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Patent Silences

Dan L. Burk*

A great deal has been said in recent years about patent disclosure. But to say that there is a disclosure function in the patent system implies that there is non-disclosure functioning in the patent system as well. For some information to be disclosed in a patent, other information must go undisclosed; for some things to be included, other things must be excluded. In this article I review the surprising number of doctrines that allow and encourage patent applicants to remain silent about aspects of their inventions. I find that some silences in patents are inadvertent, while some are deliberate; some are necessary, while some are strategic. I conclude that a combination of such explicit and tacit silences allows patents to function as boundary objects, that is, as artifacts that have sufficiently definite meaning to be useful in disparate social worlds, but which simultaneously are sufficiently ambiguous to become objects of collaboration between disparate social worlds. Because innovation is known to occur when localized knowledge is transferred across social boundaries, this function of the patent document is critical to its stated purpose, and occurs largely because of its open rhetorical spaces. Thus, rather than fixating on enhanced disclosure, I argue that much of the critical work of the patent system can and should occur in the open rhetorical spaces where patents are silent.

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Only in silence the word,
only in dark the light,
only in dying life:
bright the hawk's flight
on the empty sky.¹

INTRODUCTION

The theme of this symposium is “the disclosure function of the patent system.” A great deal has been said or written in recent years about patent disclosures, typically about whether they are adequate or inadequate, read or unread, necessary or unnecessary.² Depending on which of these positions is adopted, commentators then generally advance proposals for more disclosure, or better disclosure, or more accessible disclosure. Many of the papers in the symposium advance such arguments or augment previous recommendations along these lines.³

I wish to turn the theme on its head. To say that there is a disclosure function in the patent system necessarily implies that there is non-disclosure functioning in the patent system as well. For some information to be disclosed in a patent, other information must go undisclosed; for some things to be included, other things must be excluded. This holds true as a practical matter; one simply cannot include everything. But it is also true as a strategic and a conceptual and a functional matter. What goes unsaid shapes the patent just as surely as does that which *is* said; as James Boyd White observed, the significance of language “lies in silence, in the unstated but accepted

1. URSULA K. LE GUIN, *A WIZARD OF EARTHSEA* 7 (1968).

2. See, e.g., John R. Allison & Lisa Larrimore Ouellette, *How Courts Adjudicate Patent Definiteness and Disclosure*, 65 DUKE L.J. 609 (2016); Alan Devlin, *The Misunderstood Function of Disclosure in Patent Law*, 23 HARV. J.L. & TECH. 401 (2010) (critiquing disclosure rationales); Jeanne Fromer, *Patent Disclosure*, 94 IOWA L. REV. 539 (2009) (advocating more robust disclosure requirements); Timothy R. Holbrook, *Possession in Patent Law*, 59 SMU L. REV. 123 (2006); Lisa Larrimore Ouellette, *Do Patents Disclose Useful Information?*, 25 HARV. J.L. & TECH. 545 (2012); Jason Rantanen, *Patent Law's Disclosure Requirement*, 45 LOY. U. CHI. L.J. 369 (2013); Jason Rantanen, *Peripheral Disclosure*, 74 U. PITT. L. REV. 1 (2012); Sean Seymore, *The Teaching Function of Patents*, 85 NOTRE DAME L. REV. 621 (2010).

3. See, e.g., Jonas Anderson, *Claiming Disclosure*, 69 VAND. L. REV. 1573 (2016) (arguing that the statutory definiteness standard advances disclosure); Jeanne Fromer, *Dynamic Patent Disclosure*, 69 VAND. L. REV. 1715 (2016) (arguing for post-application supplemental disclosure); Lisa Larrimore Ouellette, *Patent Law's Pierson v. Post Problem*, 69 VAND. L. REV. 1825 (2016) (asserting the importance of disclosure for patent timing).

background against which [words] have their meaning.”⁴ Only by understanding what is not disclosed, and why it is not disclosed, can we get an accurate picture of what *is* disclosed and why.

Yet patent silences remain unexamined. Consequently, in this short Article I offer a first survey of such non-disclosures, tracing the surprising number of doctrines that allow and encourage patent applicants to remain silent about aspects of their inventions. By mapping the silences and interludes in patent disclosure, I hope to see the full contours of the patent as an artifact. Rather than beginning with a particular expectation as to what patent disclosure should look like and what it should accomplish, my method here is to survey the pattern of patent silences to see what characteristics emerge, and then to ask what purposes the discovered contours of the artifact seem suited to fulfill.

Much of my focus here will be on the use of language, on what is properly called rhetoric, not in the pejorative sense of empty or effusive oratory, but rather in the formal sense of an analysis probing the social or epistemological content of discourse.⁵ What goes said and unsaid in the patent document produces a very specific type of discourse, framing the invention, and the rights inhering in the invention, in a very specific way. So this seems the proper set of tools for considering the role of silence; rhetorical analysis accounts for both the spoken and the unspoken. As Marianne Constable explains, rhetoricians “read texts for what they say; and they read texts for what they don’t say. They read the words of a text; they listen for its silences. . . . They read between the lines; they read around the lines.”⁶ From such reading rhetoricians divine the social roles performed by the texts they examine.

From mapping the silences that are permitted, tolerated, and even promoted in the patent document, I conclude that patents are suited to a rather different function than those most often asserted in discussions of patent disclosure. I shall argue that the pattern of patent silences allows patents to function as *boundary objects*. The concept of the boundary object has emerged from sociological research to become ubiquitous across a wide range of disciplines,⁷ but the

4. JAMES BOYD WHITE, *JUSTICE AS TRANSLATION: AN ESSAY IN CULTURAL AND LEGAL CRITICISM* 34 (1994).

5. See Dan L. Burk & Jessica Reyman, *Patents as Genre: A Prospectus*, 26 *LAW & LITERATURE* 163 (2014) (distinguishing colloquial and technical uses of the term “rhetoric”).

6. MARIANNE CONSTABLE, *JUST SILENCES: THE LIMITS AND POSSIBILITIES OF MODERN LAW* 17 (2005).

7. Susan Leigh Star, *This Is Not a Boundary Object: Reflections on the Origin of a Concept*, 35 *SCI. TECH. & HUM. VALUES* 601, 604 (2010).

concept has had surprisingly little purchase in law.⁸ In general, boundary objects may be defined as artifacts that have sufficiently definite meaning to be useful in disparate social worlds, but which simultaneously are sufficiently ambiguous to become objects of collaboration between such disparate social worlds.⁹

Patents certainly exist across disparate social worlds; they clearly have different meanings in different settings, whether in finance, management, research, marketing, or law. I will argue that patents are and should be suited to function as points of contiguity between these social domains. Because innovation is known to occur when localized knowledge is transferred across social boundaries,¹⁰ I conclude that this function of the patent document is critical to its stated purpose and occurs largely because of its open rhetorical spaces. This suggests that, far from focusing on enhanced disclosure, we should recognize that much of the critical work of the patent system can and should occur in the open rhetorical spaces where patents are silent.¹¹

I. RECONSIDERING DISCLOSURE

Numerous scholars have addressed the question of patent disclosure, the proposition that patents are intended to communicate

8. For very rare exceptions, see, for example, Dan L. Burk, *Feminism and Dualism in Intellectual Property Law*, 15 AM. U. J. GENDER SOC. POL'Y & L. 183, 204 (2007), on copyright; Laura A. Foster, *Critical Cultural Translation: A Socio-Legal Framework for Regulatory Orders*, 21 IND. J. GLOBAL LEGAL STUD. 79, 97–100 (2014), on biodiversity; and Gregg P. Macey, *The Architecture of Ignorance*, UTAH L. REV. 1627, 1674–75 (2013), on environmental law. Probably the most extensive exploration of the boundary objects in the legal literature to date is found in Michael Madison's deployment of the concept in a limited role in the copyright context. See Michael J. Madison, *The End of the Work as We Know It*, 19 J. INTELL. PROP. L. 325, 353–56 (2012); Michael J. Madison, *IP Things as Boundary Objects: The Case of the Copyright Work* (U. Pitt. Legal Stud., Working Paper No. 2013–12, 2013) [hereinafter Madison, *IP Things as Boundary Objects*].

9. Susan Leigh Star & James R. Griesemer, *Institutional Ecology, 'Translations' and Boundary Objects: Amateurs and Professionals in Berkeley's Museum of Vertebrate Zoology, 1907–39*, 19 SOC. STUD. SCI. 387, 393 (1989).

10. DOROTHY LEONARD-BARTON, *WELLSPRINGS OF KNOWLEDGE: BUILDING AND SUSTAINING THE SOURCES OF INNOVATION* (1995).

11. I note that some scholars have recently explored certain “negative spaces” where intellectual property rights are absent or limited. See Elizabeth L. Rosenblatt, *A Theory of IP's Negative Space*, 34 COLUM. J.L. & ARTS 317, 322–36 (2011) (reviewing the “negative space” literature). Despite somewhat similar terminology, my inquiry here into rhetorical spaces is quite different: patent disclosures might create rights by explicitly claiming them, or abnegate rights by explicitly limiting their scope. Patent silences may reciprocally create rights by implication or by failing to bound them; they may also relinquish rights by failing to assert them. Thus there is no necessary connection between patent silences and the absence of rights, and indeed, the more prolix a patent document becomes, the more limited its scope tends to be.

information about the claimed invention to the public.¹² Much of this commentary either assumes that robust technical disclosure is a key purpose for the patent system, or adopts at face value scattered dicta by the Supreme Court (as well as by inferior courts) asserting disclosure as a central policy of the patent system.¹³ Disclosure is said to be the price for the exclusivity conferred by the patent, making disclosure the *quid pro quo* of the inventor's bargain with the public. Enrichment of the fund of publicly available information is said to be a fundamental, if not *the* fundamental, purpose of the patent system. Starting from such premises, the scholarly literature critiques various aspects of the patent system for failing to optimize disclosure, and typically proposes one or another modification of the system to ensure more robust—meaning more voluminous and detailed—disclosure.¹⁴

Many of these proposals are driven by the somewhat naïve assumption that if some disclosure is good, more must be better. But as a general proposition this is simply an untrue, and even a dangerous, claim to make for nearly any good, whether we are speaking of information, oxygen, antibiotics, or single malt whiskey. Disclosure is costly and is not always beneficial. Not only is some disclosed information irrelevant, tangential, or useless, but information overload may make it increasingly difficult to locate pertinent and helpful information in an ocean of disclosure.¹⁵ Once the costs of disclosure pass the point of diminishing returns, more is no longer better.

A variation on assertions regarding the virtue of disclosure is that regarding the virtue of certainty: the argument that a more detailed patent specification provides a more particular and complete description of the claimed invention, and so provides greater certainty as to the nature of the patent claims. A first questionable assumption underlying this assertion is that more words lead to more certainty as to meaning. While it is true that more information generally lends greater certainty than does less information,¹⁶ and more words offer

12. See, e.g., *supra* note 2 and sources cited therein.

13. See *J.E.M. Ag Supply, Inc. v. Pioneer Hi-Bred Int'l, Inc.*, 534 U.S. 124, 142 (2001) (discussing the role of disclosure); *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 481 (1974) (same); *Brenner v. Manson*, 383 U.S. 519, 533–34 (1966) (explaining the purposes of disclosure).

14. See, e.g., *supra* note 2 and sources cited therein.

15. See generally JONATHAN B. SPIRA, *OVERLOAD! HOW TOO MUCH INFORMATION IS HAZARDOUS TO YOUR ORGANIZATION* (2011) (describing individual and organizational costs of information processing).

16. Indeed, one definition of information involves the resolution of uncertainty. See CLAUDE E. SHANNON & WARREN WEAVER, *THE MATHEMATICAL THEORY OF COMMUNICATION* 29 (10th ed. 1964); see also Dan L. Burk, *The Problem of Process in Biotechnology*, 43 HOUS. L. REV. 561, 563, 584–88 (2006) (applying information theory to process patents); Deven R. Desai,

an opportunity to convey more information, given the intractable incompleteness of language, this assumption only holds true up to a point. Some uncertainty will always remain, no matter how extensive the disclosure.¹⁷

A second dubious assumption underlying this version of disclosure is that uncertainty is undesirable because it is costly: that ambiguity or vagueness in the demarcation of the patent will lead either to strategic manipulation by the patent holder, who will be unconstrained by the irrefutable detail of a comprehensive text; or that it will lead to apprehension among competitors, who will be anxious over the potential reach of the indeterminate document; or that it will lead to both. Again, the assumption that uncertainty, whatever its costs, can be fully eliminated is doubtful. In addition, it is well understood that excessive certainty in the law can also be costly.¹⁸ A large literature details the drawbacks of enshrining in law overly rigid and static imperatives, the benefits of sometimes allowing for legal flexibility, and the circumstances under which each approach may yield better outcomes.¹⁹ Prematurely locking regulatory requirements into a course of action, or failing to incorporate changing factual situations into legal decisions, inevitably creates a mismatch between the law and the regulatory subject, resulting in inefficient and ineffective over- or under-regulation. Leaving the regulation open, with details to be supplied later, is frequently the better strategy.

A. Form and Function

Given such countervailing considerations, one might question on its own terms the line of argument asserting that more patent disclosure would be better. But one might also simply question the fundamental premise that disclosure is central, or even important, to patenting. Critiques of the mismatch between patent praxis and disclosure policy might be well-founded if one accepts the core

Response: An Information Approach to Trademarks, 100 GEO. L.J. 2119 (2012) (applying information theory to trademarks); Jeanne Fromer, *An Information Theory of Copyright Law*, 64 EMORY L.J. 71 (2014) (applying information theory to copyright).

17. See Margaret Jane Radin, *Patent Notice and the Trouble with Plain Meaning*, 96 B.U. L. REV. 1093 (2016).

18. *Id.* at 1113–14.

19. See, e.g., Dan L. Burk, *Muddy Rules for Cyberspace*, 21 CARDOZO L. REV. 121 (1999); Jason Scott Johnston, *Bargaining Under Rules Versus Standards*, 11 J.L. ECON. & ORG. 256 (1995); Marc R. Poirier, *The Virtue of Vagueness in Takings Doctrine*, 24 CARDOZO L. REV. 93 (2002); Carol M. Rose, *Crystals and Mud in Property Law*, 40 STAN. L. REV. 577, 594 (1988); Michael Spence & Timothy Endicott, *Vagueness in the Scope of Copyright*, 121 L.Q. REV. 657, 661 (2005).

assertion, or assumption, that disclosure is a key feature of the patent system. If disclosure is a key feature of patents, and patent doctrine does not provide for it, or does not provide enough of it, then it follows as night follows day that there is something wrong with patent doctrine. But I suggest that there is no particular reason to adopt this stance over the converse proposition: that the patent system is operating satisfactorily, perhaps even optimally, and the supposed mismatch stems from incorrect assertions regarding its purpose.

If we provisionally adopt the latter hypothesis, that it is the assertions regarding disclosure that are mistaken and need correcting, then we are left with the question as to how they should be corrected, and also with the corollary question as to how we will know what corrections are needed. I suggest that the answer to such questions is to be found in the patent system itself, by observing what the system is actually doing and then considering whether it is performing that manifest function well. The method for such consideration is to take the patent itself, the bundle of doctrines that determine disclosure, and with fresh eyes examine it to determine its features, then assess what functions those features might be suited to perform. By treating the patent much as an archaeologist or anthropologist would treat any other human artifact, cataloging its characteristics and affordances, we may draw an inference as to its actual purposes.

Thus, if I believe that the purpose of a screwdriver is to drive nails—perhaps because the Supreme Court made this assertion somewhere—and examine the screwdriver, I will certainly conclude that it is likely to fail in that purpose and that it needs radical redesign. It is manifestly poorly designed for driving nails. The screwdriver very obviously does not have the weight or the kind of level contact surface that would facilitate driving nails; it does not appear to provide the grip one would want for driving nails. I might well argue that the flat, flared tip, narrow shaft, and oblong grip should be reconfigured to something with real weight at one end, a level pounding surface, and longer haft—in short, that it should look something more like a hammer.

On the other hand, if I examine the screwdriver without prior expectations, essentially as a new object, the subject of a sort of anthropological inquiry that looks at its features and asks what uses its actual design might allow, I am similarly unlikely to conclude that it is good for driving nails. But I might notice that its long narrow shaft and chiseled tip lend themselves to very different uses. I might well conclude that it is admirably fashioned for something like driving screws (or possibly for use as an ice pick). If I perhaps further observe how it is in fact used, and then consider whether it seems to be a good

tool for that manifest use, I am likely to notice that it is generally used for driving screws, not nails, and that it actually appears to be fairly well designed for its actual use. Most importantly, redesigning it as a hammer would not improve it for screw-driving purposes and would instead probably make it unusable for its actual employment. Rather than reformulating the screwdriver, I might do better to reformulate my understanding of the screwdriver as it exists.

II. MAPPING SILENCES

Although patents are not physical artifacts such as construction tools, they are human artifacts nonetheless, and they have a very particular design. The Supreme Court has said that they are intended as vehicles of disclosure, and numerous commentators have quite correctly pointed out that, if that is in fact their purpose, they are very poorly designed indeed. This mismatch between design and purpose might mean that patents need a thorough redesign. Or, the mismatch could simply mean that the Supreme Court justices (and others holding the same viewpoint) are profoundly mistaken. This would not be any great surprise. There is a vast academic literature, to which I and many others have contributed, pointing out how and when the Supreme Court has been mistaken, and sometimes profoundly mistaken, about what is going on with regard to patents.²⁰

Rather than uncritically accepting the disclosure trope, I have proposed to instead examine the design of patents without the disclosure preconception, to see what the design suggests that these artifacts are supposed to do, or at any rate how they are likely to be used. This creates a bit of a paradox, however. We are ultimately concerned with whether patents are suited for something besides disclosure, so we need to avoid making assumptions about disclosure while somehow keeping disclosure in mind. I propose to do so by inventorying patent silences, to see what patents do not and need not say. Such an examination of patent silences allows a fresh look at the reciprocal characteristics of patents, contrasting discursive spaces with discursive content.

There is, of course, a danger in this approach. Contrasting the discursive spaces of patents with their discursive content sets up a dualism reflected in the epigraph that heads this essay, a division between that which is articulated and that which goes unarticulated. I

20. See, e.g., Dan L. Burk, *The Curious Incident of the Supreme Court in Myriad Genetics*, 90 NOTRE DAME L. REV. 505 (2014) (discussing the incoherent Supreme Court jurisprudence regarding patentable subject matter); Rebecca S. Eisenberg, *Diagnostics Need Not Apply*, 21 B.U. J. SCI. & TECH. L. 256 (2015) (same).

am well aware of the danger of dualism, in particular the danger that switching to the reciprocal of a binary pair may be just as misleading as not switching.²¹ But a considerable measure of thought over the past several decades, in a variety of disciplines, has gone toward the question of identifying and traversing the dualisms that remain latent in our social constructs.²² This work suggests that much of the danger posed by dualisms occurs when they are unacknowledged and unrecognized. The first step toward traversing dualisms is to identify and characterize them.

In the present instance, traversing the apparent dualism begins with the recognition that silence is not monolithic, but contains multitudes. Much as does disclosure, silence encompasses a broad range of conditions and circumstances.²³ Silence often indicates an absence of information, but such an absence may stem from a variety of circumstances. Silence sometimes indicates concealment, that information has been actively and intentionally withheld. Silence may also indicate absent information that was forgotten, or unknown, or perhaps even unknowable. Silence may similarly indicate the absence of information that, while known or apprehended, cannot be put into words; in other words, information that is uncodifiable.²⁴ Silence may be purely functional, as ground to communicative figure, allowing discrete concepts to be perceived. Perhaps most importantly, silence, whether audible or textual, is just as often communicative as it is noncommunicative.²⁵

This general bestiary of silences applies to specific patent silences; they likewise stem from a variety of conditions. Patent silence may represent practical acquiescence to the demands of an examiner, rightly or wrongly. Or it may represent an incompatibility between some aspect of the invention and the regulatory or statutory criteria for patenting. Or it may represent the indescribability of tacit

21. See Burk, *supra* note 8.

22. See Dan L. Burk, *Copyright and the New Materialism*, in *INTELLECTUAL PROPERTY AND ACCESS TO IM/MATERIAL GOODS* 44, 45 (Jessica Lai & Antoinette Maget Dominicé eds., 2016) (noting that modern scholars are beginning to focus on the centrality of matter in their evaluation of copyright law).

23. See Muriel Saville-Troike, *The Place of Silence in an Integrated Theory of Communication*, in *PERSPECTIVES ON SILENCE* 3, 4–5 (Deborah Tannen & Muriel Saville-Troike eds., 1985) (explaining the various dimensions of silence); see also Michal Ephratt, *The Functions of Silence*, 40 *J. PRAGMATICS* 1909, 1912 (2008) (diagramming different types of silences).

24. Cf. Dan L. Burk, *The Role of Patent Law in Knowledge Codification*, 23 *BERKELEY TECH. L.J.* 1009 (2008) (explaining the patent system's impact on knowledge management).

25. Saville-Troike, *supra* note 23, at 4.

knowledge associated with the invention.²⁶ Or it may be calculated, strategic non-disclosure. It is due to the multiplicity of patent silences that I use the term silence here advisedly.²⁷ In speaking of patent silences as the antithesis of patent disclosure, I might have spoken in terms of patent non-disclosure, but that term carries connotations that I prefer not to invoke. I am interested in the empty spaces in the text, arising both from both non-disclosure and from the negative reciprocal of disclosure.

A. Mapping Disclosure

If we are to use patent silence to frame patent disclosure, it would be well at the outset to recognize that there are several different types of disclosure occurring in the patent document, or perhaps more accurately, to recognize that several different kinds of information are lumped together, perhaps improperly, under the generalized concept of disclosure. Many, though by no means all of these are associated with the disclosure provisions in § 112 of the patent statute.²⁸ Explicit in the text of the statute is the requirement that some have labeled the “teaching function” of the patent,²⁹ requiring the patentee to teach those of ordinary skill how to make and use the invention. Much of the recent commentary surrounding disclosure has focused on whether this function occurs well, or poorly, or at all.

But disclosure performs a number of other implicit functions as well. Discursive features of the specification that are mentioned in the statute, such as the written description requirement or claim definiteness, are typically justified or explained on the basis of some disclosure function that is unarticulated in the statute, and instead has been developed in judicial glosses. For example, the patent specification is said to perform a “notice function” by putting the public on notice as to what technology is off limits—that is, what technological bounds they would need to cross to trigger infringement liability.³⁰ At the same time the specification is also said to keep the

26. Indeed, for knowledge or practice that lies outside the articulated bounds of the patent, the intellectual property recourse is trade secrecy—an active form of silence that suppresses open disclosure, at least most of the time. Secrecy may be a strategic option for valuable information that might remain proprietary beyond the term of the patent, or it may be a necessary and unavoidable contingency for information that is tacit and uncodifiable. See Burk, *supra* note 24, at 1021.

27. Cf. Saville-Troike, *supra* note 23, at 5 (noting that writing, like speech, has silences).

28. 35 U.S.C. § 112 (2012).

29. See, e.g., Seymore, *supra* note 2.

30. *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2130 (2014).

inventor from overreaching, by specifying the limitations of the technology to which the inventor has claim.³¹ Patent disclosure is also said to indicate the inventor's "possession" of the claimed invention—that is, to demonstrate that the inventor can describe the technology in sufficient detail to ensure invention of what she claims.³²

Possession in this sense is clearly a term of art, as the inventor need not have physical or actual possession of the invention.³³ In the nineteenth century, patent applicants were required to submit a working model of their invention to the Patent Office as part of the process for obtaining a patent.³⁴ This practice has long since gone by the wayside in favor of purely textual elucidations of the invention. While there are occasional calls to renew versions of the old practice,³⁵ it is clear that a custom which might have made sense for nineteenth century applications that were primarily mechanical in nature would today be utterly impractical and logistically disastrous. Today's Patent Office receives well over 500,000 applications a year; setting aside the enormous problems of receiving, processing, and storing working models, it is unclear what it would mean to submit a "working model" for biological, chemical, and process-based inventions.

Such practicality dictates certain silences as well as their reciprocal disclosures. One mediation of the disclosure–non-disclosure boundary in patents may simply be required by relative costs and benefits; it is simply not feasible, nor even desirable, to maximize the information content of patents. Every patent drafter (or for that matter, any document drafter) knows that deliberate choices must be made regarding what to leave out of the specification, if only because the document at some point will begin to become unwieldy and prolix.³⁶ Complete disclosure would of course, in any event, be impossible, requiring some hypothetical Borges text that would

31. See *Gen. Elec. Co. v. Wabash Appliance Corp.*, 304 U.S. 364, 369 (1938); *Evans v. Eaton*, 20 U.S. (7 Wheat.) 356, 433–34 (1822).

32. *In re Gosteli*, 872 F.2d 1008, 1012 (Fed. Cir. 1989); see also *Holbrook*, *supra* note 2 (arguing for the primacy of the possession rationale in disclosure).

33. *Falkner v. Inglis*, 448 F.3d 1357, 1366–67 (Fed. Cir. 2006).

34. Alain Pottage, *Law Machines: Scale Models, Forensic Materiality, and the Making of Modern Patent Law*, 41 SOC. STUD. SCI. 621 (2011).

35. See, e.g., *Seymore*, *supra* note 2 (arguing that patent examiners should be able to demand working examples of applicants); see also *Ouellette*, *supra* note 3 (arguing that examiners must require applicants to "show their work").

36. This textual inevitability has long been recognized in contract theory. See *Oliver Hart & John Moore, Incomplete Contracts and Renegotiation*, 56 *ECONOMETRICA* 755 (1988) (arguing that parties to a contract make up for "incompleteness" by keeping the document susceptible to revision).

reference every aspect of the invention from first principles on.³⁷ Since complete disclosure within the document is neither possible nor desirable, the drafter is inevitably forced to rely upon knowledge external to the patent text, including, of course, the knowledge necessary to decipher and interpret the text.³⁸ The question then becomes how reliant on external knowledge the drafter is permitted to be.

Thus, patent doctrine fully expects that not all the information necessary to make and use the invention need be found in the patent document. To complete the information disclosed in the patent, the patent drafter is permitted to rely on the knowledge legally imputed to the person having ordinary skill in the art ("PHOSITA"),³⁹ including the basic knowledge common to practitioners in the field, the common terminology in the field, and the skills that would be fundamental to the particular field.⁴⁰ There is again some danger in relying on the knowledge common to the art; if the drafter remains silent on an essential topic, while also wrongly expecting that it would be part of the PHOSITA's fund of knowledge, then the disclosure remains incomplete and the patent fails the enablement requirement.

The corollary is that the PHOSITA is something of an idiot savant. The PHOSITA is presumed to have a thorough knowledge of all the prior art in a way that no natural entity possibly could, but its knowledge is limited to the field of invention.⁴¹ The PHOSITA may also have insights into other fields when they are relevant to the question the inventor was trying to solve.⁴² But this will never be enough to implement an invention in practice, and the missing practical information need not be supplied by the inventor. Black letter patent law tells us that the patent is not a production document; the inventor need not specify the precise location of every nut, bolt, solder, or sinter found in the invention.⁴³ And neither is the patent an operations manual. While the patent statute requires enablement of

37. Jorge Luis Borges was an Argentine writer whose stories frequently incorporated paradoxes on the infinite, such as his 1975 short story, *The Book of Sand*, concerning an unbounded fictional text. GENE H. BELL-VILLADA, BORGES AND HIS FICTION: A GUIDE TO HIS MIND AND ART (1999). Similar concepts appear in other stories, such as the 1941 story, *The Garden of Forking Paths*, which revolves around a labyrinthine novel in which multiple plot lines occur simultaneously. *Id.* at 101.

38. See Burk, *supra* note 24, at 1016.

39. John O. Tresansky, *PHOSITA—the Ubiquitous and Enigmatic Person in Patent Law*, 73 J. PAT. & TRADEMARK OFF. SOC'Y 37 (1991).

40. *In re Wands*, 858 F.2d 731, 735 (Fed. Cir. 1988).

41. *In re Rouffet*, 149 F.3d 1350, 1357 (Fed. Cir. 1998).

42. *In re Wood*, 599 F.2d 1032, 1036 (C.C.P.A. 1979).

43. *In re Gay*, 309 F.2d 769, 774 (C.C.P.A. 1962).

the invention,⁴⁴ it does not necessarily require information to enable the network of apparatus and practices that must unquestionably surround the invention—the maintenance schedule, operator training, safety procedures, tax consequences, management oversight, and so on.⁴⁵ Some of these details may be filled in by those of skill in the art, but much of this silence requires the expertise of those in other arts, such as accounting or human resources, which may be entirely unrelated to the field of the invention.

B. Optional Silences

And so here I begin to trace the outline of the unspoken intervals in the patent document. Patent silences are often the reciprocal spaces defined by the contours of affirmative disclosures, the information that goes unarticulated after disclosure ends or runs out. Indeed, patent silences are most often just that: the disclosure comes to an end, and whatever lies beyond that revelation goes undiscussed. Such lacunae are determined negatively by the strategy or purpose of the disclosure; once the purpose of the disclosure has been satisfied, the drafter falls silent.

But in some cases, the silence is explicit and formalized; patent doctrine affirmatively identifies a particular topic or feature of the invention regarding which nothing need be said. In other cases, silence is the inevitable result of the inventor being required to speak or disclose information in a certain way, which precludes disclosure in any other way. In a few cases the inventor is affirmatively forbidden from addressing certain information. More often the silence is permissive; the inventor may offer certain information but need not do so. Where silence is permissive, there is often a penalty for either intentionally or inadvertently misjudging the degree of reticence allowed.

For example, patents may include working examples, that is, a description of an embodiment or utilization of the invention that has actually been performed. But it is black letter patent law that working examples are not required; indeed, the invention need not have been actually reduced to practice prior to filing a patent application.⁴⁶ The patent drafter can substitute other kinds of disclosures sufficient to enable the invention. Examples, if they are offered at all, may be

44. 35 U.S.C. § 112(a) (2012).

45. Burk, *supra* note 24, at 1021.

46. Hyatt v. Boone, 146 F.3d 1348, 1352 (Fed. Cir. 1998).

“prophetic” or hypothetical.⁴⁷ There may of course be advantages to including a working example, as it can provide a concrete embodiment that helps stave off a potential Patent Office rejection for lack of enablement. Yet, at the same time, including prophetic examples may be something of a risk to the applicant, as failure of the prediction would render the patent non-enabled and it might have been better to have remained silent. The applicant, or patent drafter, is left to weigh the benefits and risks and determine whether to stay silent regarding working examples.

This is also generally the case where disclosures are required. As a practical matter, the applicant prognosticates the needed level of disclosure—the degree of disclosure required by law is almost entirely set at the time of filing, so that what is disclosed needs to be disclosed as of the filing date.⁴⁸ With few exceptions, the examiner who believes the disclosure is inadequate has little ability to demand additional information, at least with regard to that application. During the course of administrative patent prosecution, amendments are made to the claims, not to the rest of the specification, and disclosure is judged in relation to the claims—if the disclosure is inadequate to support the claims, the claims must be narrowed. But the opposite is not true: it is essentially forbidden to expand or refine the disclosure to shore up overbroad claims, and if the disclosure is so defective that it cannot support any claims, the application might be rejected or go abandoned.

The patent applicant’s choice between silence and disclosure is frequently mediated by procedural presumptions, for example, in the case of the patentability requirement to show utility. The patent applicant is generally not required to prove utility in the operational sense, only to state some plausible use.⁴⁹ The assertion of such utility by the applicant is generally assumed to be true, unless on its face the application is so far removed from the established tenets of science and engineering so as to constitute “fantastic utility.”⁵⁰ Applications drawn to perpetual motion machines or other devices that obviously violate physical law will be flagged by the examining corps and rejected. Only then does the applicant who wishes to proceed need to produce data, models, or other evidence that the invention is operable. But such supplemental submissions are tendered as evidence supporting the assertions already existing in the application, not as a

47. *In re Strahilevitz*, 668 F.2d 1229, 1232 (C.C.P.A. 1982).

48. See Mark A. Lemley, *The Changing Meaning of Patent Claim Terms*, 104 MICH. L. REV. 101, 106–07 (2005) (noting that it “makes sense” that the terms of the claim are established by the date of application).

49. *In re Swartz*, 232 F.3d 862, 864 (Fed. Cir. 2000).

50. *In re Brana*, 51 F.3d 1560, 1566 (Fed. Cir. 1995).

broadening of the disclosure itself; neither are they incorporated into the application itself, although they will be included in the prosecution history.

C. Unaddressed Audiences

Patent disclosure is purportedly intended to convey details of the invention to a reader and to put the reader on notice as to what technology is exclusive. The expectation that patents perform these functions for certain audiences dictates the degree of disclosure necessary to *that audience*.⁵¹ The patent may be silent with regard to other audiences besides those contemplated for disclosure. So in cataloging patent silences we may ask: To whom are patents *not* addressed? To what audiences may patents remain silent?

Others have previously observed that patents are addressed to technical experts.⁵² For our purposes, this observation is a bit incomplete but remains a good place to start. Given that the disclosure is by statutory terms directed to enabling those of skill in the art,⁵³ this statutory provision conversely implies that patents are *not* addressed to those *without* skill in the art. There is no requirement that the patent school the unskilled. The patent may remain silent on matters that those of skill already know, and need not speak to the unskilled who know less. This unaddressed audience includes both those in the art who do not have the ordinary level of skill and those who are entirely outside the art. And despite occasional judicial language regarding notice to the public, the language of the statute indicates that the patent is decidedly not addressed to the lay public.⁵⁴

This also implies that the patent is ostensibly not addressed to judges, nor to lawyers, who at first glance would not seem to be those of skill in the art. But we should perhaps not embrace that conclusion too quickly. First, the patent document is likely to be written by a lawyer, albeit a lawyer with technical training.⁵⁵ In order to practice before the Patent Office, a patent lawyer or agent is required to have a technical background. If it is ever licensed or enforced, the document

51. See Mark D. Janis & Timothy R. Holbrook, *Patent Law's Audience*, 97 MINN. L. REV. 72 (2012); see also Jeanne C. Fromer & Mark A. Lemley, *The Audience in Intellectual Property Infringement*, 112 MICH. L. REV. 1251, 1262–63 (2014) (observing that patent claims are addressed to an “expert” audience).

52. See Fromer & Lemley, *supra* note 51.

53. 35 U.S.C. § 112(a) (2012).

54. See Fromer & Lemley, *supra* note 51.

55. See Burk & Reyman, *supra* note 5, at 176 (describing the requirement of technical training for patent lawyers).

will be interpreted by lawyers who may not have technical training.⁵⁶ Certainly if it is enforced it will be interpreted by trial judges without technical training. Thus as a practical matter, the document is written by lawyers for lawyers, even if that is not what the statute specifies.⁵⁷

Second, and perhaps surprisingly, patents are not addressed to inventors, or at least not to inventors whose skill rises to the level needed for patentable invention. Inventors are by definition those of *extraordinary* skill in the art; if what an innovator accomplishes can be accomplished by one of ordinary skill, it fails the non-obviousness test for patentability.⁵⁸ Thus the inventor who addresses a patent to her peers, to those of extraordinary skill, fails the statutory enablement requirement—the disclosure must be accessible and comprehensible, to one of merely ordinary skill.

Neither is the patent addressed to patent examiners, or at least the statute does not require this. As a practical consideration, patent examiners will review the application and are as a matter of course an important audience to keep in mind. But so far as patenting requirements go, even though patent examiners may be among those of at least ordinary skill in the art, they are not the audience. It is critical here to remember that the statute does not require the document to be accessible to any *actual* individuals of skill in the art. And while examiners are certainly individuals of skill in the art, they are not the fictional PHOSITAs, as those are contemplated in the statute.⁵⁹ The PHOSITA is a legal standard, not any actual person or group of persons,⁶⁰ so comprehensibility to the fictional PHOSITA may or may not translate into comprehensibility by natural entities.

With regard to actual persons of skill, arguments over the degree to which patents are in fact useful to technicians have been a mainstay of disclosure scholarship.⁶¹ Patents are indeed couched in technical terms and to some extent communicate technical information, if perhaps not in the degree of detail that a technical

56. *Id.* at 178.

57. See John M. Golden, *Construing Patent Claims According to Their "Interpretive Community": A Call for an Attorney-Plus-Artisan Perspective*, 21 HARV. J.L. & TECH. 321, 334 (2008).

58. 35 U.S.C. § 103 (2012).

59. See Rebecca S. Eisenberg, *Obvious to Whom? Evaluating Inventions from the Perspective of PHOSITA*, 19 BERKELEY TECH. L.J. 885, 888 (2004); Tresansky, *supra* note 39, at 50–54.

60. *Custom Accessories, Inc. v. Jeffrey-Allan Indus., Inc.*, 807 F.2d 955, 962 (Fed. Cir. 1986) (“The person of ordinary skill is a hypothetical person . . .”).

61. See *supra* note 2 and sources cited therein.

community might demand.⁶² Certainly the patent disclosure must be technically sufficient for the claimed invention to have some purchase in the material world; enablement demands that what is described must work in an operational sense.⁶³ But as I have pointed out in previous work, the technical description encompassed by the patent is not that demanded by an actual technician, but rather that geared to the PHOSITA, a construct fashioned by lawyers.⁶⁴ Thus, as a legal matter, the patent need not speak to the examiner or even to other natural artisans so long as it speaks to the PHOSITA.

Further, the characteristics of the PHOSITA are largely defined, not by reference to natural artisans, but by reference to a defined set of documents.⁶⁵ These constituent texts, which are not necessarily incorporated into or even explicitly referenced by the patent text, are in turn the aggregate standard by which patentability is determined. The definition of the invention requires both separation from, and relation to, such prior art.⁶⁶ For example, in order to satisfy the novelty requirement, the claimed invention must be distinct from what has gone before; to satisfy the non-obviousness requirement, it must be significantly distinct from what has gone before. Even to qualify as patentable subject matter, the Supreme Court has said that the invention must—in some fashion that is not entirely clear—surpass what has gone before.⁶⁷ Much of the patent disclosure therefore characterizes the invention as a figure against the ground of the prior art. But that means that it is the differences from the prior art that will be emphasized in the patent, and routine similarities will often go unstated—additional defining silences.

62. See David Phillip Miller, *Watt in Court: Specifying Steam Engines and Classifying Engineers in the Patent Trials of the 1790s*, in 27 HISTORY OF TECHNOLOGY 44, 45–46 (Ian Inkster ed., 2007); Greg Myers, *From Discovery to Invention: The Writing and Rewriting of Two Patents*, 25 SOC. STUD. SCI. 57, 93 (1995).

63. See Geof Bowker, *What's in a Patent?*, in SHAPING TECHNOLOGY/BUILDING SOCIETY: STUDIES IN SOCIOTECHNICAL CHANGE 53, 69 (Wiebe E. Bijker & John Law eds., 1994) (describing the process of aligning material practice with patent assertion).

64. See Burk & Reyman, *supra* note 5, at 182; see also Golden, *supra* note 57, at 327 (arguing that patent claims must address both technical operability and legal meaning).

65. I say here “largely,” because the Supreme Court has suggested that patents may be at least partly based upon “common sense” and other practical instincts that may not be recorded in the prior art. See *KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 421 (2007).

66. Myers, *supra* note 62, at 84.

67. *Alice Corp. Proprietary Ltd. v. CLS Bank Int'l*, 134 S. Ct. 2347, 2357 (2014) (holding that patentable subject matter must entail an “inventive concept”).

D. Claiming Silence

Much of patent silence clusters around the claims. Patent disclosure is often associated with the "specification," which is the detailed written description of the invention. Those who have not practiced in the patent field (as well as more than a few of those who have) tend to forget that claims are part of the patent specification.⁶⁸ There is a tendency to speak casually of the non-claiming portions of the document—the drawings, the examples, the textual description—as the specification. But in fact the claims work together with the rest of the disclosure to specify the characteristics of the invention. And, conversely, we can infer that claims work together with non-disclosures to specify the characteristics of the invention.

Perhaps more importantly, the claims work in a very real sense *against* the rest of the disclosure, in a kind of dynamic tension that constrains the scope of exclusivity. The enablement standard requires disclosure commensurate with the claims: the claims must be supported by the disclosure, and the breadth of the disclosure dictates the permissible breadth of the claims.⁶⁹ This creates both parallel and reciprocal relationships between the respective disclosures and silences in the claims and in the rest of the supporting document. If the applicant discloses more, she can claim more; if the applicant discloses less, then she must claim less. This creates a relationship between disclosures and silences. The applicant may remain silent on matters she does not wish to claim, and there may in fact be penalties for disclosing and not claiming aspects of an invention; these may be effectively dedicated to the public.⁷⁰

Thus, the claims exist not only in tension with the remainder of the specification, but in a kind of symbiosis. The claims are not and need not be a full exposition of the invention—where the claims are silent, needed information may be referenced elsewhere in the patent. Every patent student knows that the claims are to be read in light of the disclosure in the rest of the specification.⁷¹ But at the same time, the claims must to some degree stand on their own; there remains a strict prohibition on reading into the claims limitations drawn from elsewhere in the specification.⁷² The line between these two demands is indeterminate, often leaving the observer to wonder how these rules

68. *In re Benno*, 768 F.2d 1340, 1346 (Fed. Cir. 1985).

69. *Nat'l Recovery Techs., Inc. v. Magnetic Separation Sys., Inc.*, 166 F.3d 1190, 1196 (Fed. Cir. 1999).

70. *Pfizer, Inc. v. Teva Pharm., USA, Inc.*, 429 F.3d 1364, 1379 (Fed. Cir. 2005).

71. *Standard Oil Co. v. Am. Cyanamid Co.*, 774 F.2d 448, 452 (Fed. Cir. 1985).

72. *Specialty Composites v. Cabot Corp.*, 845 F.2d 981, 987 (Fed. Cir. 1988).

could possibly coexist. But they define a very particular range of permissible silence between the claims and their supporting texts.

Certain silences within the claims may be filled, if at all, by information not found in the patent itself. The claims may, for example, use terms undefined in the patent, so long as they are known in the art, thus relying again on the fabricated universe of prior art known to the PHOSITA.⁷³ Patent claims may also remain silent regarding embodiments of the invention that fail to function. Broad genus claims, covering entire classes of invention, may well encompass both functional embodiments of the invention and others that do not work. But existence of the latter inoperable species of the invention within the scope of the claims neither defeats the claimed invention's utility nor negates its enablement. It is sufficient for the patentee to supply guidance as to how inoperable species may be recognized and avoided.⁷⁴ For that matter, the patentee need not disclose inoperable species, or even how to identify and avoid inoperable species, if this is knowledge that the PHOSITA would already possess.⁷⁵

E. Temporal Silences

Some patent silences are a function of time.⁷⁶ There are, for example, strong incentives for inventors to remain silent concerning discoveries related to the invention that are made subsequent to their patent filing. Applicants are forbidden from introducing "new matter" into a pending application; changing the application disclosure changes the definition of the invention, so that what is under consideration becomes in effect a new application.⁷⁷ The clock then starts over, with a new priority date for the new application concerning the new invention—potentially a serious handicap in a system that rewards the first to file. In effect, the applicant is not permitted to change her mind regarding the nature of the invention; she is limited to the invention as described on the filing date.

This restriction on new matter serves to stabilize the version of the invention under consideration during the application process. Yet

73. *Ga.-Pac. Corp. v. U.S. Plywood Corp.*, 258 F.2d 124, 136 (2d Cir. 1958); *Standard Oil Co. v. Am. Cyanamid Co.*, 585 F. Supp. 1481, 1488 (E.D. La. 1984), *aff'd*, 774 F.2d 448 (Fed. Cir. 1985).

74. *See In re Wands*, 858 F.2d 731, 736–37 (Fed. Cir. 1988).

75. *Atlas Powder Co. v. E.I. Du Pont de Nemours & Co.*, 750 F.2d 1569, 1576–77 (Fed. Cir. 1984).

76. *Cf. Timothy R. Holbrook, Patent Disclosures and Time*, 69 VAND. L. REV. 1459 (2016) (exploring how the nature of patent disclosures varies based on the temporal contexts being considered).

77. 35 U.S.C. § 135 (2012).

technology advances over time, and the inventor's understanding will likely advance, not just during the lifetime of the patent, but during the course of the patent application process. The best that can be done with incremental changes to the technology is to file continuations in part ("CIPs"), in which the new matter accrues a new filing date, and the portions of the disclosure that are carried forward from the previous version of the application retain the original filing date. But if the new discoveries or understanding are not themselves patentable, they will not be reflected in CIPs and will go undisclosed.

At the same time, other patent silences may serve to passively incorporate advances in technology. Thanks to the new matter rule, the patent is, of course, silent on the characteristics of technical advances subsequent to its drafting; neither the inventor nor the patent drafter are required to be precognitive. But patent doctrine allows the scope of the document to progress over time, permitting the silence regarding technical advances to become infused with meaning as technology changes.⁷⁸ The patent thus routinely covers technologies that it did not, and indeed that it could not, disclose at the time of filing.⁷⁹

Such patent doctrines incorporate features that address the changing context of the patent's exclusivity. Probably the best known of these is the enablement paradox, which allows the patent to encompass new versions of an invention subsequent to the patent filing date so long as the version of the invention contemporary with its application date is fully enabled.⁸⁰ Kevin Collins has suggested that this characteristic is not so much temporal as it is a type of modulation between ideational and denotational meanings in the document; for purposes of patentability the meaning of the disclosure must be referential, while for purposes of infringement it is conceptual.⁸¹ In either conception, the doctrine allows the patent to encompass new technical developments.

A similar doctrine appears in the context of the Doctrine of Equivalents, under which the patent's claims are regarded as encompassing known substitutes for elements of the claimed invention. This penumbra of exclusivity prevents infringers from making trivial changes to their devices in order to avoid the literal

78. *In re Fisher*, 427 F.2d 833, 839 (C.C.P.A. 1970).

79. *U.S. Steel Corp. v. Philips Petroleum Co.*, 865 F.2d 1247, 1251-52 (Fed. Cir. 1989); *In re Hogan*, 559 F.2d 595, 606 (C.C.P.A. 1977).

80. *U.S. Steel Corp.*, 865 F.2d at 1251-52.

81. See Kevin Emerson Collins, *Enabling After-Arising Technology*, 34 J. CORP. L. 1083, 1099-1100 (2009).

text of the claims.⁸² But at the same time, patent holders are not permitted to capture within their equivalents penumbra embodiments of the invention that they previously represented to the Patent Office were not part of the invention—the scope of equivalents is limited by this doctrine of prosecution history estoppel.⁸³ The Supreme Court has also indicated that such estoppel is limited to substitutions within the contemplation of the art at the time the patent was obtained.⁸⁴ In other words, substitutions that were not foreseeable at the time that the patentee surrendered a range of equivalents by estoppel are not excluded from the later scope of the patent's exclusivity. Thus, the range of equivalents may include later-arising technology.

III. PATENTS AT THE BOUNDARY

Although there are undoubtedly additional lacunae to be explored within patent doctrine and practice, the survey of silences I have undertaken to this point should convey a palpable outline of the document's contours. It is clearly a document for which disclosure is not paramount, entertaining not simply a few unintended omissions, but multiple deliberate silences. It is a document in which certain spaces are meant to be filled by an attendant constellation of concurrent and prior documents, but in which certain spaces are meant never to be filled at all. It is a document whose meaning is not intrinsic, but is rather dependent on the legal and technical communities that surround it. It is a document whose content shifts with context, where certain dimensions are fixed at particular points in time, but whose meaning in other respects changes over time.

As I have suggested above, this profile may not lend itself wholly, or even primarily, to the purposes of teaching or notice, but it surely has its purposes. In particular, these features map surprisingly well onto the extensive literature investigating "boundary objects." Beginning in sociology, and then increasingly in myriad other disciplines, research has recognized artifacts that function at the boundaries, or the overlap, between different social worlds. These boundary objects exist at the intersection of different communities,

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

83. *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 733–35 (2002).

84. *Id.* at 738–41. Silence in the file wrapper may itself trigger prosecution history estoppel: an unexplained narrowing claim amendment that excludes equivalents is presumed to be related to "patentability" and so falls into the category of amendments that later estop assertion of those equivalents. See *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17 (1997). Such silence is ostensibly outside the patent document—one does not explain amendments in the patent itself—but demonstrates that silences in the documents attending the patent may impact the contours of the patent.

belonging to different domains without fully belonging to any of them.⁸⁵ Boundary objects have a different identity and meaning in each of the multiple domains that they inhabit.

But the boundary object is not simply an artifact that is viewed differently in different contexts—were that its only attribute, nearly anything at any time could qualify as a boundary object.⁸⁶ Rather, the boundary object has a tightly structured role and meaning within a given social world, but is also sufficiently loosely structured that it can be imbued with different meanings in other social worlds. Star and Griesemer, who famously originated the notion of the boundary object, define the concept as comprising “objects which are both plastic enough to adapt to local needs and the constraints of the several parties employing them, yet robust enough to maintain a common identity across sites.”⁸⁷

These features of the boundary object provide a point of commonality where disparate communities can collaborate and where contested meanings can be negotiated. In doing so, they facilitate communication and cooperation between social domains, and allow resolution of disparate interests that potentially conflict. This is not to say that the resolution consists of consensus; rather, the alignment of interests via boundary objects typically permits different interests to coexist without conformity. Boundary objects allow their different constituencies to collaborate on shared work while retaining differing and even conflicting interests. To do so, boundary objects must be simultaneously fluid *and* stable, depending on the context in which they are employed and depending on whether they are functioning locally or between localities.

Bowker and Star argued that boundary objects tend to arise organically in order to mediate the interaction of disparate communities, but deliberately engineered boundary objects have also been observed.⁸⁸ Attempts to create boundary objects may fail because the engineered objects lack the needed ambiguity to become simultaneously useful to members of multiple domains.⁸⁹ To function as a boundary object, an artifact acquires local meaning as each social world infuses the artifact with significance. But this can only occur at the interstices of the object, where the particular affordances of the object are sufficiently multivalent to accommodate different social

85. Star & Griesemer, *supra* note 9, at 411.

86. See Star, *supra* note 7.

87. Star & Griesemer, *supra* note 9, at 393.

88. GEOFFREY C. BOWKER & SUSAN LEIGH STAR, SORTING THINGS OUT: CLASSIFICATION AND ITS CONSEQUENCES 305–06 (1999).

89. *Id.*

meanings. Thus, ambiguity or incomplete social structuring of the object allows communities to imbue the object with their own content and interpretation.⁹⁰

It is this modulation between abstraction and specificity that allows an object to function at the overlapping margins of different social worlds, and, critically, to serve as a “passage point” for information between social worlds. In particular for our consideration here, these characteristics allow boundary objects to perform an important role in fostering innovation.⁹¹ Studies of innovation, and particularly of innovation within organizational settings, indicate that innovation is most likely to occur when information is combined across specialized domains, producing new combinations of previously sequestered knowledge.⁹² Separation of specialized information thus presents both an opportunity for and an impediment to innovation. Boundaries between specialties create the opportunity for innovation when information transfer occurs across them, and simultaneously present a barrier to innovation that inhibits such information transfer.⁹³

This implies that innovation requires some mechanism for transfer across disciplinary barriers while at the same time maintaining such barriers. Boundary objects are superbly positioned to simultaneously perform both functions, and studies of information transfer have recognized the central role played by boundary objects in performing such seemingly contradictory roles.⁹⁴ Typical boundary objects that have been studied in the organizational setting include documents such as blueprints or design specifications, as well as scale models, databases, and similar informational resources.⁹⁵ All of these may provide useful information to their constituent user communities, but they more importantly have been seen to provide points of interaction and negotiation. For such informational artifacts, textual

90. Elaine K. Yakura, *Charting Time: Timelines as Temporal Boundary Objects*, 45 *ACAD. MGMT. J.* 956, 957–58 (2002).

91. Paul R. Carlile, *A Pragmatic View of Knowledge and Boundaries: Boundary Objects in New Product Development*, 13 *ORG. SCI.* 442 (2002); Chris Kimble, Corinne Grenier & Karine Goglio-Primard, *Innovation and Knowledge Sharing Across Professional Boundaries: Political Interplay Between Boundary Objects and Brokers*, 30 *INT'L J. INFO. MGMT.* 437 (2010).

92. See LEONARD-BARTON, *supra* note 10, at 59–61.

93. Carlile, *supra* note 91, at 442.

94. *Id.*; Paul R. Carlile, *Transferring, Translating and Transforming Knowledge: An Integrative Framework for Managing Knowledge Across Boundaries*, 15 *ORG. SCI.* 555, 555 (2004).

95. Clifford Oswick, *Boundary Objects and Organizational Knowledge: A Discursive Perspective* 7–8 (University of Leicester Management Centre, Working Paper, 2005), <http://www2.warwick.ac.uk/fac/soc/wbs/conf/olkc/archive/oklc6/papers/oswick.pdf> [<https://perma.cc/8PEY-262M>].

ambiguities or lacunae offer opportunities for local interpretation or for interstitial negotiation, while points of textual particularity offer commonality across boundaries.

Patents fit fairly naturally into the schema of such resources; the patent document may facilitate movement of technical information between technical communities of practice, but, like analogous informational boundary objects, this is likely the least of its functions.⁹⁶ Rather, the contours that I have here identified, of patent particularity and silence, suggest that the patent may operate as a boundary object, mediating the interaction of multiple communities that surround the document. While the patent is a common object in these different communities, it has different significance in each of them, and is adapted to different uses in each of the different communities clustered around it.⁹⁷

There has already been some initial recognition of the knowledge communities surrounding patent practice. For example, Professor Laura Pedraza-Fariña has explored influence of patent law's obviousness doctrine as it relates to innovation among communities of practice.⁹⁸ Relatedly, in previous work with Professor Jessica Reyman, I have discussed the multiple rhetorical communities that surround the creation and enforcement of the patent document: practitioners, litigators, inventors, technology transfer officers, patent examiners, judges, and others engaged in shaping the "typified social action" of patent texts.⁹⁹ This point may be taken further, to consider the communities that intersect at the patent document in regard to technological development and commercialization.

As a hybrid document,¹⁰⁰ written and interpreted by lawyers in technical language, intended as a market commodity, the patent has a

96. Mark Lemley appears to offer indirect evidence of this view when he observes that a substantial body of empirical data shows behavior regarding patent procurement and enforcement appears completely unperturbed by significant changes in patent doctrine. See Mark A. Lemley, *The Surprising Resilience of the Patent System* 19–20 (Stanford Public Law, Working Paper No. 2784456, 2016), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2784456 [<https://perma.cc/YL6E-SX5Q>]. The most plausible interpretation of this behavior seems to be that, whatever patents are being used for, it has little to do with the legal characteristics attributed to the document. *Id.*

97. In a discussion of copyrighted works as boundary objects, Mike Madison mentions in passing the likely provenance of the patented invention as a boundary object. See Madison, *IP Things as Boundary Objects*, *supra* note 8. While I would not necessarily disagree with that observation, my focus here is broader than the concept of the invention, considering the patent document and its multiple associated valences as boundary objects.

98. See Laura Pedraza-Fariña, *Patent Law and the Sociology of Innovation*, 2013 WIS. L. REV. 813.

99. See Burk & Reyman, *supra* note 5, at 175.

100. See *id.* at 185.

foothold in multiple communities that generally must interact in order for innovation to occur: engineering and technical experts, legal practitioners, investors, business planners, marketers, manufacturers, and others. Each of these communities encompasses its own specialized language, goals, norms, expectations, practices, and training. These actors have heterogeneous interests drawn from the norms and expectations of their different fields: advancing knowledge, turning a profit, finding elegant technological solutions, enhancing the organization's reputation, placating shareholders, outmaneuvering competitors, and so on. These goals are not necessarily consonant or even congruent.

Thus, each of the relevant communities will tend toward a different view of the patent's significance and purpose.¹⁰¹ Some view the patent as a potential source of licensing revenue or as a bargaining chip in strategic alliances. Some may view it as an indicator of firm value. Some may view it as a marker of technological expertise. Some view it as a marketing asset or as an advertising feature.¹⁰² Some may view it as an impediment to freedom to operate or as a warning against entering certain technological areas. But in order for innovation to occur, actors from these disparate social worlds typically will need to collaborate, meaning that there is a need for specialized knowledge transfer between them—the licensing officer needs to understand the capabilities of the technology; the business planner needs to understand the scope of the available rights; the technologist needs to understand which information is required to support the legal assertions of novelty, utility, and non-obviousness.

The interaction of these differing communities becomes manifest if we consider the multiple converging purposes in an act such as patent licensing.¹⁰³ The patent will presumably only be licensed if it meets the business and technical requirements of the licensee's organization; it must also further the business and legal

101. See Mark A. Lemley, *Reconceiving Patents in the Age of Venture Capital*, 4 J. SMALL & EMERGING BUS. L. 137, 143 (2000) (analyzing how patents are viewed in various industries).

102. See, e.g., Ann Bartow, *Separating Marketing Innovation from Actual Invention: A Proposal for a New, Improved, Lighter, and Better-Tasting Form of Patent Protection*, 4 J. SMALL & EMERGING BUS. L. 5 (2000); Mercedes Benz, *2013 Mercedes Benz E 350 TV Commercial, Patents*, YOUTUBE (Dec. 11, 2013), <https://www.youtube.com/watch?v=OYxmQShZ2Hw> [<https://perma.cc/TL38-M9YM>] (touting the eighty thousand patents held by Mercedes Benz as demonstrating the company's leadership in automotive innovation); see also Daniel June, "80,000 Patents" the Advertised Selling Point of Mercedes-Benz E-Class, JDJOURNAL (Mar. 20, 2012), <http://www.jdjournals.com/2012/03/20/80000-patents-is-advertised-as-mercedes-benz-e-class-selling-point/> [<https://perma.cc/EWS5-2VBZ>] (describing this the Mercedes marketing campaign).

103. Cf. Michael Madison, *Notes on a Geography of Knowledge*, 77 FORDHAM L. REV. 2039, 2048 (2009) (arguing that intellectual property licenses bridge boundaries between knowledge domains).

aspirations of the licensor. Licensing the patent may provide simultaneously to different patent constituencies freedom to operate, a source of revenue, a cost of production, a hedge against competition, a commitment to future legal action, a conduit of technical expertise.¹⁰⁴ The licensed patent is also frequently a bargaining chip for collateral negotiation toward collaboration or the transfer of know-how related to the patent.¹⁰⁵ It may provide a securitized asset or commodity.¹⁰⁶ The patent in this context becomes a passage point between multiple disciplinary realms, aligning disparate networks of actors and resources toward a particular transaction.

And here it is that the interstices of the patent become essential. Some commentators have claimed that the patent can only function if its bounds are certain,¹⁰⁷ but this is only true—if indeed it is true at all¹⁰⁸—with respect to local knowledge within a given social world. We have seen that patent doctrine preserves multiple spaces in which patents remains silent, maintaining ambiguities that may be satisfied or imbued with meanings as needed at different points in the life of the document. The patent provides a natural point of mediation, which largely occurs in the interstices between the local meanings of the document's disclosure.

It is what is *not* said in the document that allows it to maintain different identities in different social worlds. Indeed, the silences in the patent may themselves be negotiated. To one community, silence may signify that which is known and so obvious that it need not be recapitulated; to another, it may signify that which is yet to be discovered. To one community, it may represent future opportunity; to another, it may represent familiar convention. Silence may offer a space to be filled by contractual specification or by standard business practice. While disclosures provide commonality, silence provides opportunity.

104. See Colleen Chien, *From Arms Race to Marketplace: The Complex Patent Ecosystem and Its Implications for the Patent System*, 62 HASTINGS L.J. 297, 320–26 (2010); Anne Kelley, *Practicing in the Patent Marketplace*, 78 U. CHI. L. REV. 115, 115–17 (2011).

105. See Burk, *supra* note 24, at 1021.

106. See Amy L. Landers, *Liquid Patents*, 84 DENV. U. L. REV. 199 (2006); Michael Risch, *Patent Portfolios as Securities*, 63 DUKE L.J. 89 (2013); see also Michael J. Burstein, *Patent Markets: A Framework for Evaluation*, 47 ARIZ. ST. L.J. 507 (2015) (questioning the development of securitized patent markets).

107. See, e.g., JAMES BESSEN & MICHAEL J. MEURER, PATENT FAILURE: HOW JUDGES, BUREAUCRATS, AND LAWYERS PUT INNOVATORS AT RISK 46 (2008) (arguing that patents routinely fail as property rights due to claim ambiguity); Golden, *supra* note 57, at 323 (stressing the importance of patent claim certainty); see also Janet Freilich, *The Uninformed Topography of Patent Scope*, 19 STAN. TECH. L. REV. 150, 162–63 (2015) (arguing that patent scope will be sub-optimal because it is set too early in the life of the patent).

108. See *supra* notes 14–15 and accompanying text.

CONCLUSION

“For a word to be spoken,” Ged answered slowly, “there must be silence. Before, and after.”¹⁰⁹

My argument here is in some sense a variation on the familiar realist question of law in action versus law in the books.¹¹⁰ The common trope on the books regarding patents is that they are about disclosure, but uncritically accepting the conventional wisdom may blind us to what patents are about in practice. I suggest that such myopia misses not the forest for the trees, but the ground for the figure. Far from constituting a defect in patent disclosure, discursive silences may be a critical feature to their function. If patents are to act as boundary objects, silence is as important as articulation. Both disclosure and non-disclosure have a role to play, in which case we may do better to ask not simply where more disclosure might be called for, but where there should be less; not only where clarity is desirable, but where there is virtue to vagueness.

What I have proposed is also ultimately an empirical project. What we know of patent practice, and what we can discern from patent structure, suggests the suitability of patents as boundary objects. But that function can only be verified by field work to determine how the communities around the patent actually interact and whether they in fact use patents in the fashion that I have suggested. This is work of a sort that, even amid the current spate of empirical patent research, remains all too rare.

In the interim we should perhaps be cautious about calls to expand or revise the patent’s intended audience in a quixotic (and probably futile) quest to resolve every omission in the text of a patent. My argument may also call into question proposals to more rigidly fix the temporal resolution of the patent document.¹¹¹ Standards that are applied in different patent doctrines take as their point of assessment different moments in the history of the document; one commentator has suggested that this multiplicity of standards is confusing and that a single reference point should be chosen for all of the various requirements.¹¹² But patterns of overlap and lacunae between the patent’s doctrinal reference points also provide interpretive spaces,

109. LE GUIN, *supra* note 1, at 185.

110. See Jean-Louis Halperin, *Law in Books and Law in Action: The Problem of Legal Change*, 64 ME. L. REV. 45 (2011) (tracing the origins of the distinction).

111. See Lemley, *supra* note 48.

112. See *id.*

and while simplicity has its virtues, rigidity may instead disable patents from serving as passage points to foster innovation.