

Equivalency and Patent Law’s Possession Paradox

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I. INTRODUCTION

Possession is a central concept for property law.¹ Often ownership of an item is determined by who possessed it first, assessed by whatever metric is used to decide who wins this possession race. The seminal case of *Pierson v. Post* demonstrates this idea: is the hunter who merely chases a fox in “possession” of the animal, or is it the hunter who ultimately kills the it?² According to Carol Rose, “possession” is a clear act or statement that helps ensure notice to the world of the assertion of property.³ The act is in essence a form of communication that must be understood by the appropriate audience.⁴ These declaratory acts provide notice as to ownership, reducing the uncertainty of the ownership of the property.

There are times, however, when an interest in certainty gives way to considerations of fairness.⁵ For example, a hunter who traps or mortally wounds an animal is the owner, even if someone else discovers the trapped or wounded animal. Although the hunter did not have *actual* possession, the law views him as the owner: he has *constructive* possession of the animal, a legal fiction created to effect fairness. We see a similar dynamic with the doctrine that land owners possess constructively fugitive resources such as wild animals, oil, natural gas, and water, so long as the resource is on the owner’s property. If it runs or flows away, it is no longer the owner’s property. The owner likely never had actual possession of the resource, but we consider the owner to have possession constructively to determine who owns the property.

¹ See generally Carol M. Rose, *Possession as the Origin of Property*, 52 U. CHI. L. REV. 73 (1985).

² As anyone who has taken Property knows, it is the latter. 3 Cai. R. 175 (N.Y. Sup. Ct. 1805).

³ Rose, *supra* note 1, at 78.

⁴ *Id.* at 78-79.

⁵ See generally Carol M. Rose, *Crystals and Mud in Property Law*, 40 Stan. L. Rev. 577, 577-78 (1988).

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Constructive possession undermines certainty to some extent. For example, someone encountering a wounded animal may not know whether the wound was “mortal” if it has yet to succumb to the injury. Of course, if the wound is clearly mortal or the animal is trapped, the finder has *negative* notice -- the animal is not his but someone else -- but the finder likely has no idea who the actual owner is. Nevertheless, these constructive possession doctrines serve other, policy-driven purposes, such as fairness or preventing incidents of trespass.⁶ The legal fiction is created to effect other social or policy concerns, even at the expense of certainty.

The idea of possession, both actual and constructive, also plays an integral role in patent law, although in a slightly different form. The scope of a patent is inextricably tied to what the inventor created, or what the inventor possessed. One should only get protection under the patent for what the person actually invented. For example, if I discover a vaccine for cervical cancer, I am not entitled to a patent on vaccines for *all* forms of cancer. I invent those other forms and thus did not possess them. Thus, as in other forms of property, possession is a crucial aspect of determining the party entitled to the right to exclude afforded by a patent.

In patent law, however, we do not assess what the inventor created by looking at the physical object that is the subject of the patent right, in contrast to copyright law, for example. The right to exclude in copyright law is determined by comparing the actual work to the accused

⁶ In this way, constructive possession acts in a manner akin to proximate cause in tort law, where a party is not liable for all the harm of an act unless the consequences were foreseeable, even if the act was the cause-in-fact of the harm. The difference between the two is from whose perspective we are looking. For proximate cause, we ask what is foreseeable to the tortfeasor. For possession purposes, it is the perspective of the property holder. In the patent context, this distinction is crucial: in assessing the extent of a patent’s right to exclude, it is from the perspective of the patent holder – not the accused infringer – that is determinative. Thus, these ideas of possession, not proximate cause, are more appropriate and illuminating.

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infringing work.⁷ Patent law on the other hand requires the inventor to explain in her patent application what the invention is and how to make and use it; the act of communicating possession is part of the requisite *quid pro quo* for obtaining a patent.⁸ It is through the patent document that the inventor communicates to the public what her invention is. Accordingly, the key act for invention is not the physical creation of the invention but instead the mental state of having the entire idea of the invention.⁹ Indeed, an inventor can obtain a patent even if she never built a physical embodiment of the invention.¹⁰ Possession is thus demonstrated through the patent's specification, the part of the patent that requires the applicant to explain the details of her invention so as to guarantee that others can make and use the invention at its expiry.¹¹ This disclosure informs the appropriate scope of the patent.

Moreover, patent law affords “constructive possession” of certain creations to a patent owner under the doctrine of equivalents. A patent may cover a device that is not within the literal scope of the claims but is nevertheless deemed “close enough” to be covered. The express purpose of this doctrine is to ensure fair and adequate protection to the patentee as to not undermine the patent incentive.¹² In this way, the doctrine is akin to the constructive possession

⁷ See generally Jeanne C. Fromer, *Claiming Intellectual Property*, 76 U. CHI. L. REV. --- (forthcoming 2009) (comparing claiming structures in patent and copyright law), draft available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1273449. In patent law, comparing the device accused of infringing with the patentee's commercial version of the invention is legal error. See, e.g., *ACS Hosp. Systems, Inc. v. Montefiore Hosp.*, 732 F.2d 1572, 1578 (Fed. Cir. 1984) (“Infringement is determined on the basis of the claims, not on the basis of a comparison with the patentee's commercial embodiment of the claimed invention.”).

⁸ 35 U.S.C. § 112, ¶ 1.

⁹ *Pfaff v. Wells Elecs.*, 525 U.S. 55, 60-61 (1998).

¹⁰ *Id.*; *The Telephone Cases*, 126 U.S. 1 (1888).

¹¹ See generally Timothy R. Holbrook, *Possession in Patent Law*, 59 SMU L. REV. 123 (2006) [hereinafter Holbrook, *Possession*].

¹² *Graver Tank & Mfg. Co. v. Linde Air Products Co.*, 339 U.S. 605, 607 (1950) (“[T]o 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.... It would deprive him of the

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ideas: even though the patentee did not *actually* possess the device at issue, for policy reasons we consider her to possess the invention nevertheless.

Beyond this superficial comparison, the doctrine of equivalents departs significantly from our ideas of constructive possession in other areas of property law. The doctrine of equivalents, in its current form, grants protection to patent holders for creations that by definition were not – and indeed *could not* have been – in their possession at the time of the patent applications. In fact, the courts have made it clear that the doctrine effectively only has play in this context, where an after-arising technology alters the significance of the limits found in the patent’s claims.¹³ Under the current state of the law, in fact, the inventor is given *more* protection for things that she could not have created than for those that should have been within her grasp.¹⁴ By way of comparison, it would be as if a hunter is entitled not to the fox he mortally wounded but instead to a fox someone else is hunting next week. The idea of constructive possession in

benefit of his invention and would foster concealment rather than disclosure of inventions, which is one of the primary purposes of the patent system.”); *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 731 (2002) (“If patents were always interpreted by their literal terms, their value would be greatly diminished. Unimportant and insubstantial substitutes for certain elements could defeat the patent, and its value to inventors could be destroyed by simple acts of copying.”).

¹³ See *infra* notes 49-94 and accompanying text. Cf. Mark A. Lemley, *The Changing Meaning of Patent Claim Terms*, 104 MICH. L. REV. 101, 120 (2005) (“Indeed, covering equivalent technology not contemplated when the patent claims were written is one of the major benefits of the doctrine of equivalents.”) [hereinafter Lemley, *Changing Meaning*].

¹⁴ One could question whether affording protection under the doctrine of equivalents for something that the inventor did not create could violate the Patent Clause of the Constitution, which permits Congress to grant to “Inventors the exclusive Right to their respective ... Discoveries.” U.S. CONST. ART. 1, § 8, CL.8. The constitutional argument would be that the exclusive rights have been untethered from the inventor’s discovery, thus violating the clause. I personally do not believe there would be a violation. There is no doubt that the inventor created something, and the doctrine of equivalents involves the extent of the protection the government affords. The question would be the extent to which there must be a nexus between what is invented and the rights we give to protect that invention. It is not clear that the Constitution would require some sort of one-to-one connection. Thanks for Professor Eric Goldman for bringing this argument to my attention.

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patent law seems to be stretching well beyond its logical limits and disrupts the idea of the *quid pro quo* between disclosure and patent scope.

Thus arises a troubling paradox – the patent holder is given control over something that by definition she did not possess at the time of her application.¹⁵ She can exclude others from practicing a technology that she did not create. The patent holder can therefore control improvements and advances not objectively in her possession. The patent system is arguably providing a windfall – “sure, you didn’t invent this, nor could you have...but we will give you protection any way!” Such scope of exclusion has serious implications for a system of innovation. It has the potential to allow the patent holder to block or control downstream innovations even though it is beyond what she invented or disclosed.¹⁶ While some patent theorists would view this result as a favorable one,¹⁷ there is reason to believe that such protection is unwarranted because it prevents spillovers and other positive externalities.¹⁸

Minimally, there should be some normative or theoretical account for why the courts should provide protection to patent holders for something they did not create. Unfortunately, the courts and commentators have offered a number of explanations for the doctrine of equivalents,

¹⁵ I will refer generally to what the inventor possessed. This use of terms is somewhat inexact, as what I mean is that the invention would not have been within the possession of the patent law’s hypothetical person, the person having ordinary skill in the art (PHOSITA). Given the awkwardness of this phrasing, I will, for ease, refer to what the inventor possessed, recognizing that “possession” is defined objectively.

¹⁶ Admittedly, this may be the *only* value for some inventions: there may not be a market for the invention itself but only once it is incorporated in downstream technology or further improved. Nevertheless, such a circumstance could suggest that patent protection was premature.

¹⁷ Edmund W. Kitch, *The Nature and Function of the Patent System*, 20 J.L. & Econ. 265, 266 (1977).

¹⁸ Brett M. Frischman and Mark A. Lemley, *Spillovers*, 107 COLUM. L. REV. 257 (2007); Mark A. Lemley, *Ex Ante Versus Ex Post Justifications for Intellectual Property*, 71 U. Chi. L. Rev. 129, 129 (2004) [hereinafter Lemley, Justifications]; Mark A. Lemley, *The Economics of Improvement in Intellectual Property Law*, 75 Tex. L. Rev. 989, 994-95 (1997) [hereinafter Lemley, Economics of Improvement].

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but few if any have recognized this paradox let alone tried to resolve it. This Article offers two potential reconciliations of the paradox. The narrower form is that protection for later-developed technologies is appropriate when the advance took place outside of either the inventor's field of technology or those fields for which the inventor should have been aware. This idea is based on a fairness principle: it is unreasonable to expect a technologist to be able to anticipate changes outside of her field that may create changes within her field. Protection in this context is therefore justifiable when the accused infringer has in essence appropriated the invention but has relied on technological advances outside of the inventor's field. In the broader version, instead of focusing on the issue of later-developed technology alone, I posit that the equivalency question should ask whether the patent's disclosure would have enabled the accused device at the time of infringement. Over time, as technology and knowledge improve, a person skilled in the art may be able to understand broader implications from the inventor's original discovery, implications not apparent at the time the inventor filed her patent application. In this way, the question in equivalency is tied to the inventor's contribution to the state of the art.

Part II of this Article explores the current methods of assessing the scope of a patent's right to exclude both under literal infringement. Part III explores the doctrine of equivalents and the various limits on equivalency, showing that patentees are awarded protection only for later-developed technologies that were not in their possession. Part III, explores the current theories justifying the doctrine of equivalents and finds them wanting in terms of justifying the paradox. In Part IV, I explore the two potential reconciliations of the possession paradox in a way that hopefully provides an appropriate balance and some guidance to issues of patent claim scope.

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II. DISCLOSURE, POSSESSION, AND LITERAL CLAIM SCOPE

A patent is granted to an inventor for creating a new and non-obvious, useful invention. The grant of a patent does not allow the inventor to control all possible variations of that invention. It is limited generally to the inventor's creation. For example, Samuel Morse's patent did not give him the right to exclude others from using "motive power of the electric or galvanic current, which I call electromagnetism, however developed for making or printing intelligible characters, signs or letters at any distances."¹⁹ The Supreme Court concluded that such a patent claim was "too broad" and "not warranted by law" because "he claims an exclusive right to use a manner and process which he has not described and indeed had not invented, and therefore could not describe when he obtained his patent."²⁰ Similarly, being the first person to create a vaccine for a particular retrovirus (one that infects chickens) did not afford the inventor coverage for all vaccines for retroviruses, which would have included a vaccine on the AIDS viruses.²¹ The scope of patent protection is tethered to the inventor's creation as disclosed in the patent document.

This assessment of scope is not contingent on the inventor's subjective belief, however; the scope of the exclusive rights are objectively determined by a review of the patent document and other relevant interpretive sources and tools, such as the history of the prosecution of the patent before the Patent and Trademark Office (PTO) and other canons of claim interpretation.²² Thus, although the applicant discloses what she believes is her invention in the patent, the actual

¹⁹ O'Reilly v. Morse, 56 U.S. 62, 112 (1854).

²⁰ *Id.* at 113.

²¹ *In re Wright*, 999 F.2d 1557, 1562-64 (Fed. Cir. 1993).

²² KIMBERLY A. MOORE, PAUL R. MICHEL, AND TIMOTHY R. HOLBROOK, PATENT LITIGATION AND STRATEGY 287-311; Timothy R. Holbrook, *Substantive versus Process-based Formalism in Claim Construction*, 9 LEWIS & CLARK L. REV. 123, 144-45 (2005) [hereinafter Holbrook, *Claim Construction*].

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scope of the patent rights are objectively determined.²³ It is the patent’s claims that define the scope of the patent’s right to exclude and provides the basis for assessing both validity and infringement.²⁴ The claims of a patent set forth the “metes and bounds” of the exclusive rights of the patent.²⁵ These limits are assessed objectively, from the viewpoint of patent law’s analog to the “reasonable person” of tort law – the person having ordinary skill in the art (PHOSITA).²⁶ The disclosure therefore not only impacts the validity of the patent claims but also constrains the scope that those claims are afforded.

Thus, even if the inventor views her contribution to the art as narrow, the PHOSITA may recognize that, in fact, the innovation represents a considerable advance in the art. At times, the inventor may be entitled to protection beyond what she individually invented, so long as that protection would have been apparent to the PHOSITA.²⁷ For example, the inventor could be a

²³ An inventor therefore may actually have invented *more than* she believes is her actual invention, if her disclosures would teach one of skill in the art how to make and use a variety of embodiments of her invention beyond what she herself thought up. *Cf.* Gentry Gallery, Inc. v. Berkline Corp., 134 F.3d 1473 (Fed. Cir. 1998) (recognizing enablement of broader claim but failure of written description because inventor did not contemplate broader form of invention). Moreover, a patentee may *underclaim* by inappropriately limiting the scope of her patent right to only particular variants of her creation when in fact she possessed a far broader conception. The objective assessment, however, does facilitate public notice: competitors can assess the scope of the patent using the various tools without having to inquire into the subjective thoughts and beliefs of the inventor. The inventor must therefore memorialize her invention within the patent document itself.

²⁴ Lemley, *supra* note 13, at 101.

²⁵ Mark A. Lemley and Phillip J. Weiser, *Should Liability Rules Govern Information?*, 85 Tex. L. Rev. 783 (2007).

²⁶ *Multiform Desiccants, Inc. v. Medzam, Ltd.*, 133 F.3d 1473, 1477 (Fed.Cir.1998) (“It is the person of ordinary skill in the field of the invention through whose eyes the claims are construed.”). *See generally* Rebecca S. Eisenberg, *Obvious to Whom? Evaluating Inventions from the Perspective of the PHOSITA*, 19 Berkeley Tech. L.J. 885 (2004).

²⁷ The justification is that a patent application should not be required to list every possible permutation of an invention, so long as the PHOSITA would be able to construct all of those variations. Recent developments in the written description requirement, however, has curtailed the validity of such claims. *See, e.g.*, *Gentry Gallery, Inc. v. Berkline Corp.*, 134 F.3d 1473, 1479-80 (Fed. Cir. 1998). I have argued elsewhere that this use of the written description

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fortunate fool – in his mind, his invention is fairly trivial but, objectively within the field, it is actually an incredible breakthrough.²⁸ The patent system would provide some fairly strong protection, so long as the patent document is drafted accordingly. Similarly, the inventor might believe his invention is the most amazing thing since the wheel, but in reality it is a nominal improvement. The scope of the right to exclude is anchored not to the inventor’s subjective belief but instead how the contribution is measured objectively within the field as assessed by the PHOSITA: if the PHOSITA would possess an embodiment of the invention, based on the patent’s disclosure, then it is appropriate to reward the inventor for that advance through patent protection, even if the inventor herself did not create that embodiment.²⁹ Thus, the concept of “possessing” the invention is an objective one.

Affording such protection is important to provide appropriate incentives to innovate and commercialize in the patent system. A patent affords its owner the right to exclude others from practicing the invention, allowing the patentee to recoup the sunk costs of developing the invention.³⁰ The patent can also provide incentives for others to invest in the patent holder’s

requirement is inappropriate, a position I will not repeat here. *See* Holbrook, *Possession*, *supra* note 11, at 161-63.

²⁸ The inventor would need an able patent attorney, however, to craft the application in a manner that would allow the broadest claim scope possible. *See* Michael J. Meurer & Craig Allen Nard, *Invention, Refinement and Patent Claim Scope: A New Perspective on the Doctrine of Equivalents*, 93 GEO. L.J. 1947, 1951-52 (2005) (“Some inventors do not claim everything they have enabled because they do not know or cannot (or did not) articulate everything they have enabled. Whether an inventor obtains the broadest permissible claim breadth depends mostly on the talent and effort of the inventor and prosecutor in identifying what has been enabled.”).

²⁹ Applicants are allowed to include prophetic examples in their application, which are predictions potential variations in their invention. If the technology is fairly predictable, then an inventor can easily extrapolate beyond the particular embodiment she actually created. *See* Sean B. Seymore, *Heightened Enablement in the Unpredictable Arts*, 56 UCLA L. REV. 127, 144-46 (2008) (discussing prophetic examples).

³⁰ *See* Holbrook, *Possession*, *supra* note 11, at 132-33; Mark A. Lemley, *Ex Ante Versus Ex Post Justifications for Intellectual Property*, 71 U. CHI. L. REV. 129, 129 (2004).

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business or in the commercialization of the invention.³¹ As a result, the breadth of protection afforded by a patent can be crucial to giving an appropriate incentive to innovate or commercialize. The broader the rights, the greater the ability of the patentee to exclude others and therefore the ability to profit from the invention.

The tailoring of the scope of patent protection by the patent's disclosure can occur in two, interrelated ways. At the extreme, if the disclosure within the patent document does not adequately support the scope of the relevant claim, then the claim is invalid. The primary disclosure doctrine is enablement, which requires an applicant to disclose her invention in enough detail so as to enable the PHOSITA to practice it without undue experimentation.³² If

³¹ See Holbrook, *Possession*, supra note 11, at 135-36; F. Scott Kieff, *Property Rights and Property Rules for Commercializing Inventions*, 85 MINN. L. REV. 697 (2001); Edmund W. Kitch, *The Nature and Function of the Patent System*, 20 J.L. & ECON. 265, 266 (1977).

³² The Federal Circuit has also elevated the written description requirement of 35 U.S.C. § 112, ¶ 1 as a separate grounds for testing the adequacy of disclosure. Traditionally, the use of the written description was used to police new matter from entering the patent, preventing patentees from updating the patent application to ensnare later technological advances for which protection under that application would be inappropriate. Now, however, the court uses the test even when there is no concern of new matter.

Originally the doctrine appeared to be limited to inventions relating to biotechnology and genetics, but the court has since expanded it to other areas. *LizardTech, Inc. v. Earth Resource Mapping, Inc.*, 424 F.3d 1336 (Fed. Cir. 2005); *Gentry Gallery, Inc. v. Berkline Corp.*, 134 F.3d 1473, 1479-80 (Fed. Cir. 1998). I and others, including Federal Circuit judges, have sharply criticized this doctrine. *Lizardtech, Inc. v. Earth Resource Mapping, Inc.*, 433 F.3d 1373, 1376-81 (Fed. Cir. 2006) (Rader, J., dissenting from declination of en banc reconsideration); Harris A. Pitlick, *The Mutation on the Description Requirement Gene*, 80 J. PAT. & TRADEMARK OFF. SOC'Y 209, 222 (1998); Mueller, *Evolving Application*, at 617; Harold C. Wegner, *When a Written Description Is Not a "Written Description": When Enzo Says It's Not*, 12 FED. CIR. B.J. 271, 274 (2002).

My view is that the best way to assess the "possession" of an invention is through the enablement standard, not written description. Holbrook, *Possession*, supra note 11, at 161-63. Recent Federal Circuit case law, however, is bringing enablement into line with the written description requirement, inappropriately in my view. See *Automotive Techs. Int'l, Inc. v. BMW of N. Am., Inc.*, 501 F.3d 1274, 1283 (Fed. Cir. 2007) ("Although the knowledge of one skilled in the art is indeed relevant, the novel aspect of an invention must be enabled in the patent.").

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the breadth of a claim is so broad that one could not readily practice it based on the patent's disclosure alone, the claim is invalid. The patentee cannot enforce that claim against anyone.

Disclosure operates in a subtler way in claim construction as well. If there are a variety of plausible interpretations of a claim, some of which would be enabling and others that would not be, the court should choose from those that would be enabling. This analysis is reflected in the canon of claim construction that courts should interpret patent claims to maintain their validity if reasonably possible to do so.³³ Such a link between disclosure and claim scope is appropriate – the patent claim should not cover more than what the inventor has contributed objectively to the technological field. The patent in such cases should be construed as limited to what the inventor objectively possessed as her invention.³⁴ In this way, the scope of the claim is closely linked to the extent of the patent's disclosure, limiting the patent to that which the inventor objectively possessed.

One could take this tailoring of claim scope with the inventor's possession one step further by requiring that the patent enable the *accused device* in order for there to be literal infringement. Thus, by reading the patent, one should have been able to make the accused

This debate is not central to the main premise of this article – that the doctrine of equivalents provides protection for that which by definition that the inventor did not objectively possess.³³ *Modine Mfg. Co. v. United States Int'l Trade Comm'n*, 75 F.3d 1545, 1557 (Fed. Cir. 1996); *see also* *Holbrook, Claim Construction*, *supra* note 22 at 144. *But see* *Phillips v. AWH Corp.*, 415 F.3d 1303, 1326 (Fed. Cir. 2005) (en banc) (“While we have acknowledged the maxim that claims should be construed to preserve their validity, we have not applied that principle broadly, and we have certainly not endorsed a regime in which validity analysis is a regular component of claim construction.”).

³⁴ *See* *Netword, LLC v. Centraal Corp.*, 242 F.3d 1347, 1352 (Fed.Cir.2001) (“Although the specification need not present every embodiment or permutation of the invention and the claims are not limited to the preferred embodiment of the invention, neither do the claims enlarge what is patented beyond what the inventor has described as the invention.”) *Cf.* *Acumed LLC v. Stryker Corp.*, 483 F.3d 800, 815 (Fed. Cir. 2007) (Moore, J., dissenting) (“Patent scope should be coextensive with what the inventor invented as evidenced by what is disclosed in the patent specification.”).

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device without undue experimentation.³⁵ This approach to literal infringement would truly link the extent of the patent's disclosure to the scope of the patent: if one could not practice the accused device based on the patent's teaching, then the patent would not be able to cover the accused device. By definition, the accused device was outside the possession of the inventor.

To be clear, this is *not* currently the state of the law. The focus of enablement law currently is the scope and validity of the claim. Infringement only involves the comparison of the accused device to the construed patent claim and does not further inquire as to the sufficiency of the disclosure vis-à-vis the accused device. The current law implicitly uses a transitive-type analysis: if the claim is enabled and covers the accused device, then the patent must enable the accused device.

In reality, it is quite possible for a patent to literally cover a device that the patentee did not enable. There may even be a patent covering the accused device, suggesting that there are significant differences between the two, but there still may be infringement. For example, assume that the original patent covers a method of making a drug Hypnophan, which helps induce a hypnotic state. The patent claims a method comprising steps A, B, C, and D.³⁶ A competitor subsequently discovers a catalyst for the reaction that improves the efficiency of Hypnophan produced in the process, so that he can get more Hypnophan using fewer initial chemicals. The competitor performs the same steps – A, B, C, and D, but also uses the catalyst.

³⁵ Robert P. Merges and Richard R. Nelson, *On the Complex Economics of Patent Scope*, 90 COLUM. L. REV. 839, 845 (1990) (“At first blush it might seem to make sense to limit the rights of a patentee to only those embodiments of the invention she has disclosed in her specification, i.e., those that she has actually created at the time the patent application is filed. But imitators would soon find some minor variation over the disclosed embodiments; with such an ultra-narrow enablement principle, they would then have a nonenablement defense if the patentee tried to enforce the patent. Such a rule would soon render patents useless.”).

³⁶ See generally *Atlas Powder Co. v. E.I. du Pont De Nemours & Co.*, 750 F.2d 1569, 1580 (Fed. Cir. 1984).

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The competitor even obtains a patent for the use of the catalyst in the method.³⁷ The original patent could not enable the use of the method with the catalyst at the time it was filed because no one at that time knew that the catalyst would have such an affect.³⁸ But, under current law, the competitor would still be literally infringing the patent because he is performing all of the claimed steps. The addition of the catalyst would not remove the accused infringer's activities from the literal scope of the original patent.

Patents in this situation – one covering the initial discovery and a subsequent one covering a significantly useful improvement – are known as blocking patents.³⁹ The original inventor cannot use the improved process without getting approval; similarly, the improver cannot even practice his invention – notwithstanding his improvement – without getting the approval of the original inventor. The solution to this problem is to cross-license the patents, allowing both parties to use the patented methods. A strict requirement that, to infringe, the patent must enable the accused device could eliminate the blocking patent problem because if the improvement is a non-obvious one, the original patent likely could not have enabled it.⁴⁰ In the Hypnophan hypothetical, the original patent could not enable the improvement because it did

³⁷ See 35 U.S.C. § 101 (permitting patents on improvements of inventions).

³⁸ It would seem that the use of the catalyst, even if it existed at the time the application was filed, would be unforeseeable. Recent Federal Circuit case law has suggested to the contrary by concluding that something cannot be equivalent if it existed at the time of the amendment, even if its equivalency was not contemporaneously known. *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 493 F.3d 1368, 1382(Fed. Cir. 2007) (“An equivalent is foreseeable if one skilled in the art would have known that the alternative existed in the field of art as defined by the original claim scope, even if the suitability of the alternative for the particular purposes defined by the amended claim scope were unknown.”).

³⁹ See Kevin Emerson Collins, *The Reach of Literal Claim Scope into After-Arising Technology: On the Construction of Things and Meanings*, -- CONN. L. REV. --- (forthcoming 2009); Merges and Nelson, *supra* note 35, at 860-62.

⁴⁰ See Holbrook, *Possession*, *supra* note 11, at 169-73 (discussing link between obviousness and enablement).

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not, and could not, disclose the catalyst. Thus a strict “possession” viewpoint would mitigate blocking patents.

While this approach does not actually reflect the law, a strand of doctrine does exist that comes quite close to implementing this view of patent scope. Patent law has a defense to literal patent infringement which states that “where a device is so far changed in principle from a patented article that it performs the same or a similar function in a substantially different way, but nevertheless falls within the literal words of the claim, the doctrine of equivalents may be used to restrict the claim and defeat the patentee's action for infringement.”⁴¹ This doctrine, known as the “reverse doctrine of equivalents,”⁴² notes that there are times that, even when the literal terms of a patent’s claim is met, there may be occasions when it is inappropriate to allow protection. The Federal Circuit has expressly tied this doctrine to the extent of the patent’s disclosure:

The reverse doctrine of equivalents is invoked when claims are written more broadly than the disclosure warrants. The purpose of restricting the scope of such claims is not only to avoid a holding of infringement when a court deems it appropriate, but often is to preserve the validity of claims with respect to their original intended scope.⁴³

⁴¹ *Graver Tank & Mfg. Co. v. Linde Air Prods. Co.*, 339 U.S. 605, 608-09 (1950); *see also* *Boyden Power-Brake Co. v. Westinghouse*, 170 U.S. 537, 568 (1898) (“The patentee may bring the defendant within the letter of his claims, but if the latter has so far changed the principle of the device that the claims of the patent, literally construed, have ceased to represent his actual invention, he is as little subject to be adjudged an infringer as one who has violated the letter of a statute has to be convicted, when he has done nothing in conflict with its spirit and intent.”).

⁴² *SRI Intern. v. Matsushita Elec. Corp. of America*, 775 F.2d 1107, 1123 (Fed. Cir. 1985).

⁴³ *Texas Instruments, Inc. v. U.S. Intern. Trade Com'n*, 846 F.2d 1369, 1372 (Fed. Cir. 1988). *See also* *Merges and Nelson*, *supra* note 35, at 911 (“The same point should be borne in mind when a claim covers embodiments that turn out to be well beyond the teaching of the patent's disclosure. This is the case of so-called reverse equivalents.”); Charles F. Pigott, Jr., *Equivalents in Reverse*, 48 J. Pat. Off. Soc’y 291, 292 (1966) (“[N]o matter how broad the claims may be when taken literally, and even though they may avoid the prior art when given the broadest interpretation, nevertheless the claims can cover only the particular embodiment the patentee has disclosed and equivalents thereof.”).

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The reverse doctrine of equivalents thus acts as a check on claim overbreadth—if the claim is broader than is warranted by the patent’s disclosures, then there is no infringement even if the claims would literally read on the accused device.⁴⁴ In this way, the scope of the patent was reigned in without necessarily invalidating the claim for not being enabled by the specification.

Regardless, claim construction doctrine clearly links the permissible literal scope of the patent to what the inventor objectively possessed as assessed by the disclosures in the specification. This approach is consistent with the view that the scope of protection afforded by the patent should be commensurate with her contribution to the state of the art; she should not be given a windfall.

Given the importance of claim scope, one would think that this area of patent law would be fairly settled and that assessing the scope of a patent’s right to exclude would be fairly routine. Nothing could be farther from the truth. On multiple levels, the courts struggle to assess the meaning of claim terms and consequent scope of the right to exclude. The construction of the literal meaning of a claim is rife with ambiguity, and reversal rates at the U.S. Court of

⁴⁴ Notwithstanding this seemingly appropriate use of the doctrine, the Federal Circuit has never affirmed a finding of non-infringement under the reverse doctrine and indeed has questioned its continued viability. *Tate Access Floors, Inc. v. Interface Architectural Resources, Inc.*, 279 F.3d 1357, 1368 (Fed. Cir. 2002) (“Not once has this court affirmed a decision finding noninfringement based on the reverse doctrine of equivalents....Even were this court likely ever to affirm a defense to literal infringement based on the reverse doctrine of equivalents, the presence of one anachronistic exception, long mentioned but rarely applied, is hardly reason to create another.”); *Scripps Clinic & Research Found. v. Genentech, Inc.*, 927 F.2d 1565, 1581 (Fed. Cir. 1991) (remanding to district court for consideration of non-infringement under the reverse doctrine of equivalents). The Federal Circuit recently considered a defense based on the reverse doctrine of equivalents and again rejected it. *See Roche Palo Alto LLC v. Apotex, Inc.*, 531 F.3d 1372, 1377-79 (Fed. Cir. 2008).

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Appeals for the Federal Circuit, the court with exclusive appellate jurisdiction over all cases arises under the U.S. patent laws, run at around forty percent.⁴⁵

As if that state of affairs was not bad enough, patent law compounds that problem by affording protection not only for the literal scope of the patent claim but also for things that are “close enough” to be considered infringement. This “doctrine of equivalents” affords greater protection for the patentee beyond the scope of his actual claim language. Of course, determining whether something is an equivalent is a fact-intensive inquiry that is difficult, if not impossible, to assess *ex ante*.⁴⁶ The rationale for the doctrine historically has been rooted in fairness, in much the same way constructive possession has operated in property law. Although the inventor was not in possession of the particular variant of his creation, as measured by the disclosure in his patent, courts treated the inventor as if the accused device was covered by the patent because it was equivalent.

III. EQUIVALENTS, LATER-DEVELOPED TECHNOLOGIES, AND THE POSSESSION PARADOX

Literal claim scope and the idea of “possession” are intimately interconnected.

Seemingly, if one is to be rewarded by a patent for her invention, then scope under the doctrine

⁴⁵ See Christian A. Chu, Empirical Analysis of the Federal Circuit’s Claim Construction Trends, 16 BERKELEY TECH. L.J. 1075, 1104 (2001); Kimberly A. Moore, Markman Eight Years Later: Is Claim Construction More Predictable?, 9 LEWIS & CLARK L. REV. 231, 239 (2005); Kimberly A. Moore, Are District Court Judges Equipped to Resolve Patent Cases?, 15 HARV. J.L. & TECH. 1, 11 (2001); David L. Schwartz, *Practice Makes Perfect? An Empirical Study of Claim Construction Reversal Rates in Patent Cases*, 107 MICH. L. REV. 223, 240 (2008).

⁴⁶ As the Supreme Court less-than-helpfully noted:

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. It does not require complete identity for every purpose and in every respect. In determining equivalents, things equal to the same thing may not be equal to each other and, by the same token, things for most purposes different may sometimes be equivalents.

Graver Tank & Mfg. Co. v. Linde Air Products Co., 339 U.S. 605, 609 (1950).

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of equivalents should similarly be connected. If one considers the role of “constructive possession” in property law, a comparison can be drawn. Wild animals become property not only when they are taken into possession but also when they are trapped or mortally wounded.⁴⁷ Although the hunter did not take actual possession, the law considers her to have done “enough” to consider the animal her property. Constructive possession in these contexts effect policies of fairness that somewhat mitigate the harsh consequences of a pure actual possession rule. Nevertheless, the property right is still tied to the “thing” – the hunted animal.

This comparison of constructive possession breaks down under the doctrine of equivalents. Bizarrely, the Federal Circuit generally has *precluded* access to the doctrine of equivalents if the asserted equivalent is one that should have been in the inventor’s possession during the application process. In other words, you get *more* protection for something you did not and could have had possessed. It isn’t like the fox ,where you effectively did possess the thing. Here, the “thing” was by definition beyond the inventors grasp. This phenomenon can be seen through the court’s preference for affording protection for later-developed technologies and by the legal limitations on the doctrine of equivalents, which essentially preclude equivalency if the patentee should have been able to claim the asserted equivalent.⁴⁸

A. *Equivalency and “Later-Developed Technology”*

⁴⁷ *Pierson v. Post*, 3 Cai. R. 175 (N.Y. Sup. Ct. 1805).

⁴⁸ See Anthony H. Azure, Note, *Festo's Effect on After-Arising Technology and the Doctrine Of Equivalents*, 76 WASH. L. REV. 1153, 1163 (2001); Christopher A. Cotropia, “*After-Arising Technologies and Tailoring Patent Scope*,” N.Y.U. ANN. SURVEY OF AM. L. 151, 151-52 (2005). This was not always the state of the law, as protection for later-developed technologies is a more recent development, see Merges and Nelson, *supra* note 35, at 855 (“The early cases were split, but the prevailing view now is that new technology can be equivalent.”), although one that has now subsumed all equivalency.

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Patent law does not limit patent scope to the literal terms of the claim. The default rule for patent scope is that a patent covers not only what is literally delineated in the claims but also equivalents to each of those elements. Specifically, in infringement, if a limitation of the claim is not literally present in the device accused of infringing, there may yet be infringement if that component is considered equivalent to what is claimed.⁴⁹ In essence, if the accused device is “close enough,” in a lay sense, to be considered effectively as the same thing as the claimed invention, then there is still infringement.

The determination of whether something is equivalent, however, is generally a messy, fact-intensive endeavor.⁵⁰ Courts have used a variety of factors, noting that equivalency is not a “prisoner to formula.”⁵¹ One test courts have used is the tripartite “function-way-result” test: to be equivalent, the element of the accused device must perform substantially the same function in substantially the same way to yield substantially the same result.⁵² Courts have elsewhere articulated that the key analysis is whether the element in the accused device is insubstantially different from what is claimed.⁵³ Finally, courts have concluded that the known

⁴⁹ *Cybor Corp. v. FAS Techs.*, 138 F.3d 1448, 1459 (Fed. Cir. 1998) (en banc) (“An accused device that does not literally infringe a claim may still infringe under the doctrine of equivalents if each limitation of the claim is met in the accused device either literally or equivalently.”).

⁵⁰ Confirming the difficulty of this inquiry, the Supreme Court offered this rather unhelpful elucidation of equivalency: “In determining equivalents, things equal to the same thing may not be equal to each other and, by the same token, things for most purposes different may sometimes be equivalents.” *Graver Tank & Mfg. Co. v. Linde Air Products Co.*, 339 U.S. 605, 609 (1950).

⁵¹ *Id.*

⁵² *Id.* at 608; *cf.* *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 40 (1997) (“An analysis of the role played by each element in the context of the specific patent claim will thus inform the inquiry as to whether a substitute element matches the function, way, and result of the claimed element, or whether the substitute element plays a role substantially different from the claimed element.”).

⁵³ *Lighting World, Inc. v. Birchwood Lighting, Inc.*, 382 F.3d 1354, 1357 (Fed. Cir. 2004). *But see Warner-Jenkinson*, 520 U.S. at 40 (“[T]he insubstantial differences test offers little additional guidance as to what might render any given difference ‘insubstantial.’”)

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interchangeability of the relevant element with the feature in the claim also supports a finding of equivalency.⁵⁴

The Supreme Court also made clear that the determination of whether there is infringement under the doctrine of equivalents is to be made at the time of infringement. Thus, in determining whether the accused device contains an equivalent element under the above tests, it is permissible to consider advances in technology that may have occurred between the time the inventor filed the relevant patent application and the time of infringement.⁵⁵ What may be viewed as an equivalent later in time may not have been an equivalent when the patent was filed because technology may not have been as evolved at the time of the application.

This temporal shift has played into the Federal Circuit's analysis of equivalency by noting that the doctrine is available to cover later-developed technology. Shortly after its creation, the court noted that "[t]he doctrine of equivalents is designed to protect inventors from unscrupulous copyists and unanticipated equivalents,"⁵⁶ suggesting a focus on later-developed technologies. Similarly, in *Pennwalt Corp. v. Durand-Wayland, Inc.*, the Federal Circuit noted in finding no equivalency that "the facts here do not involve later-developed computer technology which should be deemed within the scope of the claims to avoid the pirating of an invention."⁵⁷ Implicitly, then, if the case *did* involve later-developed technology, the case for equivalency would have been *stronger*.

⁵⁴ See *Graver Tank*, 339 U.S. at 609 ("An important factor is whether persons reasonably skilled in the art would have known of the interchangeability of an ingredient not contained in the patent with one that was.")

⁵⁵ *Warner-Jenkinson*, 520 U.S. at 37 ("the proper time for evaluating equivalency-and thus knowledge of interchangeability between elements-is at the time of infringement, not at the time the patent was issued.")

⁵⁶ *Kinzenbaw v. Deere & Co.*, 741 F.2d 383, 389 (Fed.Cir.1984).

⁵⁷ *Pennwalt Corp. v. Durand-Wayland, Inc.*, 833 F.2d 931, 938 (Fed. Cir. 1987) (in banc).

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Subsequent Federal Circuit panels have drawn on the language in *Warner-Jenkinson* to support the proposition that the application of the doctrine of equivalents is most appropriate when the accused device incorporates later-developed technology.⁵⁸ For example, the court noted in *Sage Products, Inc. v. Devon Industries, Inc.* that application of the doctrine was inappropriate because “[n]o subtlety of language or complexity of the technology, nor any subsequent change in the state of the art, such as later-developed technology, obfuscated the significance of this limitation at the time of its incorporation into the claim.”⁵⁹ More particularly the court noted that, “as between the patentee who had a clear opportunity to negotiate broader claims but did not do so, and the public at large, it is the patentee who must bear the cost of its failure to seek protection for this foreseeable alteration of its claimed structure.”⁶⁰ The court is saying if the asserted equivalent was foreseeable, then the patentee *should* have claimed it and will be unable to use the doctrine to capture that variation. Thus, if the applicant should have been in possession of that embodiment, it generally will be precluded from asserting equivalency over it. Necessarily, if the accused device represents an advance in technology, then the applicant could not have claimed it and thus should be afforded protection under the doctrine of equivalents. Application of this reasoning appears in *Hughes Aircraft Co. v. United States*, where the court noted that “[t]his is a case in which a ‘subsequent change in the state of the art, such as later-developed technology, obfuscated the significance of [the] limitation at the time of its incorporation into the claim.’”⁶¹

⁵⁸ See *Hughes Aircraft Co. v. United States*, 140 F.3d 1470, 1475 (Fed. Cir. 1998) (citing *Warner-Jenkinson*’s conclusion on timing of the equivalency analysis to support view that the doctrine of equivalents affords protection for later-developed technologies).

⁵⁹ *Sage Products, Inc. v. Devon Industries, Inc.*, 126 F.3d 1420, 1425 (Fed. Cir. 1997).

⁶⁰ *Id.*

⁶¹ *Hughes Aircraft Co. v. United States*, 140 F.3d 1470, 1475 (Fed. Cir. 1998) (quoting *Sage Prods.*, 126 F.3d at 1425).

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The requirement for later-developed technology is poignantly apparent in the application of the doctrine of equivalents to limitations drafted in means-plus-function form pursuant to 35 U.S.C. § 112, ¶ 6. Under § 112, ¶ 6, the applicant may write a claim limitation in terms of the function to be performed, but the limitation will be construed as covering the structure disclosed in the specification that performs that function and the equivalents to that structure.⁶²

“Equivalents” under this provision, however, represents the *literal* scope of the claim.⁶³ As a result, the patentee is still entitled to the application of the doctrine of equivalents as to this limitation.⁶⁴ Needless to say, this “equivalent to an equivalent” has caused confusion and consternation, even at the Federal Circuit.⁶⁵

The Federal Circuit has recognized that equivalency under § 112 and the doctrine of equivalents are related.⁶⁶ Although § 112, ¶ 6 requires the *identical* function be performed – not substantially the same⁶⁷ – the analysis of general insubstantial differences between the way the claimed and accused devices operate is common to both forms of equivalency.⁶⁸

Due to the relatedness of the two forms of equivalency, the Federal Circuit has concluded that “a finding that the element in the accused device is not an equivalent under § 112, ¶ 6 usually

⁶² 35 U.S.C. § 112, ¶ 6.

⁶³ *Pennwalt Corp. v. Durand-Wayland, Inc.*, 833 F.2d 931, 934 (Fed. Cir. 1987) (in banc).

⁶⁴ *See, e.g., WMS Gaming, Inc. v. Int’l Game Tech.*, 184 F.3d 1339, 1353 (Fed. Cir. 1999).

⁶⁵ *Dawn Equip.* (three “additional views,” particularly Judge Plager’s).

⁶⁶ *Chiuminatta Concrete Concepts, Inc. v. Cardinal Industries, Inc.*, 145 F.3d 1303, 1310 (Fed. Cir. 1998).

⁶⁷ *Id.*; *WMS Gaming*, 184 F.3d at 1353 (“However, we have reversed the district court’s holding of literal infringement based on a lack of identity of function. Consequently, unlike *Chiuminatta*, the accused device in this case may still infringe under the doctrine of equivalents.”).

⁶⁸ *Chiuminatta*, 145 F.3d at 1310.

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precludes a finding of infringement under the doctrine of equivalents.”⁶⁹ The rationale for this preclusion is that

a finding of non-equivalence for § 112, ¶ 6, purposes should preclude a contrary finding under the doctrine of equivalents. This is because . . . the structure of the accused device differs substantially from the disclosed structure, and given the prior knowledge of the technology asserted to be equivalent, it could readily have been disclosed in the patent. There is no policy-based reason why a patentee should get two bites at the apple. If he or she could have included in the patent what is now alleged to be equivalent, and did not, leading to a conclusion that an accused device lacks an equivalent to the disclosed structure, why should the issue of equivalence have to be litigated a second time?⁷⁰

Access to the doctrine of equivalents generally is precluded because the patent applicant could have claimed the asserted equivalent and, thus, was in possession of the invention. If at the time of the application, the inventor possessed a variant of the invention, she is precluded from using the doctrine of equivalents from covering that embodiment.

One exception to this general rule of preclusion, however, is the case of later-developed technology. Equivalency under § 112, ¶ 6, as a form of literal infringement, is assessed at the time the patent issues.⁷¹ In contrast, equivalency under the doctrine of equivalents is determined at the time of infringement, accommodating later-developed technology.⁷² Thus, the doctrine of equivalents generally will apply to a means-plus-function limitation if the element in the accused

⁶⁹ *Id.*; see also *Nomos Corp. v. Brainlab USA, Inc.*, 357 F.3d 1364, 1369 (Fed. Cir. 2004) (“The technology . . . predates the ’026 patent and, therefore, does not qualify as after-developed. Consequently, the finding of no literal infringement in this case is dispositive as to infringement under the doctrine of equivalents as well.”).

⁷⁰ *Chiuminatta*, 145 F.3d. at 1311.

⁷¹ *Al-Site Corp. v. VSI Intern., Inc.*, 174 F.3d 1308, 1320 (Fed. Cir. 1999) (“[A]n equivalent structure or act under § 112 for literal infringement must have been available at the time of patent issuance.”).

⁷² *Warner-Jenkinson*, 520 U.S. at 37.

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device is the result of a technological advance, so long as the test for equivalency is still satisfied.⁷³ As the Federal Circuit explained:

There is an important difference, however, between the doctrine of equivalents and § 112, ¶ 6. The doctrine of equivalents is necessary because one cannot predict the future. Due to technological advances, a variant of an invention may be developed after the patent is granted, and that variant may constitute so insubstantial a change from what is claimed in the patent that it should be held to be an infringement. Such a variant, based on after-developed technology, could not have been disclosed in the patent. Even if such an element is found not to be a § 112, ¶ 6, equivalent because it is not equivalent to the structure disclosed in the patent, this analysis should not foreclose it from being an equivalent under the doctrine of equivalents.⁷⁴

The patentee is therefore entitled to protection for something that, by definition, she could not have claimed. As the court later elaborated, “[p]atent policy supports application of the doctrine of equivalents to a claim element expressed in means-plus-function form in the case of ‘after-arising’ technology because a patent draftsman has no way to anticipate and account for later developed substitutes for a claim element. Therefore, the doctrine of equivalents appropriately allows marginally broader coverage than § 112, ¶ 6.”⁷⁵

The possession paradox can be readily seen in this line of reasoning. The doctrine of equivalents applies primarily for later-developed technology that the patentee could not have claimed in her patent application. The patent protects the principle of the invention, in essence, and not what the inventor created. Yet, the court’s reasoning fails to explain why a patentee should be *entitled* to such protection: why should a patentee get protection for something that by definition, she did not—and could not—claim?

⁷³ *Al-Site*, 174 F.3d at 1320 (“An ‘after-arising’ technology could thus infringe under the doctrine of equivalents without infringing literally as a § 112, ¶ 6 equivalent.”).

⁷⁴ *Chiuminatta*, 145 F.3d at 1310.

⁷⁵ *Al-Site*, 174 F.3d at 1320 n.2.

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B. No Equivalency When Patentee Should Have Possessed the Asserted Equivalent

The preference for applying the doctrine of equivalents over devices that by definition the inventor did not possess is confirmed by the legal limitations placed on the doctrine.

Specifically, the doctrines of prosecution history estoppel, public dedication, and “specification estoppel” preclude the application of the doctrine of equivalents *unless* the asserted equivalent was unforeseeable. One Federal Circuit decision has gone so far as to say that “foreseeability” should be *the* limit on the doctrine of equivalents, supplanting the various alternative doctrines that currently are in place. Essentially these limitations preclude the doctrine of equivalents if the patentee was or should have been in possession of the equivalent at the time of the application. Failure to claim the equivalent precludes the doctrine of equivalents. These doctrines can be viewed, in essence, as various forms of evidence that ultimately prove the same concern. The following section explores these doctrines and their implications in detail.

1. Prior Art Preclusion

The clearest example such limits on the doctrine of equivalents is the prior art preclusion rule, which precludes the doctrine of equivalents from covering devices that were already in the prior art. The rationale for this limit is straightforward: the patent holder cannot use the doctrine of equivalents to obtain coverage over something for which she could not have obtained literal protection.⁷⁶ Thus, if the public (and necessarily the applicant) was in possession of the accused device already, then it cannot be considered an equivalent as a matter of law. The rationale of this doctrine provides the root for many of the later limitations – that if the patentee could not have claimed the accused device literally during the application process, then she cannot obtain

⁷⁶ *Wilson Sporting Goods Co. v. David Geoffrey & Associates*, 904 F.2d 677, 683-86 (Fed. Cir. 1990).

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coverage under the doctrine of equivalents. Later rules have evolved from this baseline, including circumstances where the patentee will be precluded from asserting equivalents not only over things she *could not claim* as a result of the prior art but also over things she *should have claimed, but failed to do so*.

2. *Public Dedication Rule*

The “possession paradox” of the doctrine of equivalents also can be seen in the Public Dedication Rule, which precludes a patentee from asserting equivalency over an embodiment of the invention that is disclosed in the patent's specification but is not claimed.⁷⁷ The justification for the doctrine is that the patentee could have claimed the embodiment but did not do so. The doctrine of equivalents should not be used to cover such a lapse in claim drafting. In other words, if the inventor was in possession of a particular version of the invention, or if the PHOSITA would understand it from the patent, but failed to claim it, that variation falls into the public domain.⁷⁸ Possession by the inventor is central to the dedication rule.

This rule, however, demonstrates the paradox: if the asserted equivalent was not disclosed (and thus not in the possession of the invention), then equivalency is available. The rule fails to provide an normative explanation for why equivalency should be available for embodiments of the invention that were outside the possession of the patent holder.

⁷⁷ *Johnson & Johnston Assoc. Inc. v. R.E. Service Co.*, 285 F.3d 1046, 1054 (Fed. Cir. 2002) (en banc).

⁷⁸ The Federal Circuit has addressed the issue of how sufficient the disclosure must be to trigger the rule. *See Toro Co. v. White Consolidated Industries, Inc.*, 383 F.3d 1326, 1334 (Fed. Cir. 2004) (rejecting enablement as standard for sufficiency of disclosure); *PSC Computer Prods., Inc. v. Foxconn Int'l, Inc.*, 355 F.3d 1353, 1360 (Fed. Cir. 2004) (noting the public dedication rule “does not mean that any generic reference in a written specification necessarily dedicates all members of that particular genus to the public. The disclosure must be of such specificity that one of ordinary skill in the art could identify the subject matter that had been disclosed and not claimed.”). *But see Holbrook, Possession*, supra note 11, at 167 (arguing for enablement-based standard for public dedication rule).

3. Prosecution History Estoppel

Another limitation on the doctrine of equivalents is prosecution history estoppel, which precludes infringement under the doctrine if the patent holder surrendered the relevant equivalent over the course of the application process at the PTO. Such surrender of the claim scope can occur when the applicant amends a claim that, before the amendment, literally covered the asserted equivalent but, after the amendment, does not. Surrender can also occur if the applicant makes arguments that evince a clear surrender of that subject matter. Prosecution history estoppel, when examined through the lens of possession, is more appropriately viewed as dealing with assessing whether the patentee possessed the relevant equivalent during the prosecution of the patent.

The Supreme Court has created a rebuttable presumption of prosecution history estoppel; if an applicant makes a narrowing amendment for reasons related to the patentability of the invention, the applicant presumptively has surrendered all equivalents as to that amended limitation. Because the presumption is rebuttable, a patentee can still assert equivalency if the amendment bore only a tangential relationship to the asserted equivalent, if the asserted equivalent was not foreseeable to one of ordinary skill in the art at the time the applicant made the amendment, or if it would be inappropriate to limit the patentee to the literal scope of her claim.

The "foreseeability" rebuttal, when properly considered, is essentially an issue of possession. The foreseeability inquiry asks whether the PHOSITA would have recognized that the asserted equivalent was available at the time of the amendment. The test is essentially whether the patentee should have been able to draft a claim that literally covered the asserted equivalent device. In order to claim the equivalent literally, it must have necessarily been within the grasp of the PHOSITA. In other words, if the PHOSITA possessed the invention at the time

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the amendment was made, then the patentee is foreclosed from asserting equivalency. Thus, just as was the case with the public dedication rule, the foreseeability standard is truly about assessing whether the inventor was in possession of the asserted equivalent but failed to claim it.

The Federal Circuit has made foreseeability an even more stringent standard, rendering rebuttal of the *Festo* presumption effectively impossible unless the asserted equivalent is solely the result of later-developed technology. In yet another decision in the *Festo* saga, the Federal Circuit concluded that an asserted equivalent is foreseeable “if it is disclosed in the pertinent prior art in the field of the invention. In other words, an alternative is foreseeable if it is known in the field of the invention as reflected in the claim scope before amendment.”⁷⁹ The variant is foreseeable even if one of ordinary skill in the art would not recognize that it was an equivalent at the time the application is filed.⁸⁰ So long as the variant existed at the time of the application, even if the PHOSITA would *not* view it as acceptable for use in the invention, then it is foreseeability, and prosecution history estoppel will preclude equivalency. Now, the patent drafter is required to buck conventional knowledge when filing an application or amendment to anticipate such a use of an existing yet unappreciated technology. The only way under this standard for an invention to be unforeseeable is if the technology is developed subsequent to the patent application.

While this reasoning is completely consistent with the court’s view that the doctrine of equivalents should *only* be available to combat after-arising technologies, the reasoning remains perplexing. If at the time of the application (or amendment), no one knows that a technology

⁷⁹ *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 493 F.3d 1368, 1379 (Fed. Cir. 2007).

⁸⁰ *Id.* at 1380 (rejecting application of function-way-result or insubstantial differences test to determine whether one skilled in art would have recognized equivalency); *id.* at 1383 (Newman, J., dissenting) (characterizing majority as holding “an existing structure need not be recognized, or even recognizable, as an equivalent at the time of the patent application or amendment, in order to be ‘foreseeable’ if it is later used as an equivalent.”).

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will function in an equivalent fashion, it seems counter to the reasoning of the Supreme Court's *Festo* decision to preclude equivalency. Yet, the Federal Circuit has said just that:

Prosecution history estoppel would apply only if the applicant in adopting the narrowing amendment was aware or should have been aware that the equivalent would be an equivalent to the claimed feature for purposes of the invention as defined by the amended claim. This in itself would be rare, and it would be rarer still that the applicant, aware of such an alternative, would have failed to claim it in the first instance. An alternative would be foreseeable only in the limited circumstances where the alternative was inadvertently omitted and was a candidate for a reissue patent.⁸¹

This reasoning is at odds with the justifications for both prosecution history estoppel and particularly the foreseeability rebuttal. Moreover, the court sweeps away the potential temporal dynamic at play with equivalency. As Judge Newman persuasively argued in dissent, a use of an extant technology may not be fully appreciated until a later date.⁸² The court would preclude equivalency in this context. Specifically, the court reasoned:

Third, since the only difference between the function/way/result test for infringement and *Festo's* test for prosecution history estoppel is the difference in timing—the function/way/result test for infringement being applied at the time of infringement and the function/way/result test for prosecution history estoppel being applied at the time of amendment—*Festo's* proposed test would lead to endless bickering over whether the equivalent satisfied the function/way/result test.⁸³

The timing of the inquiry, however, can often be *everything* in the analysis of both literal infringement and infringement under the doctrine of equivalents.⁸⁴ One of the key issues before the Supreme Court in *Warner-Jenkinson* was the issue of at what point in time should equivalency be determined, at the time of the application or at the time of infringement. The Court chose the latter.⁸⁵ The Federal Circuit, in a sweeping generalization, has ignored the utter

⁸¹ *Id.* at 1380-81.

⁸² *Id.* at 1383 (Newman, J., dissenting).

⁸³ *Id.* at 1381.

⁸⁴ Mark Lemley, *Changing Meaning*, *supra* note 13, at 103-04.

⁸⁵ *Warner-Jenkinson*, 520 U.S. at 37.

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importance of the temporal dimension of equivalency in light of pragmatic complications, none of which seem any more terribly complex than other issues of patent infringement and validity.

In its current incarnation, the presumption of prosecution history estoppel can only be rebutted if the relevant equivalent was developed after the filing date, thereby further confining the availability of the doctrine of equivalents to later-developed technology. If the public was in possession of the equivalent – even if it did not recognize the equivalency at the time of the application – prosecution history estoppel cannot be rebutted and equivalency is precluded.

The “tangential relationship” test is a bit more curious with respect to possession.⁸⁶ Seemingly, the inventor may have been in possession of the asserted equivalent. Instead, the Court’s focus appeared to be on the intent of the applicant in making the relevant amendment: if the amendment only bears little to no relationship to the asserted equivalent, the surrender of subject matter cannot be considered volitional. The patent applicant cannot be said to have given up that equivalent in these circumstances. For example, the amendment and the asserted equivalent may relate to different aspects of the invention.⁸⁷ The tangential relationship test, therefore, seems to suggest that the given equivalent was not in the inventor’s possession in the sense that she did not contemplate that she had given up coverage relating to the asserted

⁸⁶ One Federal Circuit judge views the tangential relationship as an inappropriate basis for rebutting the presumption of prosecution history estoppel and favoring the foreseeability rebuttal. *See Cross Medical Products, Inc. v. Medtronic Sofamor Danek, Inc.*, 480 F.3d 1335, 1347 (Fed. Cir. 2007) (Rader, J., concurring) (“Further, if the case permitted, any patentee would invoke the primary ‘foreseeability’ rebuttal factor. Thus, an invocation of ‘tangentiality’ often admits that the equivalent was both within the scope of the surrender and foreseeable at the time of prosecution. In other words, the patent drafter could have claimed the surrendered and foreseeable technology, but declined to do so.”). Tellingly, as of this writing, no patentee has been successful in rebutting the *Festo* presumption at the Federal Circuit on the basis of unforeseeability, while a few have been successful using the tangential relationship test, *see Regents of University of Cal. v. Dakocytomation Cal., Inc.*, 517 F.3d 1364, 1378 (Fed. Cir. 2008); *Primos, Inc. v. Hunter's Specialties, Inc.*, 451 F.3d 841, 849 (Fed. Cir. 2006); *Insituform Techs., Inc. v. CAT Contracting, Inc.*, 385 F.3d 1360, 1370-71 (Fed. Cir. 2004).

⁸⁷ *See Biagro W. Sales, Inc. v. Grow More, Inc.*, 423 F.3d 1296, 1306 (Fed.Cir.2005).

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equivalent. It does provide one avenue, however, through which the paradox may not necessarily arise.

4. “Specification Estoppel”

A patentee can also lose the ability to assert equivalency if she has surrendered the relevant subject matter in the specification itself.⁸⁸ If an applicant disparages some aspect of the prior art, she cannot use the doctrine of equivalents to recapture that surrendered subject matter. This surrender operates in an estoppel-like fashion, although without the constraints found within prosecution history estoppel, such as requirements that the surrender be due to an argument or amendment made for reasons related to patentability.⁸⁹ This doctrine appears to be the corollary to the cases that have limited the literal scope of patent claims by importing limitations from the specification into the claim itself; if the courts import such limits into the claim, generally infringement under the doctrine of equivalents is precluded on the same basis: the patentee surrendered the subject matter in the specification and cannot use the doctrine of equivalents to recapture it.

The court has articulated one exception to this rule: if the asserted equivalent is unforeseeable, then equivalency will not be precluded. This apparent exception has been articulated in one case, *Abraxis Bioscience, Inc. v. Mayne Pharma (USA) Inc.*⁹⁰ In this case, the

⁸⁸ *Vehicular Technologies Corp. v. Titan Wheel Intern., Inc.*, 141 F.3d 1084, 1090-92 (Fed. Cir. 1998); *Vehicular Technologies Corp. v. Titan Wheel Intern., Inc.*, 212 F.3d 1377 (Fed. Cir. 2000) (reversing grant of PI and affirming grant of summary judgment of non-infringement, respectively, because accused device failed to perform back-up function found in specification but not claims); *SciMed Life Systems, Inc. v. Advanced Cardiovascular Systems, Inc.*, 242 F.3d 1337, 1345-46 (Fed. Cir. 2001) (precluding equivalency as a result of disclaimers made in specification).

⁸⁹ See Holbrook, *Claim Construction*, *supra* note 22, at 139-144 (discussing evolution of doctrine and problems with its application, particularly in contrast to prosecution history estoppel).

⁹⁰ 467 F.3d 1370 (Fed. Cir. 2006)

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court limited the literal scope of the claims to exclude structural homologs of the claimed chemical as a result of the disclosures made in the specification alone. There was no discussion of the prosecution history in the construction of the claims. Accordingly, there was no literal infringement; the court determined that there was infringement under the doctrine of equivalents, however, because the accused compound's structure was unforeseeable at the time.⁹¹ Although there is discussion of the prosecution history, the argument for surrender used in the construction of the claim came exclusively from the specification. The unforeseeability of the accused device, therefore, served as an exception to language of surrender contained in the *specification*, demonstrating that the concept of unforeseeability will also come into play in these cases of specification estoppel.

The possession paradox is therefore confirmed through this limitation on the doctrine of equivalents as well. Language of surrender in the specification will be used to limit the doctrine of equivalents under the theory that the patentee could have claimed such embodiments, but instead surrendered them implicitly through the language disavowing claim scope. This disavowal can be countered, however, if the equivalent was unforeseeable, or outside the possession of the inventor. In this context, the courts will afford protection under the doctrine of equivalents for something that by definition the inventor did not and could not possess.

5. *Unforeseeability as "the" Limit on Equivalency*

The court, perhaps unintentionally, has limited the doctrine of equivalency almost exclusively to after-arising technologies. One Federal Circuit judge, Judge Rader, has taken the next step, espousing the view that foreseeability should be *the* singular limit on the doctrine of equivalents in lieu of the hodgepodge of limits previously discussed. He expressly articulated

⁹¹ *Id.* at 1381-82.

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this view in his concurrence in *Johnson & Johnston*, the en banc case that confirmed the bright-line public dedication rule. Specifically, Judge Rader advocated the following rule: “the doctrine of equivalents does not capture subject matter that the patent drafter reasonably could have foreseen during the application process and included in the claims.”⁹² Judge Rader reasoned that:

A foreseeability bar thus places a premium on claim drafting and enhances the notice function of claims. To restate, if one of ordinary skill in the relevant art would reasonably anticipate ways to evade the literal claim language, the patent applicant has an obligation to cast its claims to provide notice of that coverage. In other words, the patentee has an obligation to draft claims that capture all reasonably foreseeable ways to practice the invention. The doctrine of equivalents would not rescue a claim drafter who does not provide such notice.⁹³

Thus, in Judge Rader’s view, if the PHOSITA was in possession of the variant at the time the application was filed, she should draft claims covering those variations. Only if the variant was unforeseeable – i.e. not in the PHOSITA’s possession – would the doctrine of equivalents be available. Judge Rader further advocated the primacy of foreseeability by denigrating the “tangential relationship” rebuttal of prosecution history estoppel in *Cross Medical Products, Inc. v. Medtronic Sofamor Danek, Inc.*:

In my view, the tangential rebuttal principle exacerbates the policy deficiencies of the doctrine of equivalents. Upon invoking tangentiality, the patentee has already admitted that the equivalent falls within the scope of surrendered subject matter. Further, if the case permitted, any patentee would invoke the primary “foreseeability” rebuttal factor. Thus, an invocation of “tangentiality” often admits that the equivalent was both within the scope of the surrender and foreseeable at the time of prosecution. In other words, the patent drafter could have claimed the surrendered and foreseeable technology, but declined to do so.⁹⁴

⁹² *Johnson & Johnston Associates Inc. v. R.E. Service Co., Inc.*, 285 F.3d 1046, 1056 (Fed. Cir. 2002) (en banc) (Rader, J., concurring).

⁹³ *Id.* at 1057.

⁹⁴ *Cross Med. Prods., Inc. v. Medtronic Sofamor Danek, Inc.*, 480 F.3d 1335, 1347 (Fed. Cir. 2007) (Rader, J., concurring).

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In Judge Rader's view, all of these limits on equivalency reduce to one question: was the equivalent foreseeable? If so, then the patentee could have claimed the equivalent literally and she should be precluded from doing so now. Judge Rader, therefore, would institutionalize the paradox. Only in circumstances of later-developed, unforeseeable technology would the doctrine of equivalents apply. Judge Rader relies upon notions of public notice and lowest cost avoiders to reach this conclusion: as between the public and the patentee, the patentee should bear the burden of her failure to adequately claim known embodiments. Judge Rader fails to offer a normative justification, however, for why patentees should be entitled to protection against these after-arising technologies that were by definition not within the inventor's possession at the time she filed her application.

B. The Paradox: Patent Covers What Inventor Did Not Possess

The Federal Circuit's focus on later-developed technology and foreseeability limits on the doctrine of equivalents results in a situation where the patentee receives protection for something that she did not invent, i.e. did not possess. This state of affairs is paradoxical to the underlying basis of the patent system, that patentees receive protection for their invention. It runs counter to the doctrines that tailor literal claim scope to the scope of the inventor's contribution to the art through the patent disclosure.⁹⁵

The court has also failed to consider the consequences of this state of the law on the incentives to innovate that the patent provides. Patent owners now have perverse incentives:

⁹⁵ *Cf.* Merges and Nelson, *supra* note 35, at 857 (“One should note that these decisions, while we discuss them here under equivalents doctrine, come into conflict with the enablement principles discussed earlier. If one adheres to the doctrine that limits claims to what is enabled by the disclosure, one would think that the doctrine of equivalents would distinguish between allegedly infringing devices that used ‘new technologies’ basically to get around the claims from those that used the technologies to do something significantly better. In some cases, this distinction does not seem to have been made.”).

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they are punished if they fail to claim that which they possessed at the time of the application, requiring greater upfront and perhaps unwarranted costs given the uncertainties of the prosecution process, patent litigation, and the ultimate value of the invention contained within the patent. In terms of the value of the patent, however, they may be granted a pure windfall by allowing control over advances in the field that the inventor did not possess. It would seem that this is not a powerful incentive to innovate; from the *ex ante* perspective these advances are, by definition, unforeseeable and unknowable.⁹⁶ This information gap results in the *ex ante* incentive being discounted considerably.⁹⁷ The patentee would know that she is entitled to protection for later advances, whatever they may be, however. Although she may not be able to foresee a *particular* later-developed version of her invention, she can anticipate that it is likely some change will occur to render her particular version of her creation obsolete. The patent could act like an insurance policy in that regard, protecting the central aspect of the invention while affording protection for minor deviations.⁹⁸ Yet, if protection is only for later-developed, unforeseeable equivalents, it is hard to place a value on this protection at the time the application is filed.

The protection for later-developed technologies would seem justifiable only under a prospect view of the patent system—that patents allow the inventor to coordinate further developments of the technology, and eventual commercialization of it, in a manner analogous to

⁹⁶ Cf. Shyam Balganes, *Foreseeability and the Copyright Incentive*, -- HARV. L. REV. --- (forthcoming 2009).

⁹⁷ Nard & Meurer, *supra* note 28, at 1955 (“Patent applicants would not refine their claims to cover these equivalents, and inventors’ incentives are not much affected by a minute probability of loss of effective patent protection.”).

⁹⁸ See Cotropia, *supra* note 48, at 174.

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the use of prospects to explore the mineral potential of real property.⁹⁹ But even prospect theory fails to explain the paradox – protection is *denied* to those things foreseeable to the inventor, i.e. those most closely related to the property right, and only afforded to those further way. This temporal discontinuity makes no sense even from the viewpoint of the prospect theory.¹⁰⁰

The Federal Circuit has yet to articulate a basis for reconciling this paradox. The following section explores various rationales and theories for the doctrine of equivalents to see if they can resolve the paradox. Ultimately, they do not.

IV. FAILURE OF CURRENT THEORIES TO RESOLVE THE PARADOX

Courts and commentators have offered a number of theories to justify the doctrine of equivalents. The three primary ones are the correction of claims after the patent has issued, efficiency grounds given the *ex ante* uncertainty during the patent prosecution process, and providing fairness to preserve the appropriate incentives under the patent system. The following

⁹⁹ See Kitch, *supra* note 17; see also, Merges and Nelson, *supra* note 35, at 871 (“Like an exclusive claim to the minerals that may be produced from a plot of land, Kitch emphasized that patents are granted after invention but before commercialization. According to Kitch, this has two advantages: (1) it allows ‘breathing room’ for the inventor to invest in development without fear that another firm will preempt her or steal her work; and (2) it allows the inventor to coordinate her activities with those of potential imitators to reduce inefficient duplication of inventive effort.” This amounts to granting rights over an unexplored pool, with the right-holder being permitted to charge for access to various parts of the pool.” (footnotes omitted)).

¹⁰⁰ I confess my disagreement with the prospect theory of patents. I agree with many of the criticisms of this theory offered by others. See generally, Mark A. Lemley, *Ex Ante versus Ex Post Justifications for Intellectual Property Law*, 71 U. CHI. L. REV. 129 (2004). Moreover, it seems that the prospecting function of patents is a *result* of the patent system and not a reason for its existence. As a result, there is a danger of allowing prospect-based views to overly influence patent law evolution. As a result of the patent system in certain contexts, prescriptive use of this viewpoint would create a feedback loop into the law that likely creates a bias to treating patents increasingly like real property. Such reflective dynamic can be seen in other areas of intellectual property, generally with the result being greater property-like protection for rights holders without a balancing of the interest of the public. See, e.g., James Gibson, *Risk Aversion and Rights Accretion in Intellectual Property Law*, 116 Yale L.J. 882 (2007).

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section considers each of these justifications and finds that, at present, all are unsatisfactory in resolving the possession paradox.

A. *Claim Correction*

One argument to support the use of the doctrine of equivalents is that it functions to correct errors in the claims made during the prosecution of the patent. The process before the patent office is an imperfect one, and it is difficult – if not impossible – for the applicant to get every detail correct at that time. The doctrine of equivalents therefore works like an insurance policy: even if the patent attorney did not draft everything perfectly, the doctrine can step in to protect the patentee by extending the right to exclude to equivalents. Thus the patent attorney need not get everything “right” the first time around.

This justification for the doctrine of equivalents is not terribly persuasive. To begin, there are administrative mechanisms that allow a patent holder to correct mistakes in the patent. If the mistake is a simple typographical error, with no impact on the scope of the patent, a patent holder can file for a certificate of correction. At a more substantive level, patentees can request reissuance of their patent if there is some error in the patent that was made without deceptive intent. Thus, if the patentee truly believes a mistake was made in the patent, she can go to the patent office to correct it through the reissuance proceedings. Indeed, if the patentee requests reissuance within two years after the patent issues, the patentee can expand the scope of her patent claims.¹⁰¹ Moreover, through the use of continuation applications, a patent applicant can

¹⁰¹ The ability to expand the scope of the claims is subject to two important limitations. The Patent Act affords intervening rights to third parties who may infringe the reissued patent but who were not infringing the originally issued patent. *See* 35 U.S.C. § 252, ¶ 2; *see generally* Timothy R. Holbrook, *Liability for the “Threat of a Sale”: Assessing Patent Infringement for Offering to Sell an Invention and Implications for the On-Sale Patentability Bar and Other Forms of Infringement*, 43 SANTA CLARA L. REV. 751, 768-70 (2003). Moreover, the courts

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keep her application “alive” over a long period of time; while it costs her patent term,¹⁰² it does allow her to craft claims at a later date than can cover later advancements, so long as there is adequate support in the specification.

Aside from the lack of persuasiveness of this justification generally, this basis for equivalency fails to reconcile the paradox. The doctrine is in fact completely *wrong* if the purpose is to correct errors in claim drafting. Any error would arise from a failure to claim existing advancements, not later developments; yet protection is only afforded for these later developments. Even a perfect patent attorney could not craft a patent claim that could cover a later-developed technology because she would not be able to enable that technology. Any claim that did cover the later-developed technology literally would need to be construed narrowly to exclude such an unforeseen development or else it would be invalid as not being enabled. Consequently, the claim correction account of the doctrine of equivalents fails to provide a basis for affording protection to the patentee for something she did not possess.

B. Efficiency Grounds and Refinement Theory

have constrained the ability of a patent holder to expand the scope of her claims through reissuance by the recapture rule: if the patentee surrendered claim scope while originally pursuing patent protection at the PTO, she cannot use the reissuance proceeding to “recapture” that surrendered subject matter. *See, e.g., Medtronic, Inc. v. Guidant Corp.*, 465 F.3d 1360, 1372-73 (Fed. Cir. 2006) (“Under the ‘recapture’ rule, the deliberate surrender of a claim to certain subject matter during the original prosecution of the application for a patent ‘made in an effort to overcome a prior art rejection’ is not such ‘error’ as will allow the patentee to recapture that subject matter in a reissue.”). This doctrine acts in many ways like the doctrine of prosecution history estoppel. The key difference, however, is that the application of prosecution history estoppel results in a finding of non-infringement whereas the application of the recapture rule results in the invalidation of the relevant claim, *id.* at 1373.

¹⁰² The term of a patent presently is twenty years from the date the application for patent is filed. 35 U.S.C. § 154(b). If the applicant uses various procedural techniques at the patent office to delay issuance, the term will be reduced accordingly. If the process takes seven years, the term of the patent will only be thirteen years.

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Commentators have also grounded the doctrine of equivalents on a basis related to, but importantly different, from the claim correction rationale. This related explanation recognizes that it is difficult to draft claims *ex ante* that adequately capture the inventor's creation. But instead of being worried about subsequent claim correction, this account of the doctrine notes that it would be costly and inefficient to force *all* patent applicants to expend the resources to try to draft "perfect" claims. Given that the vast majority of patents are never litigated, it makes no sense to require large up-front expenditures for each and every patent applicant. The doctrine of equivalents, therefore, is efficient because it channels issues of claim scope to the courts only in the cases that matter, the ones that are litigated. Although there is a lack of certainty around these patents, the doctrine of equivalents is efficient because it avoids the wasteful use of resources early in the application process on patents that are valueless.

Again, like claim correction, this view of the doctrine fails to explain the protection afforded for after-arising technologies. Even without the doctrine of equivalents, patent applicants would be unable to capture unforeseeable developments. They would not know to draft the claim accordingly, and the patent disclosure would be insufficient to support a claim that would cover such a development.

Professors Michael Meurer and Craig Nard take a slightly different, efficiency-based view of the doctrine of equivalents. They reject what they dub the "fairness" and "friction" theories that justify the doctrine of equivalents and posit "refinement" model.¹⁰³ Nard and Meurer apply a game theoretic model with the inventor and a competitor serving as the players. The inventor has the option inventing and then further refining the scope of the patent; the competitor can react to the choices of the inventor. All of these choices depend on the costs and

¹⁰³ Meurer and Nard, *supra* note at 28, at 1986-94. *But see* Doug Lichtman, *Substitutes for the Doctrine of Equivalents: A Response to Meurer and Nard*, 93 GEO. L.J. 2013 (2005).

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benefits that attend each choice. In their view, the doctrine of equivalents operates positively when the costs of invention and refining the claim are both high; the cost of refinement or loss of monopoly profits from a competitor dampens innovation incentives absent the doctrine of equivalents in this context.¹⁰⁴ In other contexts, however, Meurer and Nard contend that the doctrine plays little role; instead, reliance on proper claim drafting and utilization of reissue proceedings can adequately protect inventors. Although they fall short of calling for the doctrine's abolition,¹⁰⁵ they do have a view of the doctrine that is inconsistent with the current state of the law.

This view of the doctrine of equivalents is problematic for a variety of reasons.¹⁰⁶ Most importantly, this view of the role of claim drafting vis-à-vis the doctrine assumes that the applicant *could* draft claims that would cover an equivalent, which means that it does not account for the role of later developed technology. Under their definition of refinement, they assume that the patent's specification enables both the set of embodiment literally and equivalently covered by the patent.¹⁰⁷ Even in a reissuance proceeding, a patentee must show sufficient support in the *original* disclosure to justify broader claim scope. Thus enablement must be satisfied as to those broader claims. Nard and Meurer expressly “reject the popular notion that the DOE is especially appropriate in the case of unforeseeable, later-developed technology because this justification focuses on the wrong question.”¹⁰⁸ Because the doctrine will not save refinements costs nor

¹⁰⁴ *Id.* at 1989.

¹⁰⁵ *Id.* at 1995 (“we think there is a socially valuable role for both reissues and the DOE); *cf. See, e.g.,* Joshua D. Sarnoff, *Abolishing the Doctrine of Equivalents and Claiming the Future After Festo*, 19 BERKELEY TECH. L.J. 1157 (2004).

¹⁰⁶ *See generally* Lichtman, *supra* note 103.

¹⁰⁷ Meurer and Nard, *supra* note 28, at 1983-84

¹⁰⁸ *Id.* at 1955.

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maintain the *ex ante* innovation incentive, they believe the courts are misguided in using the doctrine in this fashion.

Of course, the courts have effectively limited the doctrine for use *only* in this setting. Moreover, the authors do not explain their trust in prosecution history estoppel¹⁰⁹ yet their rejection of one of its key components: rebuttal by unforeseeable equivalents. Thus, by its proponents' own admission, their justification for the doctrine of equivalents is not descriptively accurate and prescriptively cannot resolve the paradox: it just eliminates it. In the eyes of the authors, therefore, later-developed technology, even if insubstantially different from that of the inventor, would fall outside the scope of the patent. This conclusion is unsurprising, however, given the authors' dismissal of fairness rationales for the doctrine. These rationales, however, retain traction, just as they do in property law's view of constructive possession. The following section examines the fairness principles.

C. Fairness to the Inventor

The primary justification for the doctrine of equivalents offered by the courts has been fairness: limiting a patent to its literal terms would allow competitors to easily circumvent the patent by making trivial changes to their device that avoid the literal language of the claim yet is, in essence, the same as the invention. This is particularly true given the ambiguities of language. A patent attorney is attempting to translate a physical construct into words that capture that “thing.”¹¹⁰ But words are inherently ambiguous. The Supreme Court elaborated this problem in *Festo*, where it noted

¹⁰⁹ Meurer and Nard, *supra* note 28, at 1988.

¹¹⁰ Nard and Meurer view fairness and language ambiguity as distinct concerns. I view them as the same. From the perspective of the patent attorney, language creates problems for capturing the invention in words. For competitors, language creates opportunities to evade the patent by

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the nature of language makes it impossible to capture the essence of a thing in a patent application. . . . The language in the patent claims may not capture every nuance of the invention or describe with complete precision the range of its novelty. If patents were always interpreted by their literal terms, their value would be greatly diminished. Unimportant and insubstantial substitutes for certain elements could defeat the patent, and its value to inventors could be destroyed by simple acts of copying. For this reason, the clearest rule of patent interpretation, literalism, may conserve judicial resources but is not necessarily the most efficient rule.¹¹¹

The fairness-based rationale provides a fairly solid normative basis for the doctrine of equivalents, but it does not provide an adequate explanation for the paradox. Indeed, the Supreme Court's view suggests that it believes competitors will game the system absent equivalency by tinkering around the fringes of the patent claim in some insignificant way. While that is definitely a ground for concern, it does not explain why such tinkering only becomes relevant in the context of unforeseen technology.

Moreover, this perspective of the doctrine divorces the patent disclosure from the right to exclude by affording protection for something that the inventor did not possess. Tinkering by later developed technology suggests that the competitor has improved upon the patentee's invention in a manner that might be significant, and perhaps patentably distinct. A fairness rationale does not explain why the patentee should be able to ensnare such an improvement within the scope of her patent. Of course, the change in technology could be exogenous to the relevant field of technology. In that situation, fairness may justify such protection.

In sum, the three primary justifications for the doctrine of equivalents fail to provide a persuasive basis for reconciling the current paradox of affording protection to the patent holder for something that she did not possess. As such, a more accurate normative account of the doctrine is necessary in order to explain the current state of the doctrine.

relying on those inherently ambiguous words. Thus, fairness for the patentee emerges as a response in both contexts due to the limits of language.

¹¹¹ *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 731-32 (2002).

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V. RESOLVING THE PARADOX – TYING EQUIVALENCY BACK TO THE DISCLOSURE

Neither the courts nor commentators have provided an adequate explanation for why the patentee is entitled to protection under the doctrine of equivalents for a device that she never invented. This section offers two potential bases for resolving the possession paradox. One approach is rooted in the fairness-based justification for the doctrine of equivalents: it is fair to afford such protection to the patentee when a change outside of the patentee's field affects that field, and her invention, in a way that allows others to capture the essence of the invention by making trivial changes. An inventor cannot be held to be able to foresee changes outside of her field, and the doctrine of equivalents should provide protection in those circumstances.

The second method would be to anchor the availability of the doctrine of equivalents to the scope of the patentee's disclosure in the following manner: if the patent disclosure enables the asserted equivalent *at the time of infringement*, then there can be infringement for the later-developed technology. This approach ties the availability of equivalents to the disclosure of the patent document but in essence allows those teachings to grow over time. While the obligations of § 112 are assessed at the time of the application for the relevant patent, this approach would instead embrace a hindsight reconstruction of the inventor's contribution to the art. If one reading the patent today would appreciate the trivial changes that could be made in light of current technology, then protection should be provided because the patentee has in essence given that invention to the public.

A. Later-Developed Technology Is Covered Only if the Development is From Outside the Inventor's Field

The present form of the doctrine of equivalents appears to provide a windfall to inventors, while denying them access to the doctrine when they possessed an equivalent variant of the invention when filing their application. This windfall is not supported by the fairness

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rationale except in one context: when the technological development that has altered the importance of the patent claim's limitations comes from outside of the inventor's technological field. Changes may occur in other scientific fields that have consequences and applications outside of that field. Chemists might be unaware of developments in robotics that may permit them to explore the potential efficacy of compounds at a more rapid rate. Computer scientists may be unaware of changes in semiconductor technology that may greatly enhance the functionality of computers. An inventor cannot, and should not, be held accountable for such changes. Thus, while even though they are foreseeable, an inventor should be protected under the doctrine of equivalents when technological advances extraneous to their field impact the scope of their patents.

The *Hughes Aircraft Co. v. United States* exemplifies this reconciliation of the paradox. In *Hughes*, the invention related to a method to control the pointing of geosynchronous satellites. His method required that ground controllers manually fire the jets to keep the satellite aligned. To do so, the controllers had to receive data from the satellite and run calculations on the ground in order to fire the jets at the appropriate time and for the appropriate length of time. All of this was done manually. At the time the inventor created the method and filed his application, computer technology had not developed to a state where it could be compartmentalized on a satellite. Later, however, computers emerge and allow remote control of the satellite, with calculations performed onboard without manual ground control.¹¹² The U.S. government's satellites used computer technology. The court concluded that, nevertheless, those satellites infringed the patent because the case was one in which "a 'subsequent change in the state of the

¹¹² See, e.g., *Hughes Aircraft Co. v. U.S.*, 140 F.3d 1470, 1475 (Fed. Cir. 1998) ("Thus, the synchronism in the accused device is coordinated by the computer instead of by real-time execution of the command from the ground.").

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art, such as later-developed technology, obfuscated the significance of [the] limitation at the time of its incorporation into the claim.”¹¹³ In this case, the later-developed technology came not from within the field of satellite control but instead from outside – computer technology – that created a sea change in the ability to control satellites. Equivalency in this context seems appropriate as a matter of fairness.

This approach fits seamlessly into the current doctrinal framework established by the Federal Circuit. On questions of foreseeability, for example, an equivalent would be unforeseeable if it was outside the inventor’s field. Similarly, this approach answers the tangential relation question and the other doctrines based on the idea that the patentee surrendered a given equivalent in the specification or during prosecution of the patent application: the inventor could not have contemplated such a surrender of such subject because that matter is outside of her field. We do not use information outside of his field of endeavor when determining if her invention is nonobvious; similarly, we will consider it difficult, if not impossible, for the inventor to have surrendered material outside of her field because she would not have that in mind. The other limits on the doctrine would remain untouched. The patentee of course cannot remove items from the public domain through the use of the doctrine of equivalents; she should also not be able to use the doctrine to cover embodiments disclosed in the specification but that she failed to claim—those embodiments clearly are within her field as she actually contemplated them.

Necessarily, determining whether the later-developed technology is in the same field requires some line drawing, which can be difficult. Patent law already has a doctrine to deal with a related issue. When assessing whether an invention claimed in the patent is obvious in

¹¹³ *Id.* (quoting *Sage Prods., Inc. v. Devon Indus., Inc.*, 126 F.3d 1420, 1425, 44 USPQ2d 1103, 1107 (Fed.Cir.1997)).

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light of information in the public domain – the prior art – a decision maker can only use evidence from “analogous arts.”¹¹⁴ A prior art reference, such as a previously issued patent or a previously published scientific article,¹¹⁵ is from an analogous art if it either comes from the same field of endeavor or, if it is not within inventor’s field, then if it “is reasonably pertinent to the particular problem with which the inventor is involved.”¹¹⁶ Courts could use this doctrine to navigate the thorny question of whether the later-developed technology comes from within or without the inventor’s field. Of course, the analogous art test is retrospective – the decision maker looks back to the problem that the inventor solved to determine where the inventor would think to look. The application in this context would be prospective, but it creates an existing framework for making that assessment.

1. Impact on Inventor’s Incentives

In assessing whether this reconciliation is appropriate requires an analysis of the impact on incentives that this approach could have both on the patent holder and on those who lie downstream of the patent. To begin, this rule would preclude the patentee from tying up her field of technology with a patent that covers something she did not possess when she filed her application. The patentee would generally not receive protection for developments within the field and only for those outside of the field. The result thus create an incentive for the patent holder to continue to innovate and improve upon her invention because others also will have the opportunity to invent and patent improvements on the technology. Of course, this is also the incentive presently in place with the strict limitations created by the Federal Circuit. Thus, the incentive to continue to innovate would be in place. More over, the original incentive to

¹¹⁴ See *In re Clay*, 966 F.2d 656, 658-59 (Fed. Cir. 1992).

¹¹⁵ See 35 U.S.C. § 102.

¹¹⁶ *Clay*, 966 F.2d at 658-59.

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innovate – prior to the creation of the invention at issue – would be intact, buffered by the reduction in risk of some later-developed technology outside of the field would eliminate the value of the patent itself or render the invention obsolete.¹¹⁷

2. *Impact of Incentive of Others to Improve the Invention*

The doctrine of equivalents necessarily implicates the ability of others to improve upon the inventor's creation, which indeed is lauded under the patent system.¹¹⁸ By limiting the doctrine of equivalents to those later-developed technologies that occur outside of the technological art field of the relevant patent, those within the field would be able to improve upon the patented invention and, if they could escape the literal scope of the claims,¹¹⁹ could patent and operate free of the earlier patent. The incentive to design around and improve upon the patented invention would remain intact.

This reconciliation may provide some coherency and grounding to the doctrine, it does not answer the question of whether equivalency should be given broader application. Is it

¹¹⁷ See Cotropia, *supra* note 48, at 174 (“Extending a patent’s scope to include after-arising equivalents will maintain the patent’s effective life in the face of such developments.”). A variation of this approach would be to afford protection to alterations that do not involve the point of novelty of the invention, the reason why the invention is patentable. Under this formulation, the patentee is not protected against changes to the “key” aspects of her invention and only against changes to the periphery. The incentive to continue to innovate on the central aspects of the invention would be maintained. In essence, this approach would take us back to central claiming, at least with respect to the doctrine of equivalents. In a different context, I have expressed concerns about the idea of a “point of novelty,” see Timothy R. Holbrook, *Extraterritoriality in U.S. Patent Law*, 49 WM. & MARY L. REV. 2119, 2159-60 (2008). Identifying what *is* the point of novelty could be difficult. Most importantly, it would fail to protect patentees against changes exogenous to their field that impact their invention, even that which may be the core of their invention, as *Hughes Aircraft* demonstrates. For developments within their field, it would seem appropriate to place the burden on the patent applicant maintain vigilance on developments, even if those developments are directed to the core or the periphery.

¹¹⁸ See 35 U.S.C. § 101 (allowing patents on improvements); see also *State Industries, Inc. v. A.O. Smith Corp.*, 751 F.2d 1226, (Fed. Cir. 1985) (“One of the benefits of a patent system is its so-called “negative incentive” to “design around” a competitor's products, even when they are patented, thus bringing a steady flow of innovations to the marketplace.”).

¹¹⁹ See *supra* notes 36-39 and accompanying text.

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appropriate to grant protection to technologies that should be viewed as having been within the possession of the patent applicant. The disclosures within the patent itself become irrelevant in the main to the issue of equivalency.

B. Is the Accused Device Enabled by the Patent at the Time of Infringement?

While the first approach does resolve the paradox, on a certain level it is unsatisfying. It is fairly narrow and divorces the question of the scope of the patent's right to exclude from the actual disclosures made in the patent document. Another approach to resolving the paradox would be to tie the availability of the doctrine of equivalents to the patent's disclosure. This approach finds its origins in the link between literal patent scope, enablement, and the reverse doctrine of equivalents.¹²⁰

In the context of the doctrine of equivalents, the appropriate question would be whether the patent enables one of skill in the art to practice the asserted equivalent *at the time of the act of infringement*. Infringement under the doctrine of equivalents currently is assessed at the time of infringement, which permits consideration of developments in the relevant technology. The enablement analysis in the context of equivalency would therefore be temporally shifted; courts and the PTO assess enablement for validity purposes at the time of the application. Thus, because the later-developed technology would be viewed as in the inventor's possession *at the time of infringement*, then it is appropriate to afford such protection to the patent holder. This approach would encompass the reconciliation based on affording protection for advances outside of the inventor's field: if those changes have altered the state of the art within the inventor's field, then they would be taken into account through the temporal shift under this approach. In this way, the enablement-based approach is far broader than the field-restricted approach.

¹²⁰ See *supra* notes 35-44 and accompanying text.

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Exploring the impact of the disclosure contemporaneously with the act of infringement presents of a number of benefits. First, it embraces hindsight affects. One problem in determining whether a patent claim is enabled for validity purposes is that the decision maker must step back in time and put herself in the position of the PHOSITA at the time the inventor filed her patent application. Adopting such a perspective requires the decision maker to ignore present-day context and insights. Such hindsight bias is present in other areas of patent law, and the resulting bias is the source of much doctrinal¹²¹ and academic consternation.¹²² The benefit

¹²¹ See, e.g., *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1553 (Fed. Cir. 1983) (“To imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge, is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher.”). The hindsight issue is particularly salient in obviousness inquiry, where a decision maker must determine if the claimed invention would have been obvious “at the time of the invent.” 35 U.S.C. § 103. The courts have developed a number of doctrines to combat such perceived bias. See *id.* (secondary considerations of non-obviousness “can often serve as insurance against the insidious attraction of the siren hindsight when confronted with a difficult task of evaluating the prior art. Though the prior art evidence here pointed more in the direction of nonobviousness than obviousness, the objective evidence may tend . . . to reassure the decisionmaker.”); *In re Kahn*, 441 F.3d 977, 986 (Fed. Cir. 2007) (“The ‘motivation-suggestion-teaching’ requirement protects against the entry of hindsight into the obviousness analysis.”); *In re Kahn*, 977 F.2d 1443, 1447 (Fed. Cir. 1992) (“The combination of elements from non-analogous sources, in a manner that reconstructs the applicant’s invention only with the benefit of hindsight, is insufficient to present a prima facie case of obviousness.”) The Supreme Court has recognized that these efforts can, at times, go too far. See *KSR Int’l Co. v. Teleflex, Inc.*, 127 S.Ct. 1727, 1742-43 (2007) (“The Court of Appeals, finally, drew the wrong conclusion from the risk of courts and patent examiners falling prey to hindsight bias. . . . Rigid preventative rules that deny factfinders recourse to common sense, however, are neither necessary under our case law nor consistent with it.”). Hindsight bias issues also present themselves in the various, *ex post* assessments of foreseeability. See, e.g., *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 493 F.3d 1368, 1385 (Fed. Cir. 2007) (Newman, J., dissenting) (“[T]he panel majority rules that the aluminum alloy shield was retrospectively foreseeable at the time of the amendment because it later was used as an equivalent, although it was not known to be equivalent and would not have been deemed equivalent at the time of the amendment. Hindsight is not foreseeability.”).

Hindsight issues arise in claim construction and the enablement inquiry, but the courts have not addressed these problems. Gregory N. Mandel, *Patently Non-Obvious: Empirical Demonstration That The Hindsight Bias Renders Patent Decisions Irrational*, 67 OHIO ST. L.J.

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of this approach would be that it actually eliminates the need, in this context, to be concerned with hindsight. In the enablement context, hindsight issues can develop as a result of two factors: the level of “ordinary skill” in the art may have changed over time and knowledge of possible uses and applications of the patented invention may have evolved.¹²³ In other words, a person reading the patent *today* could see a host of possibilities and applications for the technology that would not have been apparent when the application was filed.¹²⁴ In the typical enablement inquiry, these subsequent developments create problems for the decision makers, particularly in litigation, because enablement is assessed at the time of the patent application. In order to make that determination, court or jury must step back in time and ignore the evolution of the technology, creating a bias *in favor* of patentability.¹²⁵

1391, 1442 (2006) [hereinafter Mandel, *Non-Obvious I*]; Dan L. Burk & Mark A. Lemley, *Is Patent Law Technology-Specific?*, 17 BERKELEY TECH. L.J. 1155, 1199, (2002) (noting that “hindsight bias risks infecting the PHOSITA analysis in enablement and claim scope” yet the courts have failed to articulate rules to counter the bias).

¹²² See, e.g., Joseph Scott Miller, *Remixing Obviousness*, 16 TEX. INTELL. PROP. L.J. 237 (2007); Mandel, *Non-Obvious II*: Experimental Study On The Hindsight Issue Before The Supreme Court in *KSR v. Teleflex*, 9 YALE J. L. & TECH. 1 (2007); Mandel, *Non-Obvious I*, *supra* note 121; Rebecca S. Eisenberg, *Obvious to Whom? Evaluating Inventions from the Perspective of PHOSITA*, 19 BERKELEY TECH. L.J. 885, 887 (2004) (“This concern about the corruption of judgments of nonobviousness by improper ‘hindsight’ is a strong theme in Federal Circuit opinions.”).

¹²³ Lemley, *Changing Meaning*, *supra* note 13, at 102 (“Both the knowledge of the PHOSITA in a particular field and the meaning of particular terms to that PHOSITA will frequently change over time.”); Mandel, *Non-Obvious I*, *supra* note 121, at 1442.

¹²⁴ Lemley, *Changing Meaning*, *supra* note 13, at 103 (“The meaning of technological terms is fluid. A term that means one thing to scientists at one time may mean something different later as understanding in the field increases.”).

¹²⁵ As Professor Mandel noted:

The impact of the hindsight bias will be greatest for technologies that are advancing the fastest. The greater the difference between the state of the art (and PHOSITA skill level) at the time of invention versus at the time obviousness is determined, the greater the influence of the bias. As technological progress is often fastest in the early stages of new technology development, the hindsight bias may be particularly influential in causing broad, early-stage patents to be

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Use of enablement to determine equivalency would take into account such subsequent developments. The relevant question would be whether, reading the patent at the time of infringement, would the patent have enabled the PHOSITA to make the accused device. If the answer is yes, then there is infringement under the doctrine of equivalents. This method would anchor the scope of the patent right to the scope of the disclosure in the patent document. Although the inventor may not have possessed that embodiment at the time she filed her application, she has put the public into possession of these subsequent developments by the disclosure within her patent.

This approach comports to some extent with the role of enablement in literal claim scope. As noted earlier, literal infringement is not assessed by determining if the patent enables the infringing device. The basis of comparison between the accused device and the patent is the claim. So, the link between enablement and the accused device is one step removed due to the presence of the claim: we ask does the patent disclosure enable the claim, and then does the claim read on the accused device. Effectively, then, one could say that, if the claim reads on the accused device, it enables it. That statement does go too far, however, given the peripheral nature of patent claims: generally, they cover elements of the accused device that are not listed in the patent. The limitations of the claim are the “must haves” for infringement; other, extra things do not remove the accused device from the scope of the claim.¹²⁶ As such, the patent disclosure may not enable certain aspects of the accused device that are not listed in the claim. For

improperly held to have been enabling. This effect is particularly troubling as it is exactly these types of patents that may cause the greatest limitations and inefficiencies for future technological advancements.

Id. at 1442-43.

¹²⁶ There are exceptions to this rule, such as when the patent claim uses the transitions “consisting of” or “consisting essentially of,” but the vast majority of patent claims do not rely upon this language.

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example, a claim for a method of washing a car that requires the step of wetting the car, soaping the car, and rinsing the car would be infringed by a car washing method that included the extra step of drying the car. Technically, the patent could not have enabled the *entire* accused process because it may not have disclosed the step of drying the car.

This problem of the peripheral nature of the claims is not present when determining infringement under the doctrine of equivalents. The doctrine is applied on a limitation-by-limitation basis.¹²⁷ The test is not whether the device overall is equivalent to the claimed invention but instead whether the accused device contains elements that are equivalent to the particular limitations in the claim. As such, asking whether the accused device is enabled by the patent disclosure *is* appropriate and possible in the equivalency context because the patent's specification will contain descriptions with respect to each claim limitation (or else the claim would be invalid). If, taking into account advances within the field, the patent's specification enables the asserted equivalent, then there should be infringement.

The enablement-based approach would seemingly swallow the equivalency inquiry. There would seem to be no need for the function-way-result, insubstantial differences, or known interchangeability tests. If the patent enables the asserted equivalent, it is hard to imagine how the changes would *not* satisfy these tests. While some of the limitations on the doctrine, such as prior art preclusion, prosecution history estoppel and public dedication, arguably could have some teeth, the others might fall by the wayside because, by definition, the inventor would not have been able to claim these later-developed advances that may yet be within the same field of endeavor. As such, doctrinally this approach would significantly alter the landscape.

¹²⁷ Warner-Jenkinson.

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1. *Impact on the Inventor's Incentives*

While this approach is stylistically simplistic and theoretically cogent, in fact it would rework the doctrine of equivalents considerably. For one, the paradox is resolved in an overinclusive way: necessarily enabled would be devices prior to the date of infringement, which would include those that were in the possession of the inventor at the time of the application. This approach would gradually shift the scope of patent protection over time, allowing it to grow as the patent grows. Over time, therefore, the patentee could ensnare more technology, likely including improvements on her technology that have emerged. The *ex ante* incentive to invent in the first instance would thus be enhanced because a putative inventor would know that she would be able to exercise control not only over her actual invention but also over these later-developed advances in her field. She would have the expectation of controlling advances over her technology, guaranteed by equivalency. In essence, the life expectancy of the patent would be extended as the value of the disclosure grew over time. The patent thus acts as an insurance policy against obsolescence.¹²⁸ At a minimum, the incentive to innovate will be enhanced on the margins, particularly in a field where innovation proceeds rapidly.¹²⁹

In some circumstances, this reward of protection may be appropriate, particularly for true breakthroughs.¹³⁰ The initial embodiments that an inventor could enable initially for a truly ground-breaking invention may be narrow. For example, the first to discover a vaccine for RNA viruses achieved something significant in that field. Although he did not discover a vaccine that applies to *all* RNA viruses, the significance of his invention may justify a greater reward to

¹²⁸ Cotropia, *supra* note 48, at 175.

¹²⁹ *Id.* at 194.

¹³⁰ Patent law historically afforded greater protection under the doctrine of equivalents for “pioneering” inventions. *See* Merges and Nelson, *supra* note 35, at 848.

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ensure that he is adequately rewarded for his contribution even though, at the time of his application, the embodiments he could enable were limited.¹³¹

Thus, tying equivalency to the disclosure, by allowing the disclosure to grow over time, would provide considerable power to the patentee to protect subsequent technological advances.¹³² This methodology would comport well with the prospect view of the patent system by affording the patent owner the ability to coordinate downstream improvements on her invention. Affording such broad protection to all inventions might create significant obstacles to downstream improvements. Such control may reduce the incentive to continue to improve and develop her invention because she will be able to control all downstream improvements.¹³³ Thus the enablement-based approach to equivalency provides far greater power to the patentee to control subsequent developments, which could create a chokehold on innovation.

2. *Impact on Incentive of Others to Improve the Invention*

Such coordination, however, necessarily means that third parties attempting to improve upon the invention would run afoul of the patent's right to exclude. Although notice may improve because of the elimination of the hindsight problem, third parties would more likely have to accept a license or risk infringement to improve upon the patentee's invention. The incentive to continue to innovate would be greatly diminished if the improver had to seek

¹³¹ Indeed, the Federal Circuit limited this inventor to a claim that covered the vaccine limited to a particular chicken-based virus – unless there is an enormous market for this vaccine against chickens, his reward seemed quite limited. *See In re Wright*, 999 F.2d 1557, 1562-64 (Fed. Cir. 1993).

¹³² *Cf. Lemley, Changing Meaning, supra* note 13, at 120 (“The protection provided by a patent may be hollow if it does not confer the ability to prevent logical applications of the principle of the invention to new and unforeseen circumstances.”).

¹³³ Meurer and Nard have recognized aspects of this moral hazard, dubbing it preemptive refinement. Meurer and Nard, *supra* note 28, at 1990-91. *Cf. Merges and Nelson, supra* note 35, at 877 (“Yet we have little faith in the imagination and willingness of a “prospect” holder to develop that prospect as energetically or creatively as she would when engaged in competition. We are also skeptical about her ability to orchestrate development.”).

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approval from the patentee to engage in her enterprise. Under current law, if the improver is found to infringe – even if under the doctrine of equivalents – not only will she have to pay damages for past infringement but she will also be enjoined from future infringing activity. The robust form of the doctrine therefore could have severe consequences for those who wish to improve on the patented invention.

The enablement-based approach to the doctrine of equivalents provides significant theoretical symmetry to patent law by linking the scope of the patent to the patent's disclosure, even for purposes of determining equivalency. It does risk, however, greatly expanding the scope of the patent, at the potential expense of third parties. Thus, the extant limitations on the doctrine of equivalents would need to be enforced.

C. Denying Permanent Injunctions to Mitigate the Negative Consequences of the Doctrine of Equivalents

Even with those limitations in place, however, criticism of the doctrine has been profound. Both the fear of affording too much protection and the lack of notice to third parties undergird much of the criticism of the doctrine of equivalents. The above proposals, particularly the second, enablement-based perspective could create even greater problems in terms of overprotection, although hopefully, by embracing hindsight, notice problems may not be as extensive as under the status quo. Regardless, assessing the literal scope of a patent is rife with uncertainty.¹³⁴ The use of the doctrine of equivalents to expand patent scope merely compounds this uncertainty, creating considerably high transaction costs for third parties in assessing the scope of the patentee's right to exclude.

In light of this uncertainty, and the potential for this proposal to greatly expand the scope of patents under the doctrine of equivalents, it may be appropriate to reconsider the remedies

¹³⁴ See *supra* note 45.

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available against those who infringe by equivalence. The following proposal would apply not only to the reconciliations I have posited above but also could be used under the current regime to address those who fear that the doctrine reaps too much uncertainty.

The literature has failed to address why injunctive relief must be as readily available for infringement both literal infringement and infringement under the doctrine of equivalents. This need not be the case. One way to balance the interest in rewarding an inventor and protecting the interests of third parties would be the use of a liability rule in lieu of a property rule when infringement is based on equivalents. The full panoply of remedies would be available for literal infringement, but one who infringes a patent under the doctrine of equivalents would not be subject to a permanent injunction. Lost profits and other damages would remain available for past infringement for infringement under either.

Others have recognized that the use of liability rules can be appropriate when transaction costs are high.¹³⁵ As Professors Lemley and Weiser recognized, the uncertain scope of patent rights creates high transaction costs, which may suggest the use of a liability rule in certain situations.¹³⁶ There is no doubt that assessing the scope of a patent is a difficult task, even for literal infringement.¹³⁷ The doctrine of equivalents compounds this uncertainty given that it is determined at the time of infringement based on the way the accused device functions.

Assessing *ex ante* whether such a device infringes is incredibly complex.

Another potential transaction cost that could arise is a bilateral monopoly. If a third-party improver wants to work within the field cover by the patent, she will have to get approval from the patent owner. There is no alternative; the absence of exit means that the improver must get

¹³⁵ Lemley and Weiser, *supra* note 25, at 786.

¹³⁶ *Id.* at 793 (noting transaction costs in IP regimes “has to do with the uncertain scope of many rights protected by property rules”).

¹³⁷ *See supra* note 45.

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the permission of the patent holder or abandon her endeavor altogether. The ability of the patent holder to hold the improver hostage in such a circumstance could result in inefficient bargaining and ultimately no license.

The use of a liability rule in lieu of a property rule for future infringement could mitigate the perceived negative impacts of the doctrine on third parties. Thus third parties may be more willing to engage in improving and designing around a patent if they know that they will not be precluded from practicing their improvement in the future. If the royalty is indeed reasonable, the infringer may also be able to continue to use their innovation profitably as well.¹³⁸ Patentees would also be compensated to some degree for the ongoing use of the insubstantially different variation, so they would not be left empty-handed. Thus, any impact on their *ex ante* incentive to innovate would be reduced: they will receive compensation to help offset their sunk costs, although they will not be able to block the use of the later-developed technology through an injunction.

There may be concerns over whether the courts are institutionally capable of administering such a system. Indeed, concerns over such competence has led many scholars to suggest that property rules are the most appropriate as they delegate the authority for control over the resource to the owner, who likely has the best information to assess the appropriate use of the property. While the appropriateness of this rule can be overstated, it remains the case that courts routinely are involved in assessing royalty rates and remedies in patent cases. This proposal is not advocating an industry-wide compulsory license system but instead one that

¹³⁸ *Panduit Corp. v. Stahl Bros. Fibre Works, Inc.*, 575 F.2d 1152, 1157-58 (6th Cir. 1978) (“A reasonable royalty is an amount ‘which a person, desiring to manufacture and sell a patented article, as a business proposition, would be willing to pay as a royalty and yet be able to make and sell the patented article, in the market, at a reasonable profit.’”) (quoting *Goodyear Tire and Rubber Co. v. Overman Cushion Tire Co.*, 95 F.2d 978, 984 (6th Cir. 1937)).

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would arise in the case-by-case context of patent infringement litigation. The Supreme Court has recognized this role for patent cases generally.¹³⁹

CONCLUSION

The doctrine of equivalents remains one of the most controversial areas in patent law. Its role in protecting more than the literal scope of the patent claims creates tension between certainty of claim scope and fairness to the inventor. If an inventor is granted the exclusive right of a patent in exchange for his disclosure, and the scope of protection is commensurate with the scope of disclosure, then the Federal Circuit's current doctrine is simply wrong. By tying equivalency to the disclosure, as it changes over time in the eyes of the PHOSITA, this proposal creates an appropriate version of "constructive" possession: although the patentee was not in actual possession of the invention, she should be viewed as in possession of it because the technology has evolved yet her invention the key to her invention remains intact.

¹³⁹ *eBay Inc. v. MercExchange, L.L.C.*, 547 U.S. 388, 393-94 (2006) (rejecting bright-line rule in favor of permanent injunctions in patent cases). A more modest version of this proposal would make infringement under the doctrine of equivalents merely part of the four factor equitable inquiry detailed in *eBay*. Seemingly, infringement by equivalency, as opposed to literal infringement, could factor into the irreparable harm factor or the balance of hardships.