.” Isaac Ehrlich & Richard A. Posner, *An Economic Analysis of Legal Rulemaking*, 3 J. LEGAL STUD. 257, 257 (1974). In the prosecution history estoppel context, the strong form has rule-like characteristics, while the weaker/flexible forms are standards.

The ongoing debate about the relative merits of “rules versus standards” has generated a substantial literature. See, e.g., MARK KELMAN, A GUIDE TO CRITICAL LEGAL STUDIES 15-63 (1987) (outlining and critiquing the rules versus standards debate); Ian Ayres, *Preliminary Thoughts On Optimal Tailoring Of Contractual Rules*, 3 S. CAL. INTERDIS. L.J. 1 (1993) (describing the choice between rules and standards in the context of contracts); Colin S. Diver, *The Optimal Precision of Administrative Rules*, 93 YALE L.J. 65 (1983) (discussing rules versus standards in the administrative law context); Louis Kaplow, *Rules Versus Standards: An Economic Analysis*, 42 DUKE L.J. 557 (1992) (providing an economic analysis of the choice between rules and standards); Duncan Kennedy, *Form and Substance in Private Law Adjudication*, 89 HARV. L. REV. 1685, 1687-1713 (1976) (considering the “choice between rules and standards as the form for legal directives”); Margaret Jane Radin, *Reconsidering the Rule of Law*, 69 B.U. L. REV. 781, 783-91 (1989) (distinguishing between the instrumental and substantive conceptions of the rule of law); Carol M. Rose, *Crystals and Mud in Property Law*, 40 STAN. L. REV. 577, 592-93 (1988) (describing the differences between rules and standards); Pierre Schlag, *Rules and Standards*, 33 UCLA L. REV. 379 (1985) (explaining the dispute over rules versus standards); Kathleen M. Sullivan, *The Supreme Court, 1991 Term-Foreword: The Justices of Rules and Standards*, 106 HARV. L. REV. 22 (1992) (discussing the split within the Supreme Court over the choice between adopting rules or standards in constitutional law).

²⁷⁶ See, e.g., *Festo VI*, 234 F.3d 558, 574-78 (Fed. Cir. 2000) (en banc) (explaining the notice function of the strong prosecution history estoppel rule); see also Kaplow, *supra* note 275, at 621 (arguing that rules should govern more frequent conduct, as the costs of rules in this context is likely to be less than the costs of standards because the outcome of any question is more predictable).

²⁷⁷ See *supra* notes 217-18 and accompanying text (describing the effects of a prosecution history estoppel rule).

²⁷⁸ See, e.g., Ayres, *supra* note 275, at 7-8 (commenting on the relative costs to individuals of rules versus standards); Randy E. Barnett, *The Sound of Silence: Default Rules and Contractual Consent*, 78 VA. L. REV. 821, 887-92 (1992) (describing how, under conditions of uncertainty and high costs of learning, parties will remain “rationally igno-

Second, not only will the imposition of a rule for prosecution history estoppel greatly increase the means by which the public can ascertain the scope of estoppel,²⁷⁹ it will also (and equally importantly) substantially increase the confidence with which the concerned patentee can evaluate (and perhaps avoid) the penalty default costs of prosecution history estoppel. That is, the clear rule of the strong form of estoppel assists patentees in both determining the costs of modifying their behavior and realizing that such modifications will avoid the costs of estoppel. By contrast, the weaker forms of estoppel provide at best hints and conjectures—and more likely are *ex ante* indeterminate²⁸⁰—as to the consequences of any particular claim amendment or clarification. In such cases, the choice of a clear rule will dominate that of a complex standard.²⁸¹

There are, of course, costs associated with rules, and a strong form of prosecution history estoppel is no exception. One obvious cost is the distributional unfairness that the change to a strong form would work on current patentees, who prosecuted their patents with at least somewhat different expectations. As noted above, however, these costs, while perhaps significant on an individual basis, are not likely to be meaningful in the context of the patent system more generally.²⁸² Another (and potentially more important) cost is the potential diminishment in incentives to patent as a result of the additional costs incurred by patentees by a strong form of prosecution history estoppel. These costs might take the form of the additional costs of developing

rant”); Kaplow, *supra* note 275, at 621 (noting the importance—and costs—of parties learning the law).

²⁷⁹ This point is, of course, obvious, and is the primary ground upon which the Federal Circuit justified the change to the strong form of estoppel. *Festo VI*, 234 F.3d at 577-78.

²⁸⁰ Neither the “flexible bar” rule nor the proposed “foreseeable bar” are *ex ante* predictable—in part because each analysis requires determination of the particular views of a hypothetical person of ordinary skill in the art, a construct that will necessarily remain undefined until the Federal Circuit rules on the matter. *But see* Conigliaro et al., *supra* note 8, at 1072 (arguing that the foreseeable bar is *ex ante* predictable because of the objective nature of the inquiry).

²⁸¹ Here, a predictable response might be that the standard (i.e., the flexible forms of the prosecution history estoppel rule) will also lead patentees to the behavior—additional disclosure—that is the benefit of the strong form of estoppel. *See supra* note 270 and accompanying text (describing the benefits of a prosecution history estoppel rule). In this case, however, the choice is even more clear: the compliance and learning costs of the flexible form will swamp that of the strong form. In other words, if the flexible form eventually yields patentees in the same position as the strong form, then we might as well have the clearer, simpler, and cheaper rule.

²⁸² *See supra* notes 99-102 and accompanying text (estimating that .03 percent of patents would be affected).

pre-prosecution information, hiring skillful patent drafters, adopting more vigorous prosecution strategies, etc. This argument is valid—a strong form of prosecution history estoppel will increase costs to patentees, and on the margin decrease the incentives produced by the patent system. The question then, is whether this cost is justified by the benefits that flow from the rule rather than the standard. As noted at length above, the patentee is generally going to be the lowest-cost producer of information concerning the context of his or her own invention.²⁸³ Further, to the extent that the patentee-produced information is both more timely and more accurate than otherwise, substantial benefits will accrue to the public because of better operation of the patent administration system.²⁸⁴ While this claim is obviously contingent and subject to empirical testing, it seems clear that the social harm from any marginal decrease in incentives as a result of additional costs will be more than offset by the benefits flowing from the strong form of estoppel.²⁸⁵

C. *Evidence of Failure: The Origins of Festo*

A third—and yet perhaps no less important—reason to favor the strong form of estoppel over the weaker forms is that the only significant evidence concerning the application of the weaker forms of prosecution history estoppel points towards failure. In its *Festo VI* de-

²⁸³ See *supra* note 160 and accompanying text (noting that the patentee has access to most of the information).

²⁸⁴ See *supra* notes 161-62 and accompanying text (describing the benefits of patentee-provided information).

²⁸⁵ It might also be argued that the use of a rule here—that is, the strong form of estoppel—will impose costs in cases where a prospective patentee is unable to foresee the significance of the scope-reduction that results from an amendment. Yet even where the patentee cannot anticipate the progress of technology (and thus cannot accurately determine the “cost” of scope-reduction *ex ante*), the nature of the effect—the loss of scope, both of foreseeable and unforeseeable subject matter—is eminently understandable, albeit not amenable to precise valuation. (In the patent context, of course, precise *ex ante* valuations are unlikely in any event.) Therefore, the objection related to “unforeseen” equivalents being excluded under a strong form of the rule is no different than the objection to excluding foreseeable equivalents. While discussing the fairness of their proposed foreseeable bar, Conigliaro, Greenberg, and Lemley emphasize the importance of applying the doctrine of equivalents:

[W]here the limiting effect of an amendment’s language with respect to an accused device could not have been objectively foreseen at the time of the amendment[,] . . . refusing to apply the doctrine of equivalents unfairly deprives the patentee of protection that the Supreme Court has repeatedly deemed essential to a meaningful right of exclusivity under the patent system.

Conigliaro et al., *supra* note 8, at 1069.

cision, the seven-member majority of the Federal Circuit noted that the court's "nearly twenty years" of experience with the flexible bar rule had convinced it that change was necessary.²⁸⁶ Describing the flexible bar rule as "virtually unascertainable,"²⁸⁷ the court noted that its experience had convinced it that it was "impossible . . . for the public or the patentee" to determine the scope of prosecution history estoppel.²⁸⁸ Thus, the court turned to the strong form of the rule—what it called the "complete bar"—as an alternative.

The rejection of the flexible bar rule by the Federal Circuit is, I suggest, significant for its own sake. First, there is no institution in a better position to evaluate the success or failure of the prosecution history estoppel rule than the Federal Circuit, which has the ultimate responsibility for applying the rule.²⁸⁹ When evaluating whether a particular doctrinal rule is likely to function effectively, the views of the judges charged with implementing it must be given significant weight.²⁹⁰

A second reason to take the Federal Circuit's empirical conclusion here quite seriously is that it moves against two linked trends in the patent law (both of which are the product of the Federal Circuit itself): (a) a shift in the locus of decision making from juries to judges;²⁹¹ and (b) the increasing importance of Federal Circuit decision making.²⁹² In contrast, the declaration that the flexible bar rule

²⁸⁶ *Festo VI*, 234 F.3d 558, 574-75 (Fed. Cir. 2000) (en banc) ("Our decision to reject the flexible bar approach . . . comes after nearly twenty years of experience in performing our role as the sole court of appeals for patent matters.").

²⁸⁷ *Id.* at 577.

²⁸⁸ *Id.*

²⁸⁹ Prosecution history estoppel, and its application, is considered a matter of law. *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 39 n.8 (1997).

²⁹⁰ Some have suggested, however, that such considerations should be given little weight, as the Federal Circuit is itself anti-patent. *See, e.g., Ayers, supra* note 75, at 549 (arguing that the Federal Circuit's decision in *Festo* is the culmination of a history of anti-patent bias). Recent studies have not borne this out. *See, e.g., Allison & Lemley, supra* note 100, at 240-44 (finding no bias on the part of individual judges); Donald A. Dunner, *A Statistical Look at the Federal Circuit's Patent Decisions: 1982-1994*, 5 FED. CIR. B.J. 151 (1995) (finding that the Federal Circuit is not biased in favor of or against patents).

²⁹¹ The paradigmatic example of this is claim construction. *See Markman v. Westview Instruments, Inc.*, 517 U.S. 370 (1996) (holding that claim construction is an issue reserved exclusively for the court). In *Warner-Jenkinson*, the Supreme Court appeared affirmatively to exhort the Federal Circuit to remove patent cases from juries. 520 U.S. at 39 n.8.

²⁹² The importance of Federal Circuit decision making is a factor of both (a) the increasing significance of legal determinations in patent cases, thus resulting in greater reviewability of appellate judgments, *see, e.g., Cybor Corp. v. Fas Techs., Inc.*, 138 F.3d

was “unworkable”—and replacing it with the crystal-clear “complete bar” rule—was tantamount to the Federal Circuit announcing that it was getting out of the business of deciding the scope of prosecution history estoppel.²⁹³ Given the recent history of this court, the move away from unfettered judicial determinations (and thus unfettered Federal Circuit determinations) is a remarkable step that suggests that the court was quite serious about the problems with the flexible bar status quo.

When the doctrine of prosecution history estoppel is considered in the context of its dual roles in the patent administration system—providing information and creating incentives—the importance of the strong form of the rule is clear. As a tool for patent reform—a rule instead of a standard, and supported by the experience of a majority of the Federal Circuit—the strong form of prosecution history estoppel dominates the weaker, more flexible forms. And yet the Supreme Court’s *Festo VII* decision reimposed a widely flexible standard for the application of prosecution history estoppel.²⁹⁴ Accordingly, the following Part concludes the Article with a brief look ahead, evaluating the range of options for addressing the failure of the *Festo* decisions to recognize the importance of prosecution history estoppel.

1448 (Fed. Cir. 1998) (holding that claim construction is an entirely legal issue and no deference is to be given to district courts), and (b) the Federal Circuit’s fondness for complex “totality of the circumstances”-type tests, which lend little guidance to the district courts (and thus devalue their decision making), *see, e.g.*, *Litton Sys. v Honeywell Inc.*, 140 F.3d 1449 (Fed. Cir. 1998) (outlining the pre-*Festo VI* multi-factor test for prosecution history estoppel). *See also* Conigliaro et al., *supra* note 8, at 1072 n.100 (noting the trend “in patent law towards greater decision-making by judges”); William C. Rooklidge & Matthew F. Weil, *Judicial Hyperactivity: The Federal Circuit’s Discomfort with Its Appellate Role*, 15 BERKLEY TECH. L.J. 725 (2000) (identifying the tendency of the Federal Circuit Court of Appeals to expand its traditional role to include fact-finding).

²⁹³ Conigliaro, Greenberg, and Lemley suggest, without elaboration, that the strong form of prosecution history estoppel would shift resolution of patent cases from juries to judges. Conigliaro et al., *supra* note 8, at 1072. But the issue of prosecution history estoppel (and its scope) was always one of law, *Warner-Jenkinson*, 520 U.S. at 39 n.8, so the change in forms would not have any direct impact. Perhaps the reduction in the number of cases involving the doctrine of equivalents would decrease the jury’s role. *But see supra* note 292 (noting small numbers of affected cases). However, it seems as likely that the clarity of the strong form of estoppel would *decrease*, not increase, the importance of judicial decision making: because the parties (and district courts) can easily determine the existence and scope of estoppel, there is correspondingly less room for judicial decision making.

²⁹⁴ *See* 122 S. Ct. 1831, 1841 (2002) (rejecting the absolute bar standard adopted by the Federal Circuit); *see also supra* notes 250-51 and accompanying text (describing the Court’s rule).

V. CONCLUSION: BEYOND *FESTO*

The Supreme Court's opinion in *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.* marked a profoundly disappointing conclusion to a significant jurisprudential endeavor to reform the patent administrative system.²⁹⁵ As noted above, the effort collapsed under the weight of the narrow, wooden, and ultimately incorrect equivalents-centered view of prosecution history estoppel.²⁹⁶ And yet this Article concludes on a hopeful note, offering two observations. The first is that the Federal Circuit, by virtue of the flexibility in the Supreme Court's *Festo VII* rule, has an opportunity to strengthen the form of prosecution history estoppel, thus reaping at least some of the benefits described above.²⁹⁷ The second is that despite the failure of the *Festo* courts to recognize the importance of prosecution history estoppel in creating ex ante effects, the analytic path followed by this Article—a shift from ex post to ex ante analysis—is both generalizable to other aspects of the patent law and likely to be beneficial.

A. *Tweaking the Presumptive Bar: Strategies for the Federal Circuit*

Although the Court in *Festo VII* imposed a weak form of prosecution history estoppel—a version of the flexible bar rule that I have described as the “presumptive bar”—there remains some opportunity for the Federal Circuit to fill the doctrinal gaps in ways that support a theory of prosecution history estoppel that reflects the doctrine's dual roles in information production and incentive creation. Indeed, it is the very flexibility of the *Festo VII* flexible bar rule that provides a range of discretion to that court, and the opportunity to move prosecution history estoppel in the right direction, if not all the way.

Strengthen the Presumption. The first insight from the analysis in this Article is the importance of a strong form of estoppel.²⁹⁸ The possibility of patent scope reduction generates powerful incentives for patentees to act in socially beneficial ways or at least to internalize the costs of their activities to some degree. While the *Festo VII* opinion precludes the direct use of a strong form of estoppel,²⁹⁹ it is ambigu-

²⁹⁵ 122 S. Ct. at 1841.

²⁹⁶ See *supra* Part I (exploring the incompleteness of the current equivalents-centered view of prosecution history estoppel).

²⁹⁷ See *supra* Part IV (noting advantages of the strong form of the rule).

²⁹⁸ See *supra* Parts III-IV (advocating the use of a strong form of estoppel).

²⁹⁹ See *Festo VII*, 122 S. Ct. at 1841 (“[T]here is no more reason for holding the patentee to the literal terms of an amended claim than there is for abolishing the doc-

ous, as noted above, concerning the strength of the presumption that an amendment eliminates access to the doctrine of equivalents.³⁰⁰ A stronger presumption—that is, a more vigorous evidentiary hurdle for the patentee—will result in more cases in which equivalents are barred and thus generate greater ex ante incentives of the beneficial nature described above. Thus, the Federal Circuit should take the opportunity to clarify the strength and scope of the *Festo VII* presumption, and in doing so should strengthen it as much as possible.

Reduce the Loopholes. In noting that the presumptive bar could be overcome if the elimination of equivalents was not “reasonable,” the Supreme Court offered three examples of cases that should be deemed unreasonable.³⁰¹ Of relevance here is the third “catch-all” example: “[S]ome other reason suggesting that the patentee could not reasonably be expected to have described the insubstantial substitute in question.”³⁰² The Federal Circuit should move with dispatch to clarify that the “some other reason” phraseology is quite limited, either by suggesting a limited set of reasons itself or by noting that the addition of reasons to sidestep the presumptive bar requires powerful evidence that doing otherwise would be unreasonable. Doing so would effectively strengthen the form of the estoppel rule, by restricting the cases that would avoid the effect of estoppel.³⁰³

Impose Clarity. Finally, the Federal Circuit should avoid repeating the mistakes of the pre-*Festo* prosecution history estoppel rules, which a majority of the court described as rendering it virtually impossible to ex ante predict the outcome of any given case. As noted in Part IV

trine of equivalents altogether and holding every patentee to the literal terms of the patent.”).

³⁰⁰ See *id.* at 1834 (discussing the presumption that a decision to narrow claims through amendment is a “general disclaimer of the territory between the original claim and the amended claim”).

³⁰¹ *Id.*; see also *supra* notes 253-55 and accompanying text (discussing the examples).

³⁰² *Festo VII*, 122 S. Ct. at 1842.

³⁰³ And failing to do so could result in the dramatic watering-down of the presumption so as to render it meaningless. For example, the Court in *Festo VII* noted the inherent difficulties in language-based descriptions of inventions. See *id.* at 1837 (“[T]he nature of language makes it impossible to capture the essence of a thing in a patent application.”); see also *Autogiro Co. of Am. v. United States*, 384 F.2d 391, 397 (Ct. Cl. 1967) (“Often [an] invention is novel and words do not exist to describe it.”). Under a permissive application of the “some other reason . . . that the patentee could not reasonably be expected to have described the equivalent in question,” *Festo VII*, 122 S. Ct. at 1842, framework, that “the nature of language makes it impossible to capture the essence of a thing in a patent application,” *id.* at 1837, could be viewed as enough to overcome the presumption—thus vitiating the presumption altogether.

above, the implementation of a rule rather than a standard in this context is likely to be beneficial. Further, the court should recall that it was largely the widespread dissatisfaction with the unconstrained and unpredictable forms of analysis allowed under the pre-*Festo* regime that prompted the most recent efforts. Accordingly, the Federal Circuit should take the opportunity to clarify aspects of the *Festo VII* analysis as much as possible, such as the quantum of evidence required to overcome the presumption, what constitutes “some other reason,” and more. To the extent possible, the court should impose on itself analytic guidelines in an attempt to avoid the slide into a “totality of the circumstances” form of analysis.

In view of the three observations noted above, it seems clear that the Federal Circuit has a brief window of opportunity to take important steps beneficially to affect the patent administration system. Although the Supreme Court in *Festo VII* inadequately considered the true significance of prosecution history estoppel, the jurisprudential discretion granted to the Federal Circuit offers a glimmer of hope that at least some reform may yet be realized.

B. *Ex Ante Versus Ex Post: Innovating the Patent Law*

Absent doctrinal developments at the Federal Circuit bordering on judicial disobedience, the *Festo* cases have failed in their role as a vehicle for significant patent reform. Thus, given the circumstances, it seems unlikely that the courts will recognize the inadequacies of the equivalents-centered approach to prosecution history estoppel in favor of the broader theory set forth in this Article anytime soon. And yet the analytic framework here is, I think, significant in its own right and suggests further avenues of scholarly inquiry.

Stepping back, the basic move in the reconsideration of estoppel developed above is the shift in focus from the ex post aspects of the doctrine to the rule’s ex ante effects.³⁰⁴ That is, the equivalents-centered view critiqued above is classically an ex post analysis that is concerned with the appropriate allocation of liability in a world where the basic circumstances have been established, although the precise

³⁰⁴ Professor Bebchuk has recently made important contributions to the understanding of the ex ante/ex post analytic distinction. See Lucian Arye Bebchuk, *Property Rights and Liability Rules: The Ex Ante View of the Cathedral*, 100 MICH. L. REV. 601 (2001) [hereinafter Bebchuk, *Property Rights and Liability Rules*] (describing the importance of ex ante evaluations of entitlements); see also Lucian Arye Bebchuk, *Ex Ante Investments and Ex Post Externalities* (Dec. 2001) (unpublished manuscript) (formalizing the model), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=297091.

boundaries may be somewhat indistinct.³⁰⁵ In the prosecution history estoppel context, the *ex post* view (e.g., the equivalents-centered view) asks whether the patent language in question, given certain amendments or clarifications during prosecution, should nonetheless be extended to capture an allegedly-equivalent accused device.³⁰⁶ By contrast, an *ex ante* theory of prosecution history estoppel analyzes the effects on prosecution (and pre-prosecution) behavior that the allocation of liability will yield.³⁰⁷

The importance of this general insight is twofold. The first is the recognition that the *ex ante* effects of a given decision concerning liability will have efficiency implications; thus, considering only the *ex post* results is analytically incomplete.³⁰⁸ Second, in a world where the determination of liability *ex post* is costly (and/or prone to error), the *ex ante* effects of a legal rule become highly important—either because they in large measure determine the allocation of liability, or because the inefficiencies related to *ex ante* analysis are significant. Here, as noted above, the informational challenges associated with evaluating the patentability and scope of a patent—particularly during litigation—are so pervasive as to command consideration of the incentives surrounding prosecution (and pre-prosecution).³⁰⁹ Thus, the *ex ante*-based theory of prosecution history estoppel developed above is advantageous over that focused on *ex post* allocations of liability.

In the patent context, featuring significant informational challenges and costly *ex post* determinations of liability, a focus on the *ex ante* effects of any particular legal rule seems especially appropriate. Thus, the analytic framework developed in this Article is generalizable across the patent law. This insight suggests that other legal rules in the patent law are likely to be amenable to renewed *ex ante* consideration. Take claim construction,³¹⁰ for example: an *ex ante* approach would evaluate the choice of legal doctrines for claim construction ac-

³⁰⁵ See, e.g., Bebchuk, *Property Rights and Liability Rules*, *supra* note 304, at 602-03 (describing *ex post* analyses).

³⁰⁶ See *supra* Part I (discussing the equivalents-centered analysis).

³⁰⁷ See Bebchuk, *Property Rights and Liability Rules*, *supra* note 304, at 603-04 (describing *ex ante* analyses).

³⁰⁸ See *id.* at 604 (“Different divisions of *ex post* value lead to different *ex ante* actions and investments. As a result, a given rule’s effects on the *ex post* division of the total pie have an important effect on the overall *ex ante* efficiency of the rule.”).

³⁰⁹ See *supra* Parts II-III (addressing the failures of the equivalents-centered view and advocating the adoption of a strong form of prosecution history estoppel).

³¹⁰ “Claim construction” is the determination of the meaning of disputed claim terms.

according to effects on claim drafting. This might suggest that a rule assigning the default meaning of claim terms according to a standard dictionary³¹¹ would be beneficial,³¹² even though the ex post effects might be less clear.³¹³ Other patent doctrines, such as obviousness³¹⁴ or even the doctrine of equivalents,³¹⁵ might be similarly amenable to ex ante-based analyses.

The intuition here, I suggest, is that a systematic reevaluation of patent doctrines according to their ex ante effects is likely to yield new approaches to staid jurisprudential features of the patent law. And given the ever-increasing complexity of the patent system,³¹⁶ the continued rapid growth rate of patent applications, and mounting criticism of patent administration, such an innovation would seem to offer a better “payoff” (in terms of reform) than simply rehashing existing debates concerning the ex post allocation of patent rights. Therefore, by clearly establishing the advantages of ex ante forms of analysis (and the weaknesses of traditional views), the missed opportunity for meaningful reform represented by the *Festo* decisions is perhaps better viewed as only the beginning of reform efforts—rather than the end.

³¹¹ Perhaps the PTO could promulgate an “official” list of standard reference sources, related to technological field where appropriate. Claim terms would then be presumed to take the meaning assigned in the standard source, unless the patentee clearly designated a different meaning.

³¹² Beneficial in the sense that it would induce patentees to be clear about the meanings of the words they choose for the claims.

³¹³ The primary objection would be that dictionary definitions are poor substitutes for more contextual determinations of meaning. *Cf., e.g., Autogiro Co. of Am. v. United States*, 384 F.2d 391, 397 (Ct. Cl. 1967) (“The dictionary does not always keep abreast of the inventor. It cannot. Things are not made for the sake of words, but words for things.”).

³¹⁴ A patent may not be obtained . . . if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.

35 U.S.C. § 103(a) (2000).

³¹⁵ *See, e.g., Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 21 (1997) (describing in detail the doctrine of equivalents).

³¹⁶ *See, e.g., John Allison & Mark Lemley, The Growing Complexity of the U.S. Patent System*, 82 B.U. L. REV. 77 (2001) (evaluating the increasing complexity of the patent law empirically).