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Early Filing and Functional Claiming

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EARLY FILING AND FUNCTIONAL CLAIMING

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INTRODUCTION

When, exactly, does invention occur? That is the question at the heart of Mark Lemley's perceptive article, *Ready for Patenting*.[1] Patent law, Lemley shows, usually treats invention as occurring before the inventor has built a prototype or tested the new idea, systematically favoring those who quickly file a patent application over those who do the messy work of actual implementation.[2] Lemley argues that the legal incentives for early filing cause significant harm, including, most relevant to this Symposium on notice failure, that patents issued from early-filed applications tend to be overly broad because the applicant does not yet know how the claimed invention works.[3]

Lemley offers several recommendations to help solve this problem of overclaiming. To begin with, he would reduce incentives for early filing by ensuring that experimental uses or noncommercial sales of an invention (such as sales to beta testers) do not defeat the inventor's right to a patent so long as the inventor is diligently trying to perfect the invention.[4] He would also constrain patent scope directly by, for example, restricting patentees' ability to engage in functional claiming, a practice that essentially allows a patentee to claim to own any technology that solves a particular problem, rather than limiting the patentee to the particular solution he or she devised.[5]

Lemley makes a persuasive argument that patent law should, in general, offer more protection to patentees who build their inventions than it offers to

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[1] Mark A. Lemley, *Ready for Patenting*, 96 B.U. L. REV. 1171 (2016).

[2] *Id.* at 1172-73.

[3] *Id.* at 1173.

[4] *Id.* at 1194-95.

[5] *Id.* at 1192. For a comprehensive critique of functional claiming in modern patent law, see Mark A. Lemley, *Software Patents and the Return of Functional Claiming*, 2013 WIS. L. REV. 905, 908.

the mere "paper patentees" who never practice their inventions.[6] But, as I explain in the first part of this essay, protecting builders is not without cost. One of the primary legal incentives for early filing is the rule that, when several persons seek to patent an identical invention, the first person who filed a patent application gets the patent.[7] That priority rule can dissuade inventors from building their inventions (at least until they file a patent application), but it has the benefit of providing a clear, bright-line test. Similarly, although the experimental use doctrine (which protects experimental uses of an invention from defeating a patent's claim to novelty) can encourage inventors to perfect their invention before seeking a patent, applying that doctrine raises hard questions about whether a prior use of an invention was *genuinely* experimental. To be sure, the social costs of overbroad and underdeveloped patents that result from the early-filing incentives embedded in current law may outweigh the costs of the occasional fights over priority and novelty that would occur under the regime Lemley prefers. But his argument against early filing would be even stronger if it engaged the tradeoff between clear rules and fuzzy standards.

Lemley's critique of functional claiming as a source of overly broad patent protection is also persuasive, and it has already found traction in the courts. In June 2015, the Federal Circuit issued an en banc decision, *Williamson v. Citrix Online, LLC*,[8] that made the relevant law of claim construction more standard-like and less rule-like, offering courts newfound discretion to constrain the scope of patents drafted in functional terms.[9] Building on Lemley's critique of functional claiming, the second part of this essay considers the consequences of *Williamson* by looking at early district court decisions applying it. Those decisions confirm that *Williamson* provides a ground to narrow or even to invalidate the broadest functional patent claims. But the decisions also show how the new, standard-like law of claim construction offers courts ample discretion to maintain the status quo, if they so choose. Moreover, the early decisions applying *Williamson* provide a roadmap for future patent applicants to draft around the Federal Circuit's opinion and obtain broad, functionally defined claims. Accordingly, doctrines outside the sphere of claim construction, such as the requirement of patentable subject matter under § 101

[6] On paper patentees, see generally John F. Duffy, *Reviving the Paper Patent Doctrine*, 98 CORNELL L. REV. 1359, 1360 (2013).

[7] Before the America Invents Act took effect in March 2013, the first person to file *usually* received the patent, although the rules governing priority were relatively complex. *See* Mark A. Lemley & Colleen V. Chien, *Are the U.S. Patent Priority Rules Really Necessary?*, 54 HASTINGS L.J. 1299, 1300 (2003) (finding that the *last* person to file actually obtained priority in roughly forty percent of disputed cases). Under the simpler priority regime of the America Invents Act, the first person to file will practically always receive the patent. *See* 35 U.S.C. § 102 (2012).

[8] 792 F.3d 1339 (Fed. Cir. 2015).

[9] *Id.* at 1349-51.

of the Patent Act, will continue to be important to combating notice failure in patent law.

I. EARLY FILING: INCENTIVES, COSTS, AND BENEFITS

Does invention occur upon the mental act of conceiving a new idea? Or does invention occur only when the inventor builds a working embodiment of that idea—what, in patent parlance, would be called an "actual reduction to practice"? Our current patent law treats invention as something closer to conception than actual reduction to practice. Under the Patent Act of 1952 (which governs all patents whose applications were filed before March 16, 2013), priority generally goes to the first inventor to reduce an invention to practice without abandoning it.[10] Critically, however, the filing of a patent application counts as a "constructive" reduction to practice that secures an inventor's priority.[11] Thus, as Lemley observes, "[a]n inventor is better off filing a patent application as early as possible, before—or perhaps instead of—building a prototype or testing the invention."[12] The America Invents Act (which governs all patents with applications filed on or after March 16, 2013) creates an even stronger incentive for early filing by giving priority to the first inventor to file a patent application, regardless of who was the first to conceive the invention or to actually reduce it to practice.[13]

Lemley questions these strong incentives for early filing. He relies mainly on the work of Chris Cotropia, who has catalogued several problems with early filing, including: (1) it results in more patent applications, which adds to the backlog at the patent office and reduces the quality of examination; (2) it leads to a greater number of issued patents, many of which will go undeveloped because of the early stage at which they were obtained; and, most pertinent to this Symposium, (3) it causes patents to have unclear boundaries because, at the time of filing, the inventor does not know and therefore cannot describe how the invention actually works.[14] As Lemley elaborates, patents based on

[10] *See* ROBERT PATRICK MERGES & JOHN FITZGERALD DUFFY, PATENT LAW AND POLICY: CASES AND MATERIALS 426-27 (6th ed. 2013) (summarizing priority rules).

[11] *Id.* The notion that the 1952 Act treats invention as something closer to conception than reduction to practice is further illustrated by an exception to the rule that grants priority to the first inventor to reduce to practice: even if an inventor was the last to reduce the invention to practice, that inventor retains priority if he or she was the first to conceive the invention and was diligent in reducing it to practice. *See* Griffith v. Kanamaru, 816 F.2d 624, 626 (Fed. Cir. 1987).

[12] Lemley, *supra* note 1, at 1179.

[13] 35 U.S.C. § 102 (2012).

[14] Lemley, *supra* note 1, at 1187-88 (quoting Christopher A. Cotropia, *The Folly of Early Filing in Patent Law*, 61 HASTINGS L.J. 65, 70 (2009)).

guesses about how an invention might work are likely to be broader in scope than patents based on working models.[15]

Of course, a patent that does not adequately disclose how to make or use the invention is invalid due to the Patent Act's enablement requirement.[16] Lemley argues, however, that the courts have been too lax in enforcing that requirement, citing cases in which the Federal Circuit has ruled that a patent can be enabled by mere "prophetic examples"—basically, educated speculations about how one might make the invention—as well as cases that allow an inventor to establish priority even if the inventor was unsure whether the invention would work.[17] Although that case law appears troubling, it is hard to tell if it reflects a systemic problem of overclaiming by patent applicants. An accused infringer trying to show lack of enablement during litigation must do so by clear and convincing evidence—a higher evidentiary burden than applies during examination—which could explain why Federal Circuit decisions on enablement appear very friendly to patent holders.[18]

Still, the argument that early-filed patents tend to be broad in scope makes sense intuitively (although some might contend that broad, early-issued patents are necessary to ensure further development of the claimed technology).[19] Thus, rather than incentivizing early filing, Lemley argues, patent law should reward those who take the time to ensure that their invention works. One way to do that would be to eliminate paper patents and require actual reduction to practice before the patent office is allowed to issue a patent.[20] But Lemley

[15] *Id.* Another reason an early-filed patent might be broader than a later-filed patent is that an early patent applicant has less prior art to avoid and hence less reason to narrow the claims in the application. *See* WILLIAM M. LANDES & RICHARD A. POSNER, THE ECONOMIC STRUCTURE OF INTELLECTUAL PROPERTY LAW 320 (2003).

[16] 35 U.S.C. § 112(a) (requiring the patent's specification to "contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same").

[17] Lemley, *supra* note 1, at 1179 (citing Burroughs Wellcome Co. v. Barr Labs., Inc., 40 F.3d 1223, 1228 (Fed. Cir. 1994); Atlas Powder Co. v. E.I. du Pont De Nemours & Co., 750 F.2d 1569, 1577 (Fed. Cir. 1984)).

[18] Indeed, the high standard of proof seemed to play a role in the *Atlas Powder* decision. *See* 750 F.2d at 1577 ("Use of prophetic examples . . . does not automatically make a patent non-enabling. The burden is on one challenging validity to show by clear and convincing evidence that the prophetic examples together with other parts of the specification are not enabling. Du Pont did not meet that burden here.").

[19] *See* Edmund W. Kitch, *The Nature and Function of the Patent System*, 20 J.L. & ECON. 265, 268-69 (1977).

[20] For a recommendation along those lines, see Cotropia, *supra* note 14, at 120. *See also* Duffy, *supra* note 6, at 1360 (arguing for the revival of a doctrine under which "[m]ere paper patents . . . were construed narrowly and were more likely to be held invalid" but "patents successfully commercialized . . . were favored in determining patent scope and validity").

rejects the idea of eliminating paper patents, in part because it is unrealistic.[21] The clear trend in the law is to favor early filing, as illustrated by the recent statutory switch to a first-to-file priority rule. Lemley therefore focuses on a more modest goal, arguing that the law should, at minimum, not treat patent applicants *less* favorably because they tried to build and test their invention.[22]

At first glance, it is hard to disagree with that argument. The core purpose of patent law is utilitarian: it enhances social welfare by incentivizing the development of new and useful technology.[23] An invention that has been built and tested and that works seems more likely to increase social welfare than an invention that exists only on paper. That said, even if a working model exists, a good patent attorney will add claims that broaden the patent's scope as far as the patent office will allow, so disputes over patent breadth are unlikely to disappear even if the law were to discourage early filing.

More to the point, figuring out the optimal timing of patent issuance—should the patent issue upon conception? reduction to practice? sometime in between?—is an extraordinarily complex endeavor. On one hand, we want innovative technology to be shared with society as soon as possible, which helps explain patent law's emphasis on early filing.[24] On the other hand, we also want the invention disclosed in a patent—and the exclusive rights given to the inventor—to be tailored to the inventor's novel and nonobvious contribution, suggesting, as Lemley argues, that we ought not discourage inventors from building their inventions before filing their patent application. Lemley makes a strong case that, whatever the *optimal* timing of patent issuance, the law currently places too much emphasis on early disclosure. But Lemley's case is not lock-tight, for there remain good reasons to simply grant a patent to the inventor who wins the race to the patent office. This essay is, to be sure, not the space to fully consider the many possible justifications for early filing, but two common justifications are particularly relevant to Lemley's article.

First, as Lemley observes, the earlier a patent is granted, the earlier the patent will expire and the invention will enter the public domain.[25] Lemley concedes that earlier patent expiration is a social benefit that flows from early filing, and he acknowledges that that benefit undercuts his case against early filing.[26] But I am not sure Lemley should be so quick to make that concession, for earlier patent expiration might not matter much in the computer-related

[21] Lemley, *supra* note 1, at 1187-90.

[22] *Id.* at 1191.

[23] *See* Mark A. Lemley, *Property, Intellectual Property, and Free Riding*, 83 TEX. L. REV. 1031, 1031 (2005).

[24] Robert P. Merges & Richard R. Nelson, *On the Complex Economics of Patent Scope*, 90 COLUM. L. REV. 839, 878-79 (1990).

[25] Lemley, *supra* note 1, at 1186 (citing John F. Duffy, *Rethinking the Prospect Theory of Patents*, 71 U. CHI. L. REV. 439, 440 (2004)).

[26] *Id.*

fields where concerns about overly broad patents are most salient today.[27] Given the rapid pace of technological change in computer hardware and software, the patent term (currently twenty years from the date the application is filed[28]) is already longer than the useful life of most inventions.[29] Whether a patented software program passes into the public domain twenty years from today or twenty-*one* years from today—as might occur if we encouraged the inventor to more fully develop the invention before obtaining a patent—seems, at least on first blush, to be inconsequential.

Of course, one could cite several infamous examples of broad patents relied upon to assert infringement by technology developed long after the inventor filed the patent application. The late Jerome Lemelson, for instance, filed patent applications on barcode technology in the 1950s, but, because of his strategic use of continuations at the patent office, he was able to assert the patents against technology developed in the 1990s.[30] Similarly, in the 1980s, an inventor named Charles Freeny conceived of a kiosk for producing music tapes in retail stores using digital information.[31] The patent Freeny obtained, however, contained claims that were sufficiently abstract to allow a company called E-Data to assert the patent years later against firms engaged in the quite different field of Internet commerce.[32] Similar instances of overclaiming have occurred in biotechnology, where holders of patents covering early-stage research (such as gene fragments) have asserted their patents against later-developed practical applications of that research (such as diagnostic tests or therapeutic uses).[33] Likewise, in the pharmaceutical industry, sellers of brand name drugs sometimes obtain weak follow-on patents, such as patents on slightly different formulations, that do little more than extend market exclusivity.[34]

All of these examples are consistent with Lemley's concession that earlier patent expiration increases social welfare. Recent changes in the law, however, make similar examples of overclaiming less likely to occur in the future. These changes at least partly undermine the argument that early patent expiration

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[27] On the vagueness and overbreadth problems with software patents, see JAMES BESSEN & MICHAEL J. MEURER, PATENT FAILURE: HOW JUDGES, BUREAUCRATS, AND LAWYERS PUT INNOVATORS AT RISK 200 (2008).

[28] 35 U.S.C. § 154(a)(2) (2012).

[29] *See* Julie E. Cohen & Mark A. Lemley, *Patent Scope and Innovation in the Software Industry*, 89 CALIF. L. REV. 1, 46 (2001).

[30] *See* Karen E. Sandrik, *Warranting Rightful Claims*, 72 LA. L. REV. 873, 886-87 (2012). The Federal Circuit ultimately held Lemelson's patents to be unenforceable under the doctrine of prosecution laches. Symbol Techs., Inc. v. Lemelson Med., Educ. & Research Found., LP, 422 F.3d 1378, 1384 (Fed. Cir. 2005).

[31] *See* BESSEN & MEURER, *supra* note 27, at 8.

[32] *See id.* at 67.

[33] *Id.*

[34] Dan L. Burk & Mark A. Lemley, *Policy Levers in Patent Law*, 89 VA. L. REV. 1575, 1687 n.418 (2003).

justifies early filing. For example, Lemelson-style "submarine" patents are now harder to obtain because the patent term is tied to the date the application is filed rather than the date of issuance[35] and because publication of patent applications is usually required.[36] Likewise, as discussed in more detail below, recent Supreme Court decisions on patentable subject matter have limited the patentability of broad claims on basic research that can be used to assert infringement by later-developed applications of that research.[37]

To be clear, I do not mean to suggest that earlier patent expiration should be irrelevant as a policy goal. Rather, my point is that Lemley might *qualify* his concession that earlier patent expiration justifies early filing. In some circumstances, that is probably true. But in other circumstances, earlier patent expiration probably does not matter very much because, by the time the patent expires, the claimed technology is obsolete. Obsolescence before patent expiration is particularly likely with computer software, the field in which, again, the problem of overly broad patents is most severe.

A second justification for encouraging early filing—and one that Lemley's article discusses only briefly[38]—is that early filing lends itself to clear rules of priority and novelty. A first-to-file priority rule, although it incentivizes early filing, saves the patent office and the courts from conducting context-specific inquiries to determine whether an invention is patentable and, if so, who gets the patent. For instance, under pre-America Invents Act law, the person who was the first to conceive an invention but the last to reduce it to practice could still claim priority if that person was diligent in reducing the invention to practice.[39] Determining, based on all the circumstances, whether someone was diligent in reducing an invention to practice is much more difficult than determining who filed a patent application first. Interference proceedings to determine priority could last a decade or more[40] and cost the parties hundreds of thousands of dollars.[41] A first-to-file rule, though it encourages early filing, eliminates most disputes over priority.[42]

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[35] 35 U.S.C. § 154(a)(2) (2012).

[36] *See id.* § 122(b) (providing that applications will be published eighteen months after filing unless the applicant certifies that the invention will not be the subject of an application filed in another country that requires publication of applications).

[37] *See infra* Part II; *see also* Ass'n for Molecular Pathology v. Myriad Genetics, Inc., 133 S. Ct. 2107, 2111 (2013) (holding that isolated gene sequences are not patent eligible).

[38] Lemley, *supra* note 1, at 1195 n.123.

[39] *See, e.g.*, Griffith v. Kanamaru, 816 F.2d 624, 626 (Fed. Cir. 1987).

[40] *See, e.g.*, Brown v. Barbacid, 436 F.3d 1376, 1383 (Fed. Cir. 2006).

[41] *See* Charles R.B. Macedo, Note, *First-to-File: Is American Adoption of the International Standard in Patent Law Worth the Price?*, 1988 COLUM. BUS. L. REV. 543, 570 n.138.

[42] Although the America Invents Act eliminated interferences, it created a derivation proceeding, which allows an inventor to file a petition claiming that a person who filed an earlier application actually derived the invention from the petitioner and that, therefore, the petitioner should receive the patent. 35 U.S.C. § 135(a) (2012). The issues the patent office

Lemley also supports a robust experimental use doctrine as a way to ensure that those who actually build their inventions can still satisfy patent law's novelty requirement. But assessing whether a prior use was truly experimental, like assessing one's diligence in reducing an invention to practice, requires a fact-intensive and potentially costly inquiry. Some background: The Patent Act of 1952 (which, recall, governs all patents with applications filed before March 16, 2013) requires an inventor to file a patent application within one year of engaging in a public use or a sale of the invention or else the invention is deemed to have been anticipated and therefore is not patentable.[43] Under the 1952 Act, the one-year clock does not begin running if the inventor can show that the public use or sale was part of an experiment to perfect the invention.[44] Although this experimental use doctrine protects inventors who actually build their inventions, the doctrine is not easy to apply. In a leading case, the Federal Circuit canvassed its case law and collected *thirteen* factors that it deemed relevant to determining whether or not a public use or a sale was experimental.[45]

As Lemley notes, there is some debate about whether the experimental use doctrine survives the America Invents Act.[46] If, in fact, the doctrine has been abolished, inventors will be further incentivized to file early because *any* disclosure of the invention will start the running of the one-year grace period. Although abolition of the experimental use doctrine would, like a first-to-file priority rule, punish builders and incentivize early filing, it would help avoid fights over novelty, just as a first-to-file rule helps avoid fights over priority.

The benefits of bright-line rules of novelty and priority are, to be sure, difficult to quantify. And, although I have focused on the economic costs of fuzzy standards in this area of law, litigation under those fuzzy standards might sometimes produce valuable information about how the invention works,

may consider during a derivation proceeding are limited in scope, however. *See* Courtenay C. Brinckerhoff, *The Limited Scope of the New Derivation Proceedings*, PHARMAPATENTS (Oct. 16, 2012), https://www.pharmapatentsblog.com/2012/10/16/the-limited-scope-of-the-new-derivation-proceedings [https://perma.cc/A6H3-D8MJ]. And, to date, few derivation proceedings have been instituted. *See* Michael J. Bruner et al., *First PTAB Decisions in Derivation Proceedings*, JONES DAY (Dec. 2014), http://www.jonesday.com/first-ptab-decisions-in-derivation-proceedings-12-05-2014 [https://perma.cc/YHG4-8CD2].

[43] 35 U.S.C. § 102(b) (2006), *repealed by* America Invents Act, Pub. L. No. 112-29, § 3(b), 125 Stat. 284, 285-86 (2011). A similar rule applies under the America Invents Act in the form of a one-year grace period granted to an inventor who discloses the invention. *See* 35 U.S.C. § 102(b) (2012).

[44] *See* City of Elizabeth v. Am. Nicholson Pavement Co., 97 U.S. 126, 135 (1877).

[45] Allen Eng'g Corp. v. Bartell Indus., Inc., 299 F.3d 1336, 1353 (Fed. Cir. 2002).

[46] *See* Lemley, *supra* note 1, at 1183-85; *see also* U.S. PATENT & TRADEMARK OFFICE, MANUAL OF PATENT EXAMINING PROCEDURE § 2133.03(e) (9th ed. 2015) (stating that the experimental use doctrine is "not applicable to applications subject to examination under the first inventor to file . . . provisions of the [America Invents Act]").

getting the invention closer to commercialization.[47] More fundamentally, the costs of occasional but complex disputes over novelty and priority may be outweighed by the social costs of overbroad and underdeveloped patents that result from early-filing incentives. But Lemley's argument in favor of protecting inventors who build and test their inventions would be even stronger if it contained a more extensive discussion of the tradeoff between rules and standards in this area.

In sum, Lemley tells a persuasive story about how legal incentives for early filing are contributing to a proliferation of overly broad patents. To solve that problem, Lemley recommends, among other things, strengthening patent law's disclosure doctrines, particularly the enablement requirement, to ensure that inventors are required to disclose precisely how their invention works before filing a patent application.[48] One area of particular concern to Lemley is the abuse of functional claiming, especially by the owners of patents on computer software.[49] Functional claiming essentially allows software patentees to claim to own the function of their program, not merely the particular way their program performs that function.[50] If those functional patent claims were limited to the solutions actually described in the patent's specification, Lemley argues, inventors would have a greater incentive to build and test before running to the patent office.[51] By contrast, when functional claims are not limited to the specific solutions disclosed, the incentive is to file a patent application as early as possible so that the inventor can secure priority, safe in the knowledge that the patent's scope can, in later infringement litigation, be expanded as necessary to cover the allegedly infringing technology.

Interestingly, the Federal Circuit in 2015 issued an en banc decision that, consistent with Lemley's recommendation, appears to restrict the ability of

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[47] *Cf.* Cotropia, *supra* note 14, at 95-96 (discussing how early filing impedes production of technical information about the invention and of information about any potential market for the invention).

[48] Although Lemley situates his argument for curtailing broad claim scope within the disclosure doctrines of § 112 of the Patent Act, other doctrines could also be used to control claim scope. For example, if inventions were required to be not only "practically" useful (as is the case under current case law applying the utility requirement of § 101) but also "commercially" useful, broad claims reciting inventions for which there is no market or that cannot be produced in a cost-effective manner might be found to be unpatentable. *See* Michael Risch, *Reinventing Usefulness*, 2010 BYU L. REV. 1195, 1200, 1240-41; *see also* Michael Risch, *A Surprisingly Useful Requirement*, 19 GEO. MASON L. REV. 57, 103 (2011) ("Patent specifications that represent significant leaps in usefulness . . . should be entitled to broader claims."). And, of course, claim scope can always be altered in litigation at the claim construction and infringement stages. *See, e.g.*, Merges & Nelson, *supra* note 24, at 852-68. I do not read Lemley's focus on § 112 to exclude these possible alternatives.

[49] Lemley, *supra* note 1, at 1192.

[50] Lemley, *supra* note 5, at 907.

[51] Lemley, *supra* note 1, at 1192-93.

patentees to obtain broad claim scope through functional claiming.[52] The next part of this essay reviews the Federal Circuit's decision and takes an initial look at district court decisions applying it in order to see if it has brought us any closer to solving the problems of patent scope that Lemley identifies in his article.

II. *WILLIAMSON* AND ITS CONSEQUENCES

Section 112(f) of the Patent Act permits patent claims to be written in what is called means-plus-function format, stating that a claim element "may be expressed as a means . . . for performing a specified function without the recital of structure."[53] If an element is written in means-plus-function format, § 112(f) requires the claim to be construed to cover only the corresponding structure disclosed in the patent's specification and the equivalents of that structure.[54] If an element is determined *not* to be drafted in means-plus-function format, § 112(f) does not apply and the claim's scope is not necessarily limited to the structures disclosed in the specification. Finally, if an element *is* written in means-plus-function format but the specification does not disclose structure for performing the claimed function, the patent claim containing that element is invalid as indefinite.[55]

Thus, determining whether a claim limitation has, in fact, been drafted in means-plus-function format is critical to determining both the claim's scope and its validity.[56] A key factor in making that threshold determination is

[52] Lemley himself wrote an amicus brief urging the court to rehear the case en banc. *See* Corrected Brief Amici Curiae Intellectual Property Professors in Support of En Banc Review, Williamson v. Citrix Online LLC, 792 F.3d 1339 (Fed. Cir. 2015) (No. 2013-1130), 2014 WL 7405154.

[53] 35 U.S.C. § 112(f) (2012). Before the America Invents Act, the subsections of § 112 were contained in a series of separate paragraphs, and the discussion of means-plus-function claiming was found in paragraph 6. For consistency, I refer to the relevant subsection as § 112(f), even though many of the cases discussed, because they involve patents filed before the America Invents Act, involve substantively identical § 112 ¶ 6.

[54] *Id.*

[55] *See* Noah Sys., Inc. v. Intuit Inc. 675 F.3d 1302, 1311-12 (Fed. Cir. 2012).

[56] In a separate contribution to this Symposium, John Duffy argues that this inquiry into whether a limitation has been drafted in means-plus-function format is necessary only because of the Federal Circuit's misguided approach to claim construction. John F. Duffy, *Counterproductive Notice and Literalistic Versus Peripheral Claiming*, 96 B.U. L. REV. 1197, 1209 (2016). Duffy asserts that the Federal Circuit, in allowing the literal language of the claims to define the patent's scope, has ignored older case law suggesting that a patent's scope should be limited to the embodiments disclosed in the specification and their equivalents. *Id.* at 1207. Drawing on this older case law, Duffy argues that the admonition in § 112(f)—that claims containing means-plus-function elements should be construed to cover only the structures disclosed in the specification—does nothing more than confirm that those claims should be governed by the same interpretative rule that governs *all* patent

whether the claim contains the word "means." If it does, there is a rebuttable presumption that the claim is a means-plus-function claim subject to § 112(f).[57] Conversely, if the claim does not contain the word "means," there is a rebuttable presumption that § 112(f) does not apply.[58]

Beginning about ten years ago, the Federal Circuit strengthened the presumption that § 112(f) does not apply if a claim does not include the word "means," characterizing the presumption as "strong" and "not readily overcome."[59] Consequently, patent applicants, particularly in the software industry, began to draft and obtain claims that were functional and lacked structure, but that avoided the requirements of § 112(f) by omitting the term "means."[60] For instance, rather than describing a software invention as a "means for" performing some function, applicants drafted claims that used so-called nonce terms such as "system for" or "mechanism for" performing that function.[61] Or they claimed a computer "capable of" or "configured to" perform a particular function.[62] The advantage of this tactic to a patentee is breadth: a claim that is not subject to § 112(f) will not be limited to the structures recited in the specification and will not be found to be invalid simply because the specification does not disclose a structure, such as a specific algorithm, to perform the claimed function.[63]

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claims, to wit, that the claims' scope should be limited to the embodiments disclosed. *Id.* at 1210.

[57] Personalized Media Commc'ns, LLC v. Int'l Trade Comm'n, 161 F.3d 696, 703-04 (Fed. Cir. 1998).

[58] *Id.*

[59] *E.g.*, Lighting World, Inc. v. Birchwood Lighting, Inc., 382 F.3d 1354, 1358 (Fed. Cir. 2004).

[60] Lemley, *supra* note 5, at 926-28.

[61] *See id.* at 923. In patent argot, nonce terms are "substitutes for the word 'means' that facially suggest structure but, in fact, merely describe function." David J. Kappos & Christopher P. Davis, *Functional Claiming and the Patent Balance*, 18 STAN. TECH. L. REV. 365, 367 (2015). In more general usage, a nonce term is a word created for a particular purpose. *See Nonce*, OXFORD ENGLISH DICTIONARY (5th ed. 2003). Examples include quark (for the subatomic particle), grok (to understand), and, personal favorites of mine, embiggen and cromulent, *see The Simpsons: Lisa the Iconoclast* (Fox television broadcast Feb. 18, 1996), as in "a noble spirit embiggens the smallest man" and "embiggen is a perfectly cromulent word." *See generally Nonce Words*, WIKIPEDIA, https://en.wikipedia.org/wiki/Nonce_word [https://perma.cc/KSY2-EV9S].

[62] *See* Lemley, *supra* note *5*, at 926.

[63] For evidence of patentees' increasing use of nonce terms, see Dennis Crouch, *Functional Claim Language in Issued Patents*, PATENTLY-O (Jan. 23, 2014), http://patentlyo.com/patent/2014/01/functional-language-patents.html [https://perma.cc/9TVM-ALAP]. According to Crouch's data, until about 1996, over 50% of patents included an independent claim containing the phrase "means for." *Id.* Today, that number is less than 10%. *Id.* Instead, nearly 50% of patents include a claim containing the phrase "for . . .ing" (such as "for calculating") *without* using the term "means," up from about 30% in the mid-

The Federal Circuit's recent decision in *Williamson* restricts the ability of patent applicants to avoid the strictures of § 112(f) by simply omitting the term "means." In the *Williamson* case, the Federal Circuit overruled the "strong" presumption that a limitation lacking the word "means" is not subject to § 112(f).[64] Although the presumption remains, the court emphasized that the key inquiry is "whether the words of the claim are understood by persons of ordinary skill in the art to have a sufficiently definite meaning as the name for structure."[65] If the claim contains no structure, § 112(f) applies and the claim's scope will be limited to the structures in the specification.

The facts of *Williamson* illustrate how the § 112(f) analysis now works. The patent-in-suit described methods and systems for "distributed learning," which essentially amounted to using standard computers linked by a network to create a virtual classroom that connected a presenter to geographically remote audience members.[66] The claim limitation at issue recited a "*distributed learning control module* for receiving communications transmitted between the presenter and the audience member computer systems and for relaying the communications to an intended receiving computer system and for coordinating the operation of [a] streaming data module."[67]

The district court treated the claim limitation as a means-plus-function limitation subject to § 112(f), but a panel of the Federal Circuit reversed, emphasizing that the district court "failed to give weight to the strong presumption that [§ 112(f)] did not apply based on the absence of the word 'means.'"[68] On rehearing, the en banc Federal Circuit affirmed the district court in relevant part, ruling that the "distributed learning control module" limitation was subject to § 112(f).[69] The Federal Circuit emphasized that the claim was written in a format consistent with traditional means-plus-function claims, reciting a "module for [performing a function]."[70] The court also observed that the claim simply replaced the term "means" with "module"—"a well-known nonce word."[71] The court then turned to the question of indefiniteness. The patent's specification, according to the court, made clear that the claimed function must be performed on "a general purpose computer programmed to perform particular functions."[72] In that circumstance, the

1990s. *Id.* And nearly 30% of patents now contain the phrase "configured to," up from less than 5% in the mid-1990s. *Id.*

[64] Williamson v. Citrix Online, LLC, 792 F.3d 1339, 1349 (Fed. Cir. 2015) (en banc in relevant part).

[65] *Id.*

[66] *Id.* at 1343.

[67] *Id.* at 1344.

[68] Williamson v. Citrix Online, LLC, 770 F.3d 1371, 1379 (Fed. Cir. 2014).

[69] *Williamson*, 792 F.3d at 1354.

[70] *Id.* at 1350-51.

[71] *Id.* at 1350.

[72] *Id.* at 1352.

specification must disclose an algorithm (that is, a sequence of steps or operations[73]) for performing the claimed function.[74] Because the specification did not disclose an algorithm, the court held the patent claim to be invalid for indefiniteness.[75]

Williamson should make it easier for accused infringers to show that limitations that include nonce words such as "module" or "system" are subject to § 112(f), meaning that they will be construed to cover only the structures disclosed in the specification. Narrower claim constructions make it easier to show noninfringement, and a broader applicability of § 112(f) offers expanded opportunities to argue that a patent is invalid for failing to disclose structure to perform a claimed function. *Williamson* thus pushes the law in the direction sought by Lemley in *Ready for Patenting*: by subjecting a greater number of patents to the requirement that they disclose structure, patent applicants will be forced to build and test their invention so they can disclose that structure. Moreover, as Lemley notes, a patentee who, in an effort to disclose the required structure, provides only "prophetic examples" about how an invention *might* work will be limited to those prophetic examples and forbidden from claiming different, later-developed solutions that *actually* work.[76]

Whether the changes made by *Williamson* to the law of claim construction are significant will be determined in large part by the federal district courts, which confront claim construction issues more frequently and in greater numbers than the Federal Circuit. Although this essay is not the place for a comprehensive analysis of *Williamson*'s effects, several recent district court cases are particularly noteworthy because the court in each case twice considered whether § 112(f) applied to particular claim limitations—once before *Williamson* and again after *Williamson*. Accordingly, those cases provide useful clues about the likely consequences of the Federal Circuit's decision.

One consequence, as the facts of *Williamson* suggest, is that functional claims that are particularly broad and vague will either be limited in scope or invalidated. The Central District of California's decision in *Farstone Technology, Inc. v. Apple Inc.*[77] illustrates this point. In that case, Farstone, the patentee, alleged that the Time Machine features of Apple's computers infringed its patent, which involved technology that created a backup of data

[73] Allen Newell, *Response: The Models Are Broken, the Models Are Broken*, 47 U. PITT. L. REV. 1023, 1024 (1986).

[74] *Williamson*, 792 F.3d at 1352 (citing Net MoneyIN, Inc. v. VeriSign, Inc., 545 F.3d 1359, 1367 (Fed. Cir. 2008)); *see also* Media Rights Techs., Inc. v. Capital One Fin. Corp., 800 F.3d 1366, 1374 (Fed. Cir. 2015) ("The algorithm may be expressed as a mathematical formula, in prose, as a flow chart, or in any other manner that provides sufficient structure.").

[75] *Williamson*, 792 F.3d at 1354.

[76] Lemley, *supra* note 1, at 1193.

[77] No. 8:13-CV-1537, 2015 WL 5898273 (C.D. Cal. Oct. 8, 2015).

stored on a hard disk and enabled a user to later restore that data.[78] The key claim limitation recited "a processing system having at least one hardware resource with a backup/recovery module, said backup/recovery module creating at least one recovery unit to hold backup data."[79] In a claim construction order issued before *Williamson*, the court rejected Apple's argument that the "processing system" limitation should be construed as a means-plus-function limitation.[80] The court noted the "strong presumption" against means-plus-function claim construction when the term "means" is not used and found that Apple had not rebutted that presumption.[81] The court reasoned that the claim referenced the "processing system" in structural terms, as a portion of computer equipment with a hardware resource that included a backup/recovery module.[82]

After *Williamson*, the court supplemented its prior claim construction order and invalidated the claim as indefinite because "backup/recovery module" was a means-plus-function element unsupported by structure.[83] Analogizing to *Williamson*, the court noted that "module" is a "well-known nonce word" that substitutes for "means" and that the claim was drafted in a format consistent with traditional means-plus-function limitations.[84] The court also noted that the claim did not impart any structural significance to the backup/recovery module.[85] It did not, for instance, "describe how the 'backup/recovery module' creates a recovery unit to hold backup data."[86] On the issue of validity, the court, again like the en banc Federal Circuit in *Williamson*, observed that the specification provided no algorithm for the function of creating a recovery unit and thus held the claim to be invalid as indefinite.[87]

Farstone illustrates how courts can now subject many software patents to the requirements of § 112(f)—and thereby narrow or invalidate them—by simply analogizing to *Williamson*. Yet other recent decisions make clear that, even after *Williamson*, not all limitations that contain nonce words and functional language will be deemed to be means-plus-function limitations subject to § 112(f). The decisions also show future patent applicants how to draft around *Williamson* by simply including structural details in the patent

[78] *Id.* at *1.

[79] *Id.*

[80] Farstone Tech., Inc. v. Apple Inc., No. 8:13-CV-1537, 2015 WL 857706 (C.D. Cal. Feb. 27, 2015).

[81] *Id.* at *11.

[82] *Id.* at *12.

[83] Farstone Tech., Inc. v. Apple Inc., No. 8:13-CV-1537, 2015 WL 5898273, at *3 (C.D. Cal. Oct. 8, 2015).

[84] *Id.*

[85] *Id.*

[86] *Id.*

[87] *Id.* at *5.

claim itself, even if those details add little substance and therefore keep the scope of the claim quite broad.

In *M2M Solutions LLC v. Sierra Wireless America, Inc.*,[88] for example, the District of Delaware ruled that a limitation containing the nonce term "module"—the same term at issue in *Williamson* and *Farstone*—was not a means-plus-function limitation, meaning that the patent would not be invalidated for failing to disclose an algorithm for performing the claimed function.[89] The patent in that case related to wireless communication networks. The relevant claim limitation recited, in the convoluted fashion familiar to patent lawyers:

> a processing module for authenticating an at least one transmission sent from a programming transmitter and received by [a] programmable communicator device, the at least one transmission including a coded number and at least one telephone number or Internet Protocol (IP) address corresponding to an at least one monitoring device, where the processing module authenticates the at least one transmission by determining if the at least one transmission contains the coded number, the processing module authenticating the at least one transmission if the transmission includes the coded number.[90]

Before the Federal Circuit decided *Williamson*, the district court in *M2M* rejected the accused infringers' argument that "processing module" was a means-plus-function limitation, relying in part on decisions by other district courts that "module" connotes sufficient structure to avoid the application of § 112(f).[91]

After *Williamson*, the accused infringers argued that the court should reconsider its earlier ruling because, as in *Williamson* and *Farstone*, the claim simply used "module" as a substitute for "means."[92] The court conceded that "it is probably the case that the word 'processing' by itself fails to provide sufficient structure in the term 'processing module.'"[93] However, in reaffirming its earlier conclusion that § 112(f) did not apply, the court relied on a declaration by the patentee's expert stating that the claim language surrounding the term "processing module" explains how the authenticating function is to be performed.[94] According to that declaration, the claim disclosed a "simple three step algorithm": "(1) identifying a coded number contained in a received incoming transmission; (2) retrieving a coded number stored locally in memory on the receiving device; and (3) comparing the coded

[88] No. CV 12-30, 2015 WL 5826816 (D. Del. Oct. 2, 2015).

[89] *Id.* at *5.

[90] *Id.* at *4.

[91] *Id.* at *3.

[92] *Id.*

[93] *Id.* at *4.

[94] *See id.*

number from the transmission with the coded number retrieved from memory to determine whether they match."[95]

M2M illustrates how future patent applicants can try to draft around *Williamson* by merely including some details in the claim itself about *how* the function is performed, even if the structure disclosed is, as the patentee's own expert stated in *M2M*, "simple." That simple algorithm—which consists of using coded numbers to identify devices on a particular network—could conceivably be infringed by a wide array of wireless communication systems.

In another district court decision reconsidering a claim construction order after *Williamson*, *Collaborative Agreements, LLC v. Adobe Systems Inc.*,[96] the Northern District of California, like the court in *M2M*, found claim language to provide sufficient structure to avoid the application of § 112(f), even though the structure disclosed was very straightforward, consisting primarily of conventional computer hardware.[97] The patent-in-suit described a computer program that allows sellers of intellectual property to disclose information to potential buyers while also maintaining control over the information.[98] The claim limitation at issue recited a "code segment" for performing various functions including "receiving . . . electronic documents and an identity validation at a server" from one party's computer, receiving at the server an identity validation from the counterparty's computer, and "posting the received electronic documents" on the server so that the counterparty can view them.[99] Similar to the court in *M2M*, the court in *Collaborative Agreements* emphasized that the claim language did "not simply describe broadly phrased high-level functions."[100] Instead, the claim "describe[d] the objective and operation of the code segment . . . while also describing the structural interactions among the computer program's code segment components."[101] Distinguishing *Williamson*, the court noted simply that "the claim language describes the code segment's operation with a degree of specificity not present" in that case.[102]

Finally, in *Magna Electronics, Inc. v. TRW Automotive Holdings Corp.*,[103] the Western District of Michigan, on a post-*Williamson* motion for reconsideration, rejected the argument that a vehicular "crash avoidance system" was a means-plus-function limitation.[104] The court emphasized that the claim recited structure, including a camera that included a lens and an

[95] *Id.* at *4 n.4.

[96] No. 15-CV-3853, 2015 WL 7753293 (N.D. Cal. Dec. 2, 2015).

[97] *Id.* at *9.

[98] *See id.* at *1-2.

[99] *Id.* at *2.

[100] *Id.* at *5.

[101] *Id.*

[102] *Id.* at *6.

[103] No. 1:12-CV-654 (W.D. Mich. Jan. 6, 2016), ECF No. 674.

[104] *Id.*, slip op. at 11.

imager, a mounting element, a mechanism for mounting the system to the windshield, and a module including a housing for the camera.[105] Although the court found those elements to provide sufficient structure to avoid § 112(f), they are quite generic, consisting mainly of a camera inside of a housing mounted to a car's windshield. The patent in *Magna Electronics* could, therefore, encompass a broad range of automobile safety systems.

Williamson, to be sure, closed a drafting loophole. Section 112(f), recall, limits means-plus-function limitations to the specific structures disclosed in the patent's specification. And if the specification discloses no structure for performing the function claimed in a means-plus-function limitation, the patent claim is invalid. After *Williamson*, a patentee can no longer avoid those narrowing (or invalidating) doctrines by simply omitting the term "means" from its claims. Yet, as illustrated by *M2M*, *Collaborative Agreements*, and *Magna Electronics*, patent claims that provide *some* detail about how a claimed function is performed will still avoid application of § 112(f), even if the implementing structure is relatively "simple," as in *M2M*, consists primarily of conventional computer hardware, as in *Collaborative Agreements*, or is highly generic, like the camera, housing, and mounting element in *Magna Electronics*.[106]

Of course, other factors may contribute to courts' reluctance to reconsider their prior claim constructions. Some courts apply a high bar for reconsidering prior orders, even if there has been a change in the law.[107] There are probably anchoring effects, too. Not only are judges likely predisposed to adhere to prior decisions, intervening events—such as a trial—can make the costs of reconsideration unacceptably high.[108]

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[105] *Id.*

[106] In addition to the cases discussed in the text, I have located one other decision in which a district court denied a post-*Williamson* motion for reconsideration. The research in this essay is current through January 2016. In *Smartflash LLC v. Apple Inc.*, No. 6:13-CV-447, 2015 WL 4208754 (E.D. Tex. July 7, 2015), the court ruled, in a case involving patents on data storage and access systems, that claim limitations containing the terms "processor" and "code" were not means-plus-function limitations. *Id.* at *3. The court noted that that the accused infringer's own experts had opined that those terms, on their own, connoted structure to persons of ordinary skill in the art and that, in any case, the claims "include[d] substantial additional language describing the operation of the components at issue and their interaction with other components." *Id.* (footnote omitted). Because of the court's estoppel-like reasoning, the case does not seem particularly significant to an analysis of *Williamson*'s likely effects.

[107] *See, e.g.*, *Magna Elecs.*, No. 1:12-CV-654, slip op. at 1-2 (stating that "the party moving for reconsideration bears a 'heavy' burden to . . . 'show that a different disposition of the case *must* result'" from the change in governing law (quoting W.D. MICH. CIV. R. 7.4(a))).

[108] For instance, at the time of the motion for reconsideration in *Smartflash*, *see supra* note 106, a jury had already found that the patents were infringed and not invalid. *See*

Or the decisions in *M2M*, *Collaborative Agreements*, and *Magna Electronics* might simply be wrong.[109] At a minimum, the cases illustrate the wide discretion courts now have in deciding whether to apply § 112(f). Before *Williamson*, Federal Circuit law provided a relatively bright-line rule: if a claim did not contain the word "means," § 112(f) was almost always irrelevant. Now, the law is more standard-like, giving courts more leeway in deciding whether to treat a limitation as a means-plus-function limitation. Although *Williamson* offers courts a clear path for applying § 112(f) to many functional claims, *M2M*, *Collaborative Agreements*, and *Magna Electronics* illustrate how most patent claims will contain at least some structure that a court can invoke to justify a conclusion that § 112(f) should not apply. Ultimately, it may be up to the Federal Circuit, which generally reviews de novo the issue of whether § 112(f) applies,[110] to ensure consistency in the law. But the discretion provided by *Williamson* could facilitate inconsistency among different panels of the Federal Circuit—a phenomenon that already exists in other aspects of Federal Circuit claim construction law.[111]

The decisions that refuse to apply § 112(f) also provide a roadmap for future patent applicants to draft around *Williamson*. For instance, the patentee in *Williamson* would have had a strong argument against applying § 112(f) if the claim had succinctly explained how the distributed learning control module worked, such as by receiving data at a server computer via a network from an audience member's computer and relaying the data via the network from the server computer to the presenter's computer.[112] Those additional limitations, one might argue, provide a simple, two-step algorithm that, like the algorithm supposedly disclosed by the patent in *M2M*, provides structure (consisting

Smartflash LLC v. Apple Inc., No. 6:13-CV-447, 2015 WL 4093132 (E.D. Tex. Feb. 24, 2015).

[109] *See* Lemley, *supra* note 1, at 1192-93 n.116.

[110] *See* Williamson v. Citrix Online, LLC, 792 F.3d 1339, 1346 (Fed. Cir. 2015) (citing Teva Pharms. USA, Inc. v. Sandoz, Inc., 135 S. Ct. 831, 840-41 (2015)).

[111] *See* R. Polk Wagner & Lee Petherbridge, *Is the Federal Circuit Succeeding? An Empirical Assessment of Judicial Performance*, 152 U. PA. L. REV. 1105, 1111 (2004).

[112] *See* Michael Risch, *The Past and Future of Functional Claiming*, WRITTEN DESCRIPTION (June 16, 2015), http://writtendescription.blogspot.com/2015/06/the-past-and-future-of-functional.html [https://perma.cc/6FGV-JLLK] (observing that, in *Williamson*, the patentee identified in the specification "figures that showed the input fields and the selection of the intended computer systems" and suggesting that the patentee could have avoided application of § 112(f) by adding to the claim "a paragraph that said: 'get data from audience client software and send data to a computer programmed to receive and process such data (and located at the address selected from the list)'"). For a similar effort at redrafting the claim from *Williamson* to avoid § 112(f), see Michael D. Stein, *How Structural Claim Limitations Can Save Software Patents*, LAW360 (Feb. 9, 2016), http://www.law360.com/ip/articles/751757/how-structural-claim-limitations-can-save-software-patents [https://perma.cc/69Y5-ATCG] (conceding that one "could argue that the limitations added to the claim are generic limitations inherent in any modern computer").

mainly of conventional computer hardware, as in *Collaborative Agreements*) and avoids application of § 112(f).[113] To make the argument against applying § 112(f) even stronger, the applicant could easily add information about how the server computer processes the data and coordinates the operation of the entire system for conducting distributed learning, although that type of information would begin to narrow the scope of the claim.

Because *Williamson* could prove easy to draft around, other doctrines—particularly the patentable subject matter requirement of § 101 of the Patent Act—will remain important to curtailing overly broad patents. Since 2010, the Supreme Court has applied the patentable subject matter requirement with increased rigor, forbidding patents from covering "abstract ideas" merely because those ideas are implemented on a computer. In *Alice Corp. v. CLS Bank International*,[114] for example, the Court invalidated patents on methods and computer systems for ensuring that a party to a transaction will make payment.[115] And in *Bilski v. Kappos*[116] the Court held unpatentable methods of hedging financial risk that almost certainly would have been performed on a computer.[117] Thus, many computer-related patents, even if they are not subject to § 112(f) under *Williamson*, remain vulnerable to § 101 validity challenges.

In this vein, one could argue that the patent in *Collaborative Agreements*, although not narrowed or invalidated under § 112(f), is invalid under § 101 because, like the patents in *Alice*, it claims nothing more than the use of a computer to solve a long-recognized problem: the risk that a party to a transaction might later disclose sensitive information learned during negotiations.[118] Moreover, the patent in *M2M*, which claims a module that

[113] For criticism of decisions that have found generic computer hardware and algorithmic descriptions of function to be sufficient structure to avoid § 112(f), see Kevin Emerson Collins, *The* Williamson *Revolution in Software's Structure*, 31 BERKELEY TECH. L.J. (forthcoming 2016) (manuscript at 47, 54-55) (on file with author) (arguing that, after *Williamson*, the Federal Circuit should either treat all software patents as lacking structure and therefore subject to § 112(f) or articulate a new, stand-alone definition of structure to be used in construing software patents).

[114] 134 S. Ct. 2347 (2014).

[115] *Id.* at 2358.

[116] 561 U.S. 593 (2010).

[117] *Id.* at 611-12.

[118] This problem embodies economist Kenneth Arrow's famous information paradox: one party has information to sell that is valuable only because it is secret, but no buyer would purchase the information without a chance to inspect it. *See* Kenneth J. Arrow, *Economic Welfare and the Allocation of Resources for Invention*, *in* NAT'L BUREAU OF ECON. RESEARCH, THE RATE AND DIRECTION OF INVENTIVE ACTIVITY: ECON. AND SOCIAL FACTORS 609, 615 (1962). To my knowledge, § 101 issues have not been litigated in *Collaborative Agreements*, although the accused infringer raised § 101 as a defense in its answer. *See* Defendant's Answer to Second Amended Complaint at 6, Collaborative Agreements, LLC v. Adobe Sys. Inc., No. 15-CV-3853 (N.D. Cal. Oct. 6, 2014), ECF No. 55.

identifies, retrieves, and compares two numbers, resembles yet another patent recently invalidated by the Supreme Court on § 101 grounds, which claimed the steps of administering a drug to a patient, determining metabolite levels in the bloodstream, and comparing those levels to ranges disclosed in the patent.[119] One could also argue that the patent in *Magna Electronics* fails § 101 because, like the patents in *Alice* and other pathmarking § 101 decisions, it claims an abstract idea (avoiding car crashes) implemented through conventional technology (a windshield mounted camera).[120] And, as this essay was going to press, the district court in *Williamson* (on remand from the Federal Circuit) invalidated several other claims of the patent in that case for failing to satisfy § 101.[121] The invalidated claims included a claim to a "method of conducting distributed learning" and a functional claim to a "distributed learning server" that apparently disclosed enough structure to avoid § 112(f).[122] The court reasoned that the claims were directed to the abstract idea of creating a virtual, interactive learning environment and that the abstract idea was not patent eligible because it was implemented on industry-standard computer hardware and software.[123]

Interestingly, Lemley, in his prior writing on functional claiming, foresaw precisely this interplay between means-plus-function claiming and § 101. Two years before the Federal Circuit decided *Williamson*, he suggested that functional claims that are not treated as means-plus-function claims subject to § 112(f) (and hence are not limited to the specific examples described in the specification) will likely be invalid under § 101 because they are too abstract. Accordingly, Lemley noted that restricting functional claiming would have the unexpected effect of saving many software patents from invalidation.[124]

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[119] *See* Mayo Collaborative Servs. v. Prometheus Labs., Inc., 132 S. Ct. 1289, 1297-98 (2012). *Mayo*, it should be noted, involved a patent on the diagnostic method itself, whereas *M2M* involves a patent on an apparatus that performs a particular function, so the analogy is not perfect. *See* M2M Solutions LLC v. Sierra Wireless Am., Inc., No. CV 12-30, slip op. at 32 (D. Del. Jan. 6, 2016), ECF No. 247 (denying the accused infringer's motion for summary judgment of invalidity, which argued that the patent impermissibly claimed both an apparatus and a method).

[120] *See Bilski*, 561 U.S. at 610-11 ("[T]he prohibition against patenting abstract ideas cannot be circumvented by attempting to limit the [idea] to a particular technological environment or adding insignificant postsolution activity." (quoting Diamond v. Diehr, 450 U.S. 175, 191-92 (1981) (internal quotation marks omitted))). To my knowledge, the patent from the *Magna Electronics* case was not subjected to a § 101 challenge, and the case has since settled. *See* Magna Elecs., Inc. v. TRW Auto. Holdings Corp., No. 1:12-CV-654 (W.D. Mich. Feb. 5, 2016), ECF Nos. 848-49.

[121] Williamson v. Citrix Online, LLC, No. 11-CV-2409, slip op. at 1 (C.D. Cal. Feb. 17, 2016), ECF No. 531.

[122] *Id.* at 2-3.

[123] *Id.* at 10, 12-13 (citing Alice Corp. v. CLS Bank Int'l, 134 S. Ct. 2347, 2358 (2014)).

[124] Lemley, *supra* note 5, at 962-63.

Having surveyed the post-*Williamson* case law, it seems likely that Lemley's predictions will prove correct.

CONCLUSION

Ready for Patenting offers a lucid explanation of a critical, notice-related problem in patent law and clear and realistic prescriptions to help solve it. The Federal Circuit in *Williamson* embraced one of Lemley's recommendations by curtailing the abuse of functional claiming. Under *Williamson*, means-plus-function patentees will not be able to file early and obtain broad claim scope in later litigation. Although patent applicants may be able to draft around *Williamson* by providing generic structure that avoids application of § 112(f), the decision—coupled with an invigorated requirement of patentable subject matter under § 101—represents at least a small step toward ensuring that patent law protects inventors who do the difficult work of building prototypes and testing their ideas.