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UNRESOLVED MEANS-PLUS-FUNCTION ISSUES POST-WILLIAMSON

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Unresolved Means-Plus-Function Issues Post-Williamson

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“[A]pplying a claim drafted under § 112 para. 6 . . . is not a simple task.”
– U.S. Court of Appeals for the Federal Circuit¹

Introduction

A patent grants its owner a twenty-year, exclusive right to “make[], use[], offer[] to sell, or sell[]” the patented invention.² In exchange for this monopoly, the inventor must disclose the invention to the public in the form of a patent.³ To obtain a patent, the inventor must provide claims and a specification: together, they describe the invention.⁴ The claims define the scope of the patent,⁵ while the specification is used to explain the scope of the patent claims.⁶

United States patent law allows inventors to use functional claiming by way of a “means-plus-function” claim.⁷ Functional claiming “refers to the . . . notion of claiming an invention by what it does,” in contrast to defining an invention in terms of its physical components or method of production.⁸ Functional claiming was once prohibited. In its decision in *Halliburton Oil v. Walker* in 1946, the U.S. Supreme Court held that claims using functional language were invalid.⁹ The Court feared “the broadness, ambiguity, and overhanging threat” created by the functional claims’ lack of structure, believing that functional claiming would grant broader scope

¹ *Symbol Techs., Inc. v. Opticon, Inc.*, 935 F.2d 1569, 1575 (Fed. Cir. 1991).

² 35 U.S.C. §§ 154(a)(2), 271 (a) (2018).

³ 35 U.S.C. § 111(a)-(b) (2018).

⁴ *Id.*

⁵ *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc) (“[T]he claims of a patent define the invention to which the patentee is entitled the right to exclude.”) (quoting *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004)); *Vitronics Corp. v. Conceptor, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996); *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 980 (Fed. Cir. 1995) (en banc), *aff’d*, 517 U.S. 370 (1996).

⁶ *Phillips*, 415 F.3d at 1315.

⁷ 35 U.S.C. § 112(f) (2018). Means-plus-function claiming is just one of many several methods of patent claiming outside of structure and method claims. See ROBERT D. FISH, *BASIC CLAIMING in WHITE SPACE PATENTING: THE INVENTORS GUIDE TO GREAT PATENT APPLICATIONS* 92–102 (2d ed. 2016) (accessible at <http://fish-ip.com/2018/01/09/basic-claiming-chapter-4>).

⁸ JANICE M. MUELLER, *PATENT LAW* 101 (4th ed. 2013).

⁹ 329 U.S. 1 (1946).

than patent law would traditionally have allowed.¹⁰ Specifically, the Court was concerned that the patent’s scope would grow beyond the scope intended by the United States Patent and Trademark Office (USPTO) to encompass other devices that could perform the same specified function claimed.¹¹

Six years later, in response to this decision, Congress enacted § 112(6) of the 1952 Patent Act, explicitly authorizing means-plus-function claiming.¹²

Section 112(6) reads:

An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.¹³

In simple terms, a means-plus-function claim consists of a function to be performed and a “means,” or structure, to perform that function that is disclosed either in the claims or in the specification. The Federal Circuit, in reviewing Congress’ intent in enacting § 112(6), reasoned in *Williamson v. Citrix Online, LLC*¹⁴ that “[i]n enacting this provision, Congress struck a balance,” allowing patentees to practice functional claiming while also “placing specific constraints on how such a limitation is to be construed, namely, by restricting the scope of coverage to only the structure, materials, or acts described in the specification as corresponding to the claimed function and equivalents thereof.”¹⁵

Following the enactment of § 112(6), approximately forty-five percent of patents issued between 1950 and 1990 contained at least one means-plus-function claim.¹⁶ However, the use of means-

¹⁰ *Id.* at 12.

¹¹ *See id.*

¹² *See In re Donaldson Co.*, 16 F.3d 1189, 1194 (Fed. Cir. 1994) (en banc) (“Congress enacted paragraph six . . . to statutorily overrule that holding [in *Halliburton*].”). “Some believe that Congressional intent in adding paragraph six was to codify the judicially created equitable doctrine of equivalents. Alternatively, it may be that Congress was merely bowing to the pressure of interested parties such as industry and patent attorneys seeking to maintain the viability of functional claims.” Scott G. Ulbrich, *Festo, Notice and the Application of Prosecution History Estoppel to Means-Plus-Function Claim Limitations*, 28 WM. MITCHELL L. REV. 1165, 1169–70 (2002). The Pre-America Invents Act (AIA) § 112(6) version and the post-AIA § 112(f) are identical. *Compare* 35 U.S.C. § 112(6) (2008) *and* 35 U.S.C. § 112(f) (2018). This Comment will generally refer to the statute as § 112(f), citing only to § 112(6) when referring to pre-AIA caselaw.

¹³ 35 U.S.C. § 112(6) (2008).

¹⁴ 792 F.3d 1339, 1347 (Fed. Cir. 2015).

¹⁵ *Id.* at 1347–48 (citing *Northrop Grumman Corp. v. Intel Corp.*, 325 F.3d 1346, 1350 (Fed. Cir. 2003)).

¹⁶ Dennis Crouch, *The Frequency of Means-Plus-Function Claims*, PATENTLY-O (July 25, 2011), <http://patentlyo.com/pat-ent/2011/07/the-frequency-of-means-plus-function-claims.html>.

plus-function claims has since declined.¹⁷ In the last decade, fewer than ten percent of patents have included a means-plus-function claim.¹⁸ This trend is associated with the decision *In re Donaldson Co.*,¹⁹ which resolved a tension between the court’s construction of means-plus-function claims and the USPTO’s prosecution of the same.²⁰ *Donaldson* held that a “means” is “limited to the corresponding structure disclosed in the specification and equivalents thereof,” narrowing the scope of functional claims considerably at the time.²¹

Recently, however, some practitioners attribute the decline to patentees’ desire to avoid challenges of indefiniteness and, ultimately, patent invalidity.²² Specifically, practitioners fear that the § 112(f) analysis will be applied against the claim even though functional claiming was unintentional. If the patentee intended to use functional claiming, they would have certainly disclosed some structure. Thus, practitioners fear when the court, on a post-issue challenge of the patent, later finds that the patent recites function without structure and renders the patent invalid. One author frames this shift in invalidity as the court’s shift from a function-versus-structure analysis to a generic-structure-versus-specific-structure determination.²³

What are the benefits of means-plus-function claiming? Claims written this way allow the patentee to describe their invention in terms of a “step” or “means” for performing a specified function without limiting the patent scope to the specific structures disclosed in the patent for performing that function. Means-plus-function claiming is beneficial because it allows patentees “to express those elements that can be performed by many different types of structures or

¹⁷ See Dennis Crouch, *Functional Claim Language in Issued Patents*, PATENTLY-O (Jan. 23, 2014), <https://patentlyo.com/patent/2014/01/functional-language-patents.html>.

¹⁸ *Id.*; Crouch, *supra* note 16.

¹⁹ 16 F.3d 1189 (Fed. Cir. 1994).

²⁰ *Id.* at 1194 (holding that the PTO could no longer ignore the statutory mandate of applying § 112(6) when triggered by ‘means’ during prosecution despite the PTO’s longstanding practice of doing so).

²¹ *Id.* at 1195.

²² See, Eric P. Raciti, *Means Plus Function Claiming: What Does It Mean to Be a Means, When Are Means Means, and Other Meaningful Questions*, LANDSLIDE, Mar.–Apr. 2016 at 19, 21 (“The reasons for the decline are complex, but can be understood in terms of a shift in the cost-benefit calculation for means-plus-function claims following several decisions in 1996. Essentially, patent drafters came to see that using a generic noun in place of a means-plus-function recitation would avoid claim construction risks.”).

²³ See Stephen Winslow, *Means for Improving Modern Functional Patent Claiming*, 98 GEO. L.J. 1891, 1908–10 (2010) (arguing that *Aristocrat Technologies Australia Pty Ltd. v. International Game Technology*, 521 F.3d 1328 (Fed. Cir. 2008) marks a shift in the Federal Circuit’s analysis of means-plus function claims, shifting away from evaluating claims in terms of structural versus functional language and shifting to an analysis based on specific versus generic language, which better reflects the § 112(f) disclosure requirement to satisfy § 112(b) definiteness).

devices” and claim the scope of those structures or devices.²⁴ The language of the statute permits this broad scope, stating that functional claims “shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.”²⁵ Another benefit is that functional claiming does not require a patentee to “explicitly disclose[]” all of the possible structures for performing the desired function.²⁶ “In this manner a claim can cover a relatively large number of possible structures without the patent application becoming excessively detailed.”²⁷ However, as this Comment will describe, while means-plus-function claiming allows for broad claims, this broad scope comes at the high price of future invalidity challenges. For this reason, functional claiming is usually not a risk worth taking.²⁸

To illustrate a means-plus-function claim, consider this example of a chair written using structural language. The claim could be written as follows:

1. A chair comprising:
a seat having an upper and lower surface, the surface of sufficient size to support a user’s posterior;
three or more support legs, wherein each said support leg has an upper end and a lower end, and the upper end is attached to the lower surface of said seat using screws.²⁹

Now, using means-plus-function claiming, the claim for a chair could be rewritten as:

1. A chair comprising:
a seat having an upper and lower surface, the surface of sufficient size to support a user’s buttocks;
three or more support legs, wherein each said support leg has an upper end and a lower end; and
means for attaching said upper end of each support leg to the lower surface of said seat with each seat extending downwardly therefrom.³⁰

In this example, the means include any known device “described in the specification and equivalents thereof” that can be used for attaching, such as screws, bolts, adhesive, or welding.

Broad claiming allows patentees to have a broader scope of protection for their patent, affording patent owners greater protection against infringers.³¹ However, broad means-plus-function

²⁴ MUELLER, *supra* note 8, at 102.

²⁵ 35 U.S.C. § 112(f) (2018).

²⁶ MUELLER, *supra* note 8, at 102.

²⁷ *Id.*

²⁸ MORGAN D. ROSENBERG, PATENT APPLICATION DRAFTING § 2.05 (2019 ed.) (describing means-plus-function claiming as controversial).

²⁹ Adapted from AMY L. LANDERS, UNDERSTANDING PATENT LAW 400–01 (3d. ed. 2012).

³⁰ Adapted from ROSENBERG, *supra* note 28, at § 2.05.

³¹ “[T]he broader the scope, the larger the number of competing products and processes that will infringe the patent.” Robert P. Merges & Richard R. Nelson, *On the Complex Economics of Patent Scope*, 90 COLUM. L. REV. 839, 839, 875 (1990) (arguing broad patents disincentivize innovation).

claiming risks an indefiniteness challenge under 35 U.S.C. § 112(b), which may render the claim invalid.³² Indefiniteness is the number one defense raised against a means-plus-function claim in litigation.³³ In 2016, two professors published a study investigating the areas of patentable subject matter most often found indefinite by the Federal Circuit.³⁴ They found that the Federal Circuit was most likely to challenge means-plus-function claims, even when controlling for subject matter. In cases where § 112(f) was invoked, the court was more likely to analyze the claim for indefiniteness, regardless of the underlying subject matter of the patent.³⁵

The current state of functional claiming is an issue for inventors because patent claims often trigger a means-plus-function analysis, even though the language of the patent did not use obvious functional claiming. Courts and challengers often interpret ambiguous claims as functional by reading these claims with a fine-tooth comb, looking for any recitation of function without means.³⁶ This creates problems for writers of unintentional means-plus-function claims,

³² In the special case of functional claims, when the specification fails to recite a sufficient structure to carry out the specified function in the claim, then the patent “necessarily lacks an adequate written description” under § 112(a) because the inventor has not disclosed exactly what the invention is. MPEP § 2163 (9th ed. Rev. Jan. 2018). So, a means-plus-function claim that does not recite adequate structure not only falls under indefiniteness under § 112(b) but also fails the written description requirement under § 112(a).

³³ John R. Allison & Lisa Larrimore Ouellette, *How Courts Adjudicate Patent Definiteness and Disclosure*, 65 DUKE L.J. 609, 645 (2016) (finding that of the 1144 cases involving § 112, 673 cases involved the issue of definiteness).

³⁴ *See generally id.*

³⁵ *Id.* at 668–69. This study ran regressions of different types of patented technology to see if there was an area of technology that was more likely to be found indefinite than others. In doing this study, the authors controlled for means-plus-function claims. In a secondary finding, they found that means-plus-function claims were more likely challenged as indefinite. The results “reveal[ed] that a claim with a [means-plus-function] element was far more likely to succumb to an indefiniteness challenge (p<0.001).” *Id.* at 655. They postulated that this result might have been due to the court’s recent holding in *Aristocrat* requiring algorithms to be provided in the case of computer-implemented functions. *Id.* *See Aristocrat Techs. Austl. Pty Ltd. v. Int’l Game Tech.*, 521 F.3d 1328, 1338 (Fed. Cir. 2008) (holding that, at a minimum, a software patent must disclose the algorithm which transforms a general purpose microprocessor to a special purpose computer). However, the study found that this was not related to the *Aristocrat* decision, finding no significant change in the number of challenges to software patents pre- and post-*Aristocrat*. Allison & Ouellette, *supra* note 33, at 655–56.

³⁶ The inventor’s intent does not matter; rather, at the litigation stage, only what is within the four corners of the patent should be considered when determining scope. *Howmedica Osteonics Corp. v. Wright Med. Tech., Inc.*, 540 F.3d 1337, 1347 (Fed. Cir. 2008) (“[I]nventor testimony as to the inventor’s subjective intent is irrelevant to the issue of claim construction.”); *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 985 (Fed. Cir. 1995) (en banc), *aff’d*, 517 U.S. 370 (1996) (“The subjective intent of the inventor

discussed below. In light of courts' willingness to read means-plus-function analysis into claims, practitioners should avoid functional claiming whenever possible.³⁷

This Comment analyzes the current landscape of means-plus-function claiming in the courts in an effort to illuminate ambiguities and unfairness in the courts' current interpretation of means-plus-function claims. The purpose of this Comment is to persuade the federal court system to reconsider its framework on means-plus-function claims and to persuade patentees to avoid functional claiming whenever possible. A critical point throughout my arguments is that in many cases, the challenge occurs after the USPTO has examined and allowed the patent. Thus, courts should not so readily interpret these claims to be subject to means-plus-function analysis and subsequently invalidate the claims. The proper presumption of patent validity must attach to the issued patent, especially in the patent realm of confusing case law and wavering burdens of proof.

Part I begins by outlining the current case law regarding the court's construction of functional claim language, briefly summarizing recent changes made by *Williamson*. Part II continues by examining two issues in the construction of means-plus-function claims. This Part highlights a tension created by two important post-*Williamson* Federal Circuit cases, *Media Rights* and *Advanced Ground*, in the court's analysis for deciding whether § 112(f) is applicable to a disputed term. Part II also discusses the tension that arises between the burden of proof for showing invalidity, clear and convincing evidence, and the burden of proof needed to invoke § 112(f), by a preponderance of the evidence. Because of the different evidentiary standards, a court's invalidation of a functional claim for indefiniteness effectively lowers the burden of proof traditionally required for invalidation. Part III reviews the benefits of means-plus-function claiming and highlights considerations that patentees should take when writing a patent in order to avoid indefiniteness caused by accidentally invoking § 112(f). This Comment will by no means cover all of the issues that *Williamson* and its progeny have created, but it will address two of the problems that I believe are resolvable in light of age-old claim construction principles.³⁸

when he used a particular term is of little or no probative weight in determining the scope of a claim.”) (citation omitted).

³⁷ Nicholas R. Mattingly, *Avoiding Invocation of Functional Claim Language in Computer-Implemented Inventions*, IPWATCHDOG (June 18, 2015), <http://www.ipwatchdog.com/2015/06/18/avoiding-invocation-of-functional-claim-language-in-computer-implemented-inventions/id=58803/>.

³⁸ For additional reading on functional claiming issues see Doris Johnson Hines & Andrew G. Strickland, *The Future of Functional Claiming, Part 1: Practical Implications of the Williamson Decision for Software Patents*, FINNEGAN (Oct. 2015), <https://www.finnegan.com/en/insights/the-future-of-functional-claiming-part-1-practical-implications.html> [hereinafter *The Future of Functional Claiming, Part 1*] and Doris Johnson Hines & Andrew G. Strickland, *The Future of Functional Claiming Part 2: Unanswered Questions Raised by the Williamson Opinion*, FINNEGAN (Nov. 2015),

I. Current Analysis of Means-Plus-Function Claims

Since *Halliburton*, the Supreme Court has not reviewed functional claiming in any substantive manner. The Federal Circuit is responsible for the heavy lifting in the patent world³⁹ and deals with the bulk of means-plus-function issues. The most recent of these cases is *Williamson v. Citrix Online, LLC*,⁴⁰ decided in June 2015. Prior to *Williamson*, *Lighting World Inc. v. Birchwood Lighting, Inc.* established a strong presumption against construing a term under § 112(f) whenever the word “means” was not used in the claim.⁴¹ Eight years later, the Federal Circuit doubled down on the heightened burden created by *Lighting World* in *Flo Healthcare Solutions, LLC v. Kappos*, stating, “[w]hen the claim drafter has not signaled his intent to invoke § 112, ¶ 6 by using the term ‘means,’ we are unwilling to apply that provision without a showing that the limitation essentially is devoid of anything that can be construed as structure.”⁴²

<https://www.finnegan.com/en/insights/the-future-of-functional-claiming-part-2-unanswered-questions.html> [hereinafter *The Future of Functional Claiming Part 2*].

³⁹ See generally Glynn S. Lunney Jr, *Patent Law, the Federal Circuit, and the Supreme Court, A Quiet Revolution*, 11 SUP. CT. ECON. REV. 1, 17–39 (2003) (discussing the “doctrinal changes” the Federal Circuit has been making in light of the Supreme Court’s silence on patent law). Though the Federal Circuit is the main interpreter of means-plus-function case law, it is not the only body practitioners need to be wary of. The USPTO, responsible for examining and issuing patents has its own framework for analyzing functional claims, though it will not be addressed here. See generally Sam Silverberg, *The Patent and Trademark Office Clashes with the Federal Circuit Over Means Plus Function*, 74 J. PAT. & TRADEMARK OFF. SOC’Y 675 (1992). With the murky waters of functional claiming, the USPTO called for additional training for examiners on § 112(f) in 2015. U.S. PATENT & TRADEMARK OFF., *USPTO-led Executive Actions on High Tech Patent Issues* (June 2, 2015), <https://www.uspto.gov/patent/initiatives/uspto-led-executive-actions-high-tech-patent-issues#heading-3>; Press Release, The White House, FACT SHEET: White House Task Force on High-Tech Patent Issues (June 4, 2013), <https://obamawhitehouse.archives.gov/the-press-office/2013/06/04/fact-sheet-white-house-task-force-high-tech-patent-issues> (“Tightening Functional Claiming. The AIA made important improvements to the examination process and overall patent quality, but stakeholders remain concerned about patents with overly broad claims — particularly in the context of software. The PTO will provide new targeted training to its examiners on scrutiny of functional claims and will, over the next six months develop strategies to improve claim clarity, such as by use of glossaries in patent specifications to assist examiners in the software field.”). For the list of Examiner trainings on means-plus-function, see U.S. PATENT & TRADEMARK OFF., *Examination Guidance and Training Materials*, <https://www.uspto.gov/patent/laws-and-regulations/examination-policy/examination-guidance-and-training-materials> (last updated Mar. 27, 2018).

⁴⁰ *Williamson v. Citrix Online, LLC*, 792 F.3d 1339 (Fed. Cir. 2015).

⁴¹ See *Lighting World, Inc. v. Birchwood Lighting, Inc.*, 382 F.3d 1354, 1358 (Fed. Cir. 2004) (“[T]he presumption flowing from the absence of the term ‘means’ is a strong one that is not readily overcome.”).

⁴² 679 F.3d 1367, 1374 (Fed. Cir. 2012).

In *Williamson*, Federal Circuit Judge Richard Linn, joined by twelve judges in relevant part, overruled the heightened burden created by *Lighting World*, calling the burden an “unjustified” thumb on the scale.⁴³ The court found that the heightened burden established an unfair presumption against finding a functional claim, thus allowing patent drafters to use “a proliferation of functional claiming untethered to § 112, para. 6[,] free of the strictures set forth in the statute.”⁴⁴ In other words, by setting the burden unbearably high for a challenger to show that a claim had been written in functional language, the *Lighting World* decision allowed claims to be written in functional language, free from the risks of indefiniteness challenges.

The *Williamson* court did not elaborate on what it meant by an “unjust” burden, however, it appears that the Federal Circuit realized that patent drafters were taking advantage of the *Lighting World* burden by writing claims that were broader than allowable. Thus, *Williamson* overruled the line of case law from *Lighting World* that placed a “strong” presumption that means-plus-function does not apply when the claim language does not use the word “means.”⁴⁵ In light of the court’s return to the pre-*Lighting World* presumption, a study found that the court was more likely to invoke § 112(f) against claims that did not recite “means” post-*Williamson*.⁴⁶

⁴³ *Williamson*, 792 F.3d at 1349.

⁴⁴ *Id.*

⁴⁵ Because of the heightened burden created in *Lighting World*, the cases between *Lighting World* and *Williamson* must be used carefully. *Tech. Licensing Corp. v. Blackmagic Design Pty Ltd.*, No. C 13-05184 SBA, 2016 WL 8902602, at *13 (N.D. Cal. Nov. 23, 2016) (holding that pre-*Lighting World* cases *Apex Inc. v. Raritan Comput., Inc.*, 325 F.3d 1364 (Fed. Cir. 2003) and *Linear Tech. Corp. v. Impala Linear Corp.*, 379 F.3d 1311 (Fed. Cir. 2004) remain good law, whereas “*Lighting World* and its progeny represent a detour”). Judge Reyna concurred in relevant part with the en banc *Williamson* decision, however, he expressed noteworthy views in his concurrence. Judge Reyna reasoned that the court did not go far enough in its reevaluation of § 112, ¶ 6, stopping at the analysis of the word “means” where the court had an opportunity to provide further clarity. *Williamson*, 792 F.3d at 1356–57 (Reyna, J., concurring-in-part, dissenting-in-part). He continued, stating that the presumption created by “means” should also apply in the case of “step” because step also appears in the text of the statute. *Id.* at 1357. It appears that he would apply means-plus-function limitations more broadly to any claim using functional claiming. Judge Newman’s dissent is also noteworthy. In his dissent, Judge Newman would have kept the strong presumption under *Lighting World*. *Id.* at 1358 (Newman, J., dissenting). Judge Newman argued that overruling *Lighting World* would merely create “additional uncertainty of the patent grant, confusion in its interpretation, invitation to litigation, and disincentive to patent-based innovation.” *Id.* The most compelling reason to side with Judge Newman is the fact that “patent applicants know how to invoke paragraph 6 if they choose” by reciting the word “means.” *Id.*

⁴⁶ See Shong Yin, *Williamson v. Citrix Online: A Fundamental Shift and Return to Form in Means-Plus-Function Interpretation*, 31 BERKELEY TECH. L.J. 687, 707–09 (2016) (finding post-*Williamson*, district courts were twenty percent more likely to invoke § 112(f) against a non-“means” reciting claim).

A. The Framework

This Subpart gives a brief overview of courts’ analysis when § 112(f) is asserted against a claim term in claim construction. The purpose of claim construction is to determine the scope of a patent so that the court or jury may determine whether an accused product in fact infringes the patent.⁴⁷ Construing a means-plus-function claim consists of a preliminary determination that a claim term is subject to means-plus-function claiming, followed by a two-step process that involves (1) determining the claimed function(s), and (2) determining the structure(s) that correspond to those function(s).⁴⁸

1. Preliminary Determination: Is the Claim Subject to § 112(f) Interpretation?

The initial question is whether the claim language is subject to means-plus-function analysis under § 112(f) at all.⁴⁹ “Means-plus-function claiming applies only to purely functional

⁴⁷ *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 985 (Fed. Cir. 1995) (en banc), *aff’d*, 517 U.S. 370 (1996); *Scripps Clinic & Research Found. v. Genentech Inc.*, 927 F.2d 1565 (Fed. Cir. 1991). Claim construction “is simply a way of elaborating the normally terse language of the claims, in order to understand and explain, but not to change, the scope of the claims.” ROBERT L. HARMON ET AL., PATENTS AND THE FEDERAL CIRCUIT 391 (13th ed. 2017).

⁴⁸ Some circuit panels characterize the two steps as (1) determining whether the claim “is in means-plus-function form pursuant to 35 U.S.C. § 112, ¶ 6” and (2) after determining that the claim is subject to means-plus-function claiming then identifying the function and corresponding structure. *See, e.g.*, *Advanced Ground Info. Sys., Inc. v. Life360, Inc.*, 830 F.3d 1341, 1346, 1348–49 (Fed. Cir. 2016). Other panels characterize the analysis as a preliminary determination of whether § 112(f) applies and then a two-step process of first identifying the recited functions and then second determining the corresponding structures. *See, e.g.*, *Noah Sys., Inc. v. Intuit Inc.*, 675 F.3d 1302, 1311 (Fed. Cir. 2012); *Williamson*, 792 F.3d at 1350–51. Tracing back to the origins of the “two-step” leads us back to *Omega Engineering, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1321 (Fed. Cir. 2003), which cites to *Micro Chemical, Inc. v. Great Plains Chemical Co., Inc.*, 194 F.3d 1250, 1258 (Fed. Cir. 1999) for this proposition. Because the *Noah/Williamson* formulation is more consistent with prior Federal Circuit formations, this Comment will follow *Williamson*’s recitation and numbering of the steps.

⁴⁹ *Williamson*, 792 F.3d at 1348. The Federal Circuit’s framework closely follows the USPTO’s three prong analysis in determining if § 112(f) applies:

- (A) the claim limitation uses the term ‘means’ or ‘step’ or a term used as a substitute for ‘means’ that is a generic placeholder (also called a nonce term or a non-structural term having no specific structural meaning) for performing the claimed function;
- (B) the term ‘means’ or ‘step’ or the generic placeholder is modified by functional language, typically, but not always linked by the transition word ‘for’ (e.g., ‘means for’) or another linking word or phrase, such as ‘configured to’ or ‘so that’; and
- (C) the term ‘means’ or ‘step’ or the generic placeholder is not modified by sufficient structure, material, or acts for performing the claimed function.

limitations that do not provide the structure that performs the recited function.”⁵⁰ At this stage, the court simply must determine whether the preponderance of the evidence shows that the patentee has used functional language to claim their invention. Whether § 112(f) applies arises during claim construction, and is thus a question of law that is subject to de novo review on appeal;⁵¹ however, the decision may involve subsidiary fact finding that is reviewable for clear error.⁵²

a) *Use of “Means”*

Courts begin by noting the presence or absence of the word “means” in the claim language.⁵³ The use of “means” in the claim language creates a rebuttable presumption that the claim language is subject to a means-plus-function limitation.⁵⁴ Conversely, failure to use the word “means” creates a rebuttable presumption that means-plus-function does not apply.⁵⁵ Still, the Federal Circuit cautioned that “[m]erely because a named element of a patent claim is followed by the word ‘means,’ however, does not automatically make that element a ‘means-plus-function’ element The converse is also true.”⁵⁶ Therefore, simply because a claim recites the word “means” does not necessarily implicate § 112(f).⁵⁷

b) *Absence of “Means”*

The absence of the word “means” creates a presumption that § 112(f) does not apply.⁵⁸ The party asserting that § 112(f) applies can rebut the presumption by showing that the claim language either (1) “fails to recite sufficiently definite structure” or (2) “recites function without reciting sufficient structure for performing that function.”⁵⁹ In most situations, the intrinsic patent record, the prosecution history, specification, and claims, will be enough to resolve any

MPEP § 2181(I) (9th ed. Rev. Jan. 2018).

⁵⁰ *Phillips v. AWH Corp.*, 415 F.3d 1303, 1311 (Fed. Cir. 2005) (en banc) (citing *Watts v. XL Sys., Inc.*, 232 F.3d 877, 880–81 (Fed. Cir. 2000)).

⁵¹ *Markman*, 517 U.S. at 391.

⁵² *Teva Pharm. USA, Inc. v. Sandoz, Inc.*, 135 S. Ct. 831, 841–42 (2015).

⁵³ *Williamson*, 792 F.3d at 1348.

⁵⁴ *Id.* (citing *Personalized Media Commc’ns, LLC v. ITC*, 161 F.3d 696, 703–04 (Fed. Cir. 1998)).

⁵⁵ *Id.* (citation omitted).

⁵⁶ *Id.* (quoting *Cole v. Kimberly-Clark Corp.*, 102 F.3d 524, 531 (Fed. Cir. 1996)). *See also* *Greenberg v. Ethicon Endo-Surgery, Inc.*, 91 F.3d 1580, 1584 (Fed. Cir. 1996) (“We do not mean to suggest that section 112(6) is triggered *only* if the claim uses the word ‘means.’”) (emphasis added).

⁵⁷ *HARMON ET AL.*, *supra* note 47, at 454. *See also* *Skyy, Inc. v. MindGeek*, 859 F.3d 1014, 1020 (Fed. Cir. 2017) (holding that “wireless device means,” though using the word means, did not invoke § 112(6)).

⁵⁸ *Williamson*, 792 F.3d at 1348 (citing *Personalized Media*, 161 F.3d at 703–04).

⁵⁹ *Id.* at 1349 (internal quotation marks and brackets omitted) (citing *Watts v. XL Sys., Inc.*, 232 F.3d 877, 880 (Fed. Cir. 2000)).

ambiguities of a disputed claim term, such that reliance on extrinsic evidence would be improper.⁶⁰

Williamson stresses that the “essential inquiry is not merely the presence or absence of the word ‘means’ but whether the words of the claim are understood by persons [having] ordinary skill in the art [PHOSITA] to have a sufficiently definite meaning as the name for structure.”⁶¹ Thus, if a PHOSITA would recognize the claim term to connote a definite structure, then the claim would not be subject to § 112(f), and a court would deem the patentee to have used non-functional language to claim their invention.⁶²

Oftentimes, in the absence of the word “means,” this part of the fight becomes a battle of the experts. When the plain and ordinary meaning of the claim language is not readily apparent from the four corners of the patent and its intrinsic record, the court may consider “extrinsic” evidence.⁶³ Extrinsic evidence includes dictionaries, treatises in the relevant art, and expert testimony.⁶⁴ Experts deliver opinions on whether, to the extent of their knowledge, the claim language connotes a definite structure that a PHOSITA would be able to recognize.⁶⁵ Parties

⁶⁰ *Vitronics Corp. v. Conceptoronic, Inc.*, 90 F.3d 1576, 1582–83 (Fed. Cir. 1996).

⁶¹ *Williamson*, 792 F.3d at 1348 (citing *Greenberg v. Ethicon Endo-Surgery, Inc.*, 91 F.3d 1580, 1583 (Fed. Cir. 1996)). *See Greenberg*, 91 F.3d at 1583 (“What is important is . . . that the term, as the name for structure, has a reasonably well understood meaning in the art.”).

⁶² *Williamson*, 792 F.3d at 1349. *See, e.g.*, *Mass. Inst. of Tech. & Elecs. for Imaging, Inc. v. Abacus Software*, 462 F.3d 1344, 1355 (Fed. Cir. 2006) (holding “aesthetic correction circuitry,” but more specifically “circuitry,” connotes definite structure, rendering 112(6) inapplicable); *Phillips v. AWH Corp.*, 415 F.3d 1303, 1311 (Fed. Cir. 2005) (en banc) (holding a “baffle” to be a “physical apparatus” where the claim language describes baffles to “extend inwardly” and despite baffles’ having functional properties).

⁶³ *Improved Search LLC v. Microsoft Corp.*, No. CV 16-650-JFB-SRF, 2018 WL 1583975, at *5 (D. Del. Mar. 30, 2018) (“Courts may consider both intrinsic and extrinsic evidence to determine whether a claim limitation is ‘so devoid of structure that the drafter constructively engaged in means-plus-function claiming.’”) (quoting *Inventio AG v. ThyssenKrupp Elevator Ams. Corp.*, 649 F.3d 1350, 1357 (Fed. Cir. 2011)).

⁶⁴ *Phillips*, 415 F.3d at 1318. Note that the Federal Circuit has cautioned about the unreliability of extrinsic evidence, calling on courts to “keep in mind the flaws inherent in each type of evidence and assess that evidence accordingly.” *See id.* at 1318–19.

⁶⁵ *See, e.g.*, *Advanced Ground Info. Sys., Inc. v. Life360, Inc.*, 830 F.3d 1341, 1348 (Fed. Cir. 2016) (holding that the district court did not err in considering the expert testimony regarding what a PHOSITA would understand); *Williamson*, 792 F.3d at 1351 (considering the testimony of plaintiff’s expert witness on whether a “distributed learning control module” would connote structure to a PHOSITA); *Advanced Ground Info. Sys., Inc. v. Life360, Inc.*, No. 14-80651-CV-MIDDLEBROOKS, 2014 WL 12652322 at *6 (S.D. Fla. Nov. 21, 2014) (considering plaintiff’s expert’s testimony on whether a PHOSITA would have understood the claim term “CPU software” to be a structure well known in the art).

may offer expert testimony to show structure; however, “[t]he testimony of one of ordinary skill in the art cannot supplant the total absence of structure from the specification.”⁶⁶ Ultimately, the court, not the expert, makes the legal determination of whether a PHOSITA would understand a claim term to connote definite structure.⁶⁷ As one group of legal scholars explains:

[A] proper determination of whether claim limitations should be construed as [means-plus-function] limitations requires an understanding of a PHOSITA. In this situation, it is appropriate to look to extrinsic evidence, including but not limited to dictionaries, applicable scientific literature, and expert testimony to assist the trier of fact in understanding the evidence.⁶⁸

2. Means-Plus-Function Two-Step Process: Determining Function and Structure

After determining by a preponderance of the evidence that a claim is subject to § 112(f), construction of a means-plus-function claim is a two-step process.⁶⁹ “The court must first identify the claimed function.”⁷⁰ The function or functions can only be determined from the claim language itself, and the court should not import limitations of function from the specification.⁷¹ A means-plus-function claim will always recite function; the claim must recite function to have passed the threshold necessary to apply § 112(f).

Determining the function, or sometimes functions,⁷² is straightforward. Claims using the word “means” generally recite function immediately after stating “means for” or “step for.” For example, the claim language could be “means for affixing a hammer head to a wooden handle.” In this instance, the function would be “affixing a hammer head to a wooden handle.” Function

⁶⁶ *Williamson*, 792 F.3d at 1354 (citing *Noah Sys., Inc. v. Intuit Inc.*, 675 F.3d 1302, 1312 (Fed. Cir. 2012)).

⁶⁷ “But in some instances, a factual finding may be close to dispositive of the ultimate legal question of the proper meaning of the term in the context of the patent. Nonetheless, the ultimate question of construction will remain a legal question. Simply because a factual finding may be nearly dispositive does not render the subsidiary question a legal one.” *Teva Pharm. USA, Inc. v. Sandoz, Inc.*, 135 S. Ct. 831, 841–42 (2015).

⁶⁸ HARMON ET AL., *supra* note 47, at 457.

⁶⁹ *Williamson*, 792 F.3d at 1351; *Apex Inc. v. Raritan Comput., Inc.*, 325 F.3d 1364, 1372 (Fed. Cir. 2003).

⁷⁰ *Williamson*, 792 F.3d at 1351 (citing *Noah Sys.*, 675 F.3d at 1311).

⁷¹ *JVW Enter. Inc. v. Interact Accessories Inc.*, 424 F.3d 1324, 1335 (Fed. Cir. 2005); *Micro Chem., Inc. v. Great Plains Chem. Co.*, 194 F.3d 1250, 1258 (Fed. Cir. 1999); HARMON ET AL., *supra* note 47, at 444 n.259 (“The statute does not permit limitation of a means-plus-function claim by adopting a function different from that explicitly recited in the claim.”).

⁷² *Williamson*, 792 F.3d at 1351 (“Where there are multiple claimed functions . . .”).

is readily apparent from the claim language, and parties will often stipulate to the identified functions.⁷³

After identifying the recited functions, “the court must determine what structure, if any, disclosed in the specification corresponds to the claimed function.”⁷⁴ If the claim has multiple functions, “the patentee must disclose adequate corresponding structure to perform all of the claimed functions.”⁷⁵ Failure to recite adequate structure for the identified function will result in the claim’s invalidity for indefiniteness under § 112(b).⁷⁶ In addition, the structure disclosed in the specification must be clearly associated with the function recited in the claim, and the structure must be “adequate,” meaning that the structure is able to perform the specified function.⁷⁷ A structure recited in the specification qualifies as a “corresponding structure” only if the patent itself “clearly links or associates that structure to the function recited in the claim.”⁷⁸ Courts analyze the language from the perspective of a PHOSITA to determine whether a structure is clearly linked with a function.⁷⁹

II. Unresolved Issues Post-Williamson

Now that we have a baseline understanding of the analysis of a functional claim, we can look at holes in the case law and issues with the courts’ framework that exist post-*Williamson*.

A. **Applying § 112(f) in Light of Specification?**

One tension that exists between two recent cases is what evidence should be considered when making the preliminary determination of whether a claim is subject to means-plus-function claiming: should a court look at the claim language only, or the claim language in light of the specification? The two cases that highlight this tension are *Media Rights Technologies, Inc. v. Capital One Financial Corp.*⁸⁰ and *Advanced Ground Information Systems, Inc. v. Life360, Inc.*⁸¹

⁷³ A party not wanting § 112(f) to apply will often construe the claim term in accordance with § 112(f) in the alternative, should the court apply the means-plus-function analysis.

⁷⁴ *Williamson*, 792 F.3d at 1351 (citation omitted).

⁷⁵ *Id.* at 1351–52 (citation omitted).

⁷⁶ *Id.* at 1352 (citing *Noah Sys., Inc. v. Intuit Inc.*, 675 F.3d 1302, 1311–12 (Fed. Cir. 2012)). The definiteness requirement will be discussed in greater depth in Part II.B. For now, just know that means-plus-function claims without a corresponding structure are indefinite and invalid.

⁷⁷ *Id.* (citing *Noah Sys.*, 675 F.3d at 1311).

⁷⁸ *Id.* (citing *Noah Sys.*, 675 F.3d at 1311).

⁷⁹ *Id.* (citation omitted).

⁸⁰ 800 F.3d 1366 (Fed. Cir. 2015).

⁸¹ 830 F.3d 1341 (Fed. Cir. 2016).

In *Media Rights*, the earlier of the two Federal Circuit decisions, the court reviewed an appeal from the Eastern District of Virginia. The infringement claim involved a patent for preventing the use of unauthorized recordings of electronic media.⁸² The district court found that the term “compliance mechanism” was an indefinite means-plus-function term.⁸³ Even though the claim language did not use the term means, the district court found that the “language only describes how the components of invention are combined and the functions performed by the ‘compliance mechanism.’”⁸⁴ The district court determined that the patent failed to recite a structure for the identified functions because the patent was a computer-implemented function and the patent failed to recite an algorithm.⁸⁵

On appeal, the Federal Circuit reviewed the construction of “compliance mechanism” de novo. “[T]he parties dispute[d] whether the claims, read in light of the specification, only ‘recite function without reciting sufficient structure for performing that function.’”⁸⁶ The Federal Circuit answered in the affirmative, agreeing with the district court that “compliance mechanism” was a means-plus-function limitation.⁸⁷ Reading the claim language in light of the specification, or rather, reading the language in absence of language in the specification, the claim recited function but did not disclose any type of adequate structure.⁸⁸ The court applied this standard: a functional claim is indefinite if “when read *in light of the specification* and the prosecution history, [it] ‘fail[s] to inform, with reasonable certainty, those skilled in the art about the scope of the invention.’”⁸⁹ The *Media Rights* court noted that when determining whether means-plus-function analysis applies, courts should look at the claim language *in light of the*

⁸² *Media Rights*, 800 F.3d at 1368.

⁸³ *Id.*

⁸⁴ *Id.* at 1369.

⁸⁵ *Id.* at 1370. *See also* Encyclopaedia Britannica, Inc. v. Alpine Elecs., Inc., 355 F. App'x 389, 393 (Fed. Cir. 2009) (“If the algorithm is not adequately disclosed in the specification, the claim is invalid for indefiniteness.”) (citing 35 U.S.C. § 112 ¶¶ 2, 6; *Aristocrat Techs. Austl. Pty Ltd. v. Int’l Game Tech.*, 521 F.3d 1328, 1338 (Fed. Cir. 2008)); *Aristocrat*, 521 F.3d at 1336, 1338 (finding that an adequate structure for a computer-implemented function is not a computer itself but rather an algorithm and holding that the claim was invalid for failing to recite an algorithm). For a discussion on heightened requirements for software patents see Kip Werking & Alan McBeth, *A Strategy for Protecting Software Claims from Invalidation Under the Algorithm Requirement*, IP WATCHDOG (July 22, 2015), <https://www.ipwatchdog.com/2015/07/22/a-strategy-for-protecting-software-claims-from-invalidation-under-the-algorithm-requirement/id=59586>.

⁸⁶ *Media Rights*, 800 F.3d at 1372 (quoting *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1349–50 (Fed. Cir. 2015)).

⁸⁷ *Id.* at 1375.

⁸⁸ *See id.* at 1372.

⁸⁹ *Id.* at 1371 (alteration in original) (emphasis added) (quoting *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2124 (2014)).

specification, stating that “[w]ithout more, . . . the claims, when read in light of the specification, [do not] provide sufficient structure for the ‘compliance mechanism’ term.”⁹⁰

In its decision that § 112(6)⁹¹ applied to the claim term “compliance mechanism,” the *Media Rights* panel made two determinations. The first was that the claim term itself does not connote structure or alternatively that the claim language recites function without structure.⁹² The second determination was that the specification fails to disclose a clearly identifiable structure for performing the specified functions, such that the claim term does not connote structure in light of the specification.⁹³

After determining that the claim was subject to a means-plus-function limitation, the panel construed the claim term “by identifying the ‘corresponding structure, material, or acts described in the specification.’”⁹⁴ The parties stipulated to four functions performed by the compliance mechanism.⁹⁵ Revisiting the specification, the court looked at whether an adequate structure was provided for all four functions.⁹⁶ Finding that the “compliance mechanism” was a computer-implemented function, the court held that the specification failed to disclose adequate algorithms for performing three of the four functions.⁹⁷ Thus, the Federal Circuit held and affirmed that the compliance mechanism was indefinite under § 112(b).⁹⁸

Advanced Ground was an appeal from the District Court for the Southern District of Florida concerning cellular communication, whereby a user could select another user from a visual map to initiate calls or text messaging.⁹⁹ The district court determined that the claim term “symbol generator” was an indefinite functional term¹⁰⁰ because, when read in the context of the “relevant claim language,” the term only conveys functional meaning.¹⁰¹ The district court found that a PHOSITA would not understand a symbol generator to be a definite structure, as it “is not used in common parlance.”¹⁰²

⁹⁰ *Id.* at 1373.

⁹¹ Because the patent in *Media Rights* was filed before the Leahy-Smith America Invents Act (AIA) was enacted, § 112(6) applies. *See id.* at 1371 n.1.

⁹² *Id.* at 1372 (citing *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1349-50 (Fed. Cir. 2015)).

⁹³ *Id.* (citing *Robert Bosch, LLC v. Snap-On Inc.*, 769 F.3d 1094, 1099 (Fed. Cir. 2014)).

⁹⁴ *Id.* at 1374 (quoting *Robert Bosch*, 769 F.3d at 1097).

⁹⁵ *Id.*

⁹⁶ *Id.*

⁹⁷ *Id.* at 1374–75.

⁹⁸ *Id.* at 1375.

⁹⁹ *Advanced Ground Info. Sys., Inc. v. Life360, Inc.*, 830 F.3d 1341, 1344–45 (Fed. Cir. 2016).

¹⁰⁰ *Id.* at 1346.

¹⁰¹ *Id.* at 1347 (quoting the district court opinion).

¹⁰² *Id.* (quoting the district court opinion).

Advanced Ground Information Systems, Inc. (AGIS) appealed, arguing that the district court improperly determined that “symbol generator” was subject to § 112(6).¹⁰³ According to AGIS, AGIS’s expert Dr. Benjamin Goldberg purportedly testified that a PHOSITA “would have understood the claimed symbol generator to have a sufficiently definite meaning as the name for structure.”¹⁰⁴ The Federal Circuit disagreed with AGIS’s interpretation of its expert, finding that Dr. Goldberg actually testified that a symbol generator is a “coined term” for the patent.¹⁰⁵ Because the claim term was a coined term, created by the patentee specifically for the purposes of the patent, the term could not then be a known structure.¹⁰⁶ Even though the terms “symbol” and “generator” are known in the field of computer science, the combination of known terms does not in and of itself connote definite structure.¹⁰⁷ Thus, the Federal Circuit affirmed the district court’s application of § 112(6) and conclusion that “symbol generator” was indefinite.¹⁰⁸

In contrast to *Media Rights*, when determining that § 112(6) applies, the *Advanced Ground* panel did not once refer to the specification in its analysis of whether “symbol generator” connotes structure. This is consistent with the rule the *Advanced Ground* panel recites from *Williamson*: “The standard is whether *the words of the claim* are understood by [PHOSITA] to have a sufficiently definite meaning as the name for structure.”¹⁰⁹ The *Advanced Ground* panel focused on whether the claim term itself connoted structure, not on whether the term in light of the specification would be structural. Finding that “symbol generator” did not connote structure on its own, the court held that § 112(6)¹¹⁰ applied.¹¹¹

Only after determining that § 112(f) applied did the panel consider the specification and whether the specification provided corresponding structure.¹¹² In essence, the panel only analyzed whether the claim language by itself would connote structure to a PHOSITA. The panel did not consider the specification when it determined that “symbol generator” was a means-plus-

¹⁰³ *Id.*

¹⁰⁴ *Id.* (citation omitted) (“Dr. Goldberg testified that those skilled in the art would have understood a ‘symbol generator’ to refer to a well-known class of existing, available, standard modules of software code used to generate symbols on a display.”).

¹⁰⁵ *Id.* at 1348.

¹⁰⁶ *Id.*

¹⁰⁷ *Id.*

¹⁰⁸ *Id.*

¹⁰⁹ *Id.* at 1347 (emphasis added) (quoting *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1349 (Fed. Cir. 2015)).

¹¹⁰ Because the patent in *Advanced Ground* was filed before the Leahy-Smith America Invents Act (AIA) was enacted, § 112(6) applies. *See id.* at 1343 n.1.

¹¹¹ *Id.* at 1348 (“Accordingly, because the term ‘symbol generator’ does not describe anything structural, the district court was correct to conclude that the asserted claims which recite the term ‘symbol generator’ are subject to 35 U.S.C. § 112, ¶ 6.”).

¹¹² *Id.* at 1349.

function limitation simply because the words of the claim language did not recite structure. The court did not look to the specification to give the words of the claim language meaning. Rather, the court decided whether the claim term itself would connote structure to a PHOSITA, referring to expert opinion in doing so.

The *Advanced Ground* panel turned to the specification for the first time in its construction and identification of function and structure. The court stated that “we must ‘construe the disputed claim term by identifying the corresponding structure, material, or acts described in the specification to which the claim term will be limited.’”¹¹³ The Federal Circuit agreed with the district court’s determination that the specification only generally described how the symbols were generated, “fail[ing] to disclose an algorithm or description as to how those symbols are actually generated.”¹¹⁴ Thus, the specification did not recite a sufficient structure for the symbol generator.¹¹⁵ The court affirmed the invalidity of the asserted claims.¹¹⁶

I believe that the *Advanced Ground* panel’s analysis, which failed to follow *Williamson*’s framework for means-plus-function limitations, is better than the *Media Rights* analysis for means-plus-function claims. Even though *Advanced Ground* departs from the law as recited in *Williamson* and as applied in *Media Rights*, the analysis is cleaner, more easily applied, and less redundant and recursive than *Media Rights*’ application of *Williamson*. By limiting the scope of the preliminary determination to a PHOSITA’s understanding of structure, the *Advanced Ground* analysis simplifies the determination of whether § 112(f) should be applied to the claim language. A court need not scour dense patent language for structure that performs the recited functions. Further, a court need not get into the analysis of whether something identified in the specification is a definite structure itself.¹¹⁷ By contrast, a court following *Media Rights* must first identify the recited functions in order to analyze the specification for structure, resulting in a two-step analysis.

Evaluating whether the disputed claim term connotes sufficient structure by itself is less redundant than the *Media Rights* approach, which requires analyzing the specification twice for structure. Under *Media Rights*, a court first looks to the specification to determine whether the claim term is subject to § 112(f) in order to determine if the specification recites structure.¹¹⁸ The second analysis of the specification is meaningless except for the court’s final recitation that

¹¹³ *Id.* (quoting *Robert Bosch, LLC v. Snap-On Inc.*, 769 F.3d 1094, 1097 (Fed. Cir. 2014)).

¹¹⁴ *Id.* at 1349–50 (internal quotation marks and brackets omitted) (quoting the district court’s *Markman* order).

¹¹⁵ *Id.*

¹¹⁶ *Id.* at 1350.

¹¹⁷ In any case, what constitutes a definite structure may be tricky as even PHOSITAs may differ on what constitutes structure as we can see from the dueling expert reports and expert testimony.

¹¹⁸ *See Media Rights Techs., Inc. v. Capital One Fin. Corp.*, 800 F.3d 1366, 1371–73 (Fed. Cir. 2015).

the claim language is indefinite. By analyzing the specification in the preliminary determination, a court makes clear whether it believes the claim is indefinite for lack of structure.

Even though the claim language must be interpreted in light of the specification as established by the U.S. Supreme Court in *Nautilus*, this specification-interpretive step should be saved for the two-step portion of the analysis, not for the preliminary determination of whether the law applies. Determining whether § 112(f) is triggered is not a matter of claim construction per se. The purpose of claim construction is to give clearer meaning to the claim language consistent with the scope of the specification, if necessary.¹¹⁹ Deciding to construe a term as means-plus-function does not give meaning to the claim language other than clarifying that the term falls into a specific claim category.¹²⁰ Because this step does not actually construe the claim language itself by expanding on the meaning of the claim language, the step is not considered claim construction. This preliminary question merely asks whether a particular line of means-plus-function cases is applicable to the asserted claim. Whether the claim term should be construed as means-plus-function is a threshold question that should not ultimately decide definiteness. Considering the specification before concluding that the term is subject to means-plus-function

¹¹⁹ See *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 976 (Fed. Cir. 1995) (en banc), *aff'd*, 517 U.S. 370 (1996) (stating that the purpose of claim construction is to “determin[e] the meaning and scope of the patent claims asserted to be infringed”). Courts may decline to construe a term when it is unnecessary. See *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005) (en banc) (stating that the plain and ordinary meaning of claims language is often sufficient); Sarah Brooks, *Is ‘Plain and Ordinary Meaning’ a Viable Proposed Claim Construction After the Federal Circuit’s Decision in Eon?*, IPWATCHDOG (Apr. 30, 2017), <http://www.ipwatchdog.com/2017/04/30/plain-ordinary-meaning-viable-proposed-claim-construction/id=82569/>. As an aside, parties will often quote *O2 Micro International Ltd. v. Beyond Innovation Technology Co.* for the proposition that courts are required to resolve issues of patent scope at the claim construction stage. The oft cited language is: “When the parties raise an actual dispute regarding the proper scope of these claims, the court, not the jury, must resolve that dispute.” 521 F.3d 1351, 1360 (Fed. Cir. 2008). See also Peter E. Gratzinger, *After O2 Micro: The Court’s Evolving Duty to Map Words to Things*, 32 SANTA CLARA HIGH TECH. L.J. 141 (2016) (discussing how *O2 Micro* mandates claim construction for asserted terms); Jason R. Mudd, *To Construe Or Not to Construe: At the Interface Between Claim Construction and Infringement in Patent Cases*, 76 MO. L. REV. 709, 726–727 (2011) (discussing the illogical effects of *O2 Micro*). Circuit Judge O’Malley’s dissent from the denial of rehearing en banc in *NobelBiz, Inc. v. Global Connect, L.L.C.* is instructive on the damage and confusion that *O2 Micro* has created, calling for the Federal Circuit to revisit and clarify scope of the rule created in *O2 Micro*. 876 F.3d 1327–28 (Fed. Cir. 2017) (O’Malley, J., Newman, J., and Reyna, J. dissenting from the denial of rehearing en banc) (discussing the inconsistent use and application of *O2 Micro* resulting in the district courts’ construction of unnecessary claim terms, dampening judicial efficiency).

¹²⁰ Other claim types include structure, method, product-by-process, *Markush*, and *Jepson* claims. See *FISH*, *supra* note 7, at 92–102.

limitation is putting the cart before the horse. The definiteness determination should be saved for the actual interpretation in the two-step means-plus-function construction.

For clarity, at this preliminary determination step, courts should only consider a limited number of things. First, a court should consider only the claim language, not the specification, and read the claim as a whole rather than element-by-element.¹²¹ Second, the court should ask whether the claim term connotes definite structure under the plain and ordinary meaning standard.¹²² Lastly, a court should consider expert testimony concerning whether a PHOSITA in the relevant area of art would use the term “in common parlance . . . to designate structure,”¹²³ or whether the term “denotes a particular type of device with a generally understood meaning in the field.”¹²⁴

Interestingly, the *Advanced Ground* district court casually looked at the specification in determining that means-plus-function applied. The district court found that “the specification fails to mention or describe the definition of ‘symbol generator.’”¹²⁵ In analyzing the specification, the district court cited to another opinion that held that § 112(6) was invoked where the specification failed to even mention the disputed term.¹²⁶ Aside from this citation, however, the district court did not consider the specification in evaluating whether functional claiming was used. Rather, the court effectively followed the Federal Circuit by considering the plain meaning of the term and expert testimony on what a PHOSITA would understand as a definite structure.¹²⁷ The district court relied heavily on the specification only in making its

¹²¹ *Advanced Ground*, 803 F.3d at 1347; HARMON ET AL., *supra* note 47, at 416–17.

¹²² *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005) (en banc) (stating the plain and ordinary meaning of claims language is often sufficient); *Elekta Instrument S.A. v. O.U.R. Sci. Int’l, Inc.*, 214 F.3d 1302, 1309 (Fed. Cir. 2000) (“[W]e cannot construe the claim differently from its plain meaning in order to preserve its validity.”). As an aside, two professors have made a compelling argument for why the courts need not construe terms as it does not truly resolve ambiguity in the claim language; rather the courts should focus on resolving discrepancies in policy and claim construction principles. They highlight that the true issue between courts is that they “disagree about whether to construe claims according to the linguistic meaning or according to the patentee’s actual inventive idea.” *See generally* Tun-Jen Chiang & Lawrence B. Solum, *The Interpretation-Construction Distinction in Patent Law*, 123 YALE L.J. 530 (2013).

¹²³ *Lighting World, Inc. v. Birchwood Lighting, Inc.*, 382 F.3d 1354, 1359 (Fed. Cir. 2004).

¹²⁴ *Media Rights Techs., Inc. v. Capital One Fin. Corp.*, No. 13-cv-476, 2013 WL 6506176, at *9 (E.D. Va. Dec. 9, 2013), *aff’d*, 800 F.3d 1366 (Fed. Cir. 2015).

¹²⁵ *Advanced Ground Info. Sys., Inc. v. Life360, Inc.*, No. 14-8051-CV-MIDDLEBROOKS, 2014 WL 12652322 at *12 (S.D. Fla. Nov. 21, 2014), *aff’d*, 830 F.3d 1341 (Fed. Cir. 2016).

¹²⁶ *Id.* (citing *Grobler v. Apple Inc.*, 12-cv-01534, 2014 WL 1867043, at *8 (N.D. Cal. May 6, 2014)).

¹²⁷ *Id.*

indefiniteness determination.¹²⁸ I would argue that the district court and Federal Circuit analyses of symbol generator are the same.

Moreover, the district court's decision in *Media Rights* also aligns with the *Advanced Ground* framework more than the Federal Circuit's opinion does. When the district court determined that compliance mechanism triggered § 112(6), the court honed in on "the claims themselves" and whether the claim language recited structure.¹²⁹ The district court did not reference the specification when it decided to apply § 112(6).¹³⁰ It is obvious from the *Media Rights* and *Advanced Ground* district court opinions, which were later affirmed in relevant part on appeal, that courts need not engage in the convoluted exercise of interpreting the specification in order to determine whether the statute applies. The disputed claim should be considered in light of the claims, not in light of the specification.

One thing to note about the inconsistent frameworks is that the two Federal Circuit panels consisted of entirely different judges. *Media Rights* was decided by Circuit Judges Kathleen O'Malley, S. Jay Plager, and Richard G. Taranto,¹³¹ whereas *Advanced Ground* was decided by Kimberly A. Moore, Haldane Robert Mayer, and Evan J. Wallach.¹³² It is unclear why the *Advanced Ground* decision was inconsistent from *Media Rights* and *Williamson* even though the *Advanced Ground* panel cited to both cases. Perhaps this area of law is confusing to the Federal Circuit.

In the Federal Circuit's next consideration of means-plus-function claiming, the court ought to revisit its framework for analyzing functional claims in order to resolve the analysis discrepancy. District courts can only analyze as clearly as the circuit courts. Judge Pauline Newman's dissent in *Williamson* is correct to note that there are many issues to resolve regarding functional claiming,¹³³ and perhaps it is time to retire § 112(f).

B. Unclear Evidentiary Standard for Invoking § 112(f)

Whether a claim is definite is a question of law.¹³⁴ The purpose of the definiteness requirement of § 112(b) is to ensure that the claims are written to give the public notice of the scope of the

¹²⁸ See *id.* at *13–*23.

¹²⁹ See *Media Rights*, 2013 WL 6506176, at *10–*11.

¹³⁰ See *id.* at *3 (implicating § 112(6) upon only focusing on the claim language).

¹³¹ *Media Rights Techs. v. Capital One Fin. Corp.*, 800 F.3d 1366, 1368 (Fed. Cir. 2015).

¹³² *Advanced Ground Info. Sys. Inc.*, 830 F.3d 1341, 1343 (Fed. Cir. 2016).

¹³³ *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1358–63 (Fed. Cir. 2015) (Newman, J., dissenting) (arguing that the majority's decision ignores the patentee's intent, leaving the invocation of § 112(f) to "arbitrary judicial subjectivity").

¹³⁴ *Dow Chemical Co. v. Nova Chemicals Corp. (Can.)*, 809 F.3d 1223, 1224–25 (Fed. Cir. 2015) (Moore, J., concurring in the denial of the petition for rehearing en banc).

patent so that other parties may be able to determine whether they would infringe the patent.¹³⁵ A claim is definite if a PHOSITA would be able to ascertain the “bounds” of a patent’s scope.¹³⁶ Claims must “clearly and precisely define the metes and bounds of the claimed invention.”¹³⁷ The claim places the public on notice of the scope of the patentee’s right to exclude. Definiteness is a protectionary measure for third parties, putting them on notice of the patent owner’s property right to exclude, thus protecting third parties from the uncertainty of the patent’s scope.¹³⁸ Conversely, a patent is indefinite if a PHOSITA would not be able to determine “with reasonable certainty . . . the scope of the invention.”¹³⁹

Ordinarily, a challenger seeking to invalidate a claim for indefiniteness must show that the claim is indefinite by clear and convincing evidence.¹⁴⁰ Issued patents are presumed valid and in compliance with the § 112(b) requirements, including definiteness.¹⁴¹ Accordingly, any challenge of indefiniteness in a means-plus-function claim must demonstrate, by clear and convincing evidence, that the specification does not disclose definite structure for the recited function.¹⁴² This high burden of evidence is in tension with the fact that a court need only find that a claim is subject to a means-plus-function limitation by a preponderance of the evidence.¹⁴³

A court’s determination that means-plus-function applies to an unintentional functional claim signals the death knell and invalidity of the claim.¹⁴⁴ In recent Federal Circuit cases on appeal

¹³⁵ All Dental Prodx, LLC v. Advantage Dental Prods., Inc., 309 F.3d 774, 779-80 (Fed. Cir. 2002).

¹³⁶ HARMON ET AL., supra note 47, at 364.

¹³⁷ MPEP § 2173.02 (9th ed. Rev. Jan. 2018).

¹³⁸ *Id.*; HARMON ET AL., supra note 47, at 364.

¹³⁹ Nautilus, Inc. v. Biosig Instruments, Inc., 134 S. Ct. 2120, 2124 (2014).

¹⁴⁰ Dow Chemical Co. v. Nova Chemicals Corp. (Can.) 809 F.3d 1223, 1227 (Fed. Cir. 2015) (Moore, J., concurring in the denial of rehearing en banc).

¹⁴¹ HARMON ET AL., supra note 47, at 43, n. 215 (“Because the claims of a patent are afforded a statutory presumption of validity, a challenge to a claim containing a [means-plus-function] limitation as lacking structural support requires a finding, by clear and convincing evidence, that the specification lacks disclosure of structure sufficient to be understood by a PHOSITA as being adequate to perform the recited function.”).

¹⁴² TecSec, Inc. v. Int’l Bus. Machines Corp., 731 F.3d 1336, 1349 (Fed. Cir. 2013) (“The party alleging that the specification fails to disclose sufficient corresponding structure must make that showing by clear and convincing evidence.”).

¹⁴³ Apex Inc. v. Raritan Comput., Inc., 325 F.3d 1364, 1372 (Fed. Cir. 2003) (citing A.C. Aukerman Co. v. R.L. Chaides Constr. Co., 960 F.2d 1020, 1045 (Fed. Cir. 1992)).

¹⁴⁴ Keep in mind, that in making this argument I do not consider intentional functional claims, as intentional functional claiming would certainly disclose adequate structure and thus are unlikely to be invalidated by the court. With this new line of cases advancing the “nonce” word invoking of functional claiming, in contrast with the “means” signal, determining when means-plus-function will be applied is now even less predictable. See generally Williamson v. Citrix Online, LLC, 792 F.3d 1339, 1350 (Fed.

for means-plus-function claim construction, the only claims that were not invalidated were the claims in which the Federal Circuit found that § 112(f) was improperly applied. For example, the Federal Circuit has reversed the district courts' finding that § 112(f) applied where (1) the specification provided adequate structure that the district court did not consider in its determination,¹⁴⁵ and (2) the district courts improperly relied on unsupported and conclusory arguments by a party arguing that the claim did not sufficiently recite definite structure.¹⁴⁶

There is no middle ground. For claims that do not recite means, no court has determined that the claims were definite after applying § 112(f).¹⁴⁷ It is either § 112(f) does not apply and the claim survives the indefiniteness challenge, or § 112(f) does apply and the claim is invalidated for lack of structure. This burden of proof creates an issue for patents where means-plus-function signaling language is not clearly present.

By simply establishing that a claim is subject to a means-plus-function limitation by a preponderance of the evidence, rebutting the even-handed burden created by *Williamson*, a challenger has a free pass to invalidate the claim under a lower standard whereas invalidity requires clear and convincing evidence. If a challenger can provide any evidence or argument that a claim should be subject to means-plus-function claiming, the challenger has cleared the path to invalidity. By deferring to expert testimony in determining that § 112(f) applies, a court relinquishes its role as the legal interpreter of claims.¹⁴⁸ In making the preliminary determination

Cir. 2015); *Robert Bosch, LLC v. Snap-On Inc.*, 769 F.3d 1094, 1099 (Fed. Cir. 2014); *Secured Structures, LLC v. Alarm Sec. Grp., LLC*, No. 6:14CV930, 2016 WL 7552624, at *6–*8 (E.D. Tex. Aug. 9, 2016) (considering whether the claim term at issue was “remarkably similar” to the claim term in *Williamson* or “remarkably similar” to the term in *Inventio*, using comparison of claim language to determine invalidity); *Raciti*, *supra* note 22, at 23 (“The impact of the *Robert Bosch* and *Williamson* decisions will place the burden on patent drafters, but in a less predictable way than might be hoped for.”).

¹⁴⁵ See, e.g., *VocalTag Ltd. v. Agis Automatisering B.V.*, 659 F. App'x 616, 620–21 (2016) (“We agree with VocalTag that the district court erred by excluding the Figure 6 algorithm as corresponding structure. . . . [T]he Figure 6 algorithm provides corresponding structure for the claimed function of the ‘data processor.’”).

¹⁴⁶ See, e.g., *Zeroclick, LLC v. Apple Inc.*, 891 F.3d 1003, 1008 (Fed. Cir. 2018) (“The district court’s [determination] . . . is couched in conclusory language. The court relied on Apple’s arguments . . . but pointed to no record evidence that supported its ultimate conclusion [that § 112(6) applied].”).

¹⁴⁷ This applies equally for claims that do not use another nonce word like “module,” “mechanism,” “element,” and “device.” See *Williamson*, 792 F.3d at 1350; *Mass. Inst. of Tech. & Elecs. For Imaging, Inc. v. Abacus Software*, 462 F.3d 1344, 1354 (Fed. Cir. 2006); MPEP § 2181 (9th ed. Rev. Jan. 2018); Gene Quinn, *A Primer on Indefiniteness and Means Plus Function*, IPWATCHDOG (Nov. 15, 2017), <https://www.ipwatchdog.com/2017/11/15/primer-indefiniteness-means-plus-function/id=89708/>.

¹⁴⁸ The *Advanced Ground* patentee fared no better as the court held that the claims were still invalid for indefiniteness. However, *Advanced Ground* provides a clearer and separate framework, allowing the

by a preponderance of the evidence under the *Media Rights/Williamson* framework, a court effectively determines that the patent lacks adequate structure and thus decides that the claim is invalid for indefiniteness.¹⁴⁹ A challenger is therefore improperly released from its duty to show invalidity by clear and convincing evidence, and the presumption of the issued patent's validity is lost.¹⁵⁰

The Federal Circuit must acknowledge the tension between a challenger's burden to show that means-plus-function claiming applies by the preponderance of the evidence and the challenger's duty to demonstrate indefiniteness by clear and convincing evidence. The court should clarify why it accepts expert testimony on structure as true despite the presumption of validity of the

preliminary determination to be made by a preponderance of the evidence while ensuring that the two-step and determination of indefiniteness is done by clear and convincing evidence. See *Advanced Ground Info. Sys. Inc.*, 830 F.3d 1341, 1344 (Fed. Cir. 2016).

¹⁴⁹ Two attorneys highlight the tension of burden of proof and the circuit's pre-*Lightning World* return succinctly when they write: "If a court uses the clear and convincing standard to determine both Section 112(6) applicability and invalidity for a claim element, it would apply a standard of proof inconsistent with *Williamson*'s holding that the Section 112(6) presumption is not strong. On the other hand, if the court uses a preponderance of evidence standard to determine the applicability of Section 112(6) and invalidity for a claim element, it will invalidate a claim under a lower standard than the law allows." *The Future of Functional Claiming Part 2*, *supra* note 38.

¹⁵⁰ Another interesting evidentiary question in this area of law is the role of expert testimony in determining whether § 112(f) is invoked. Claim construction under *Markman* is a matter of law. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 980 (Fed. Cir. 1995) (en banc), *aff'd*, 517 U.S. 370 (1996). However, in its preliminary determination, the court often considers expert testimony as evidence of whether a PHOSITA would understand the claim language to convey definite structure. In accepting a party's expert testimony regarding adequate structure as true, the court effectively accepts the party's construction of the term as well. *Williamson*, 792 F.3d at 1348. This factual finding, reviewable only for clear error, is dispositive for claim construction which is subject to de novo review on appeal. It is well understood in claim construction cannon that expert testimony cannot change the scope of the patent claims. See *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1584 (Fed. Cir. 1996) ("[E]xpert testimony in particular[] may be used only to help the court come to the proper understanding of the claims; it may not be used to vary or contradict the claim language."). For a discussion on the proper role of experts in claim construction see MASCHOFF BRENNAN, *Is the Role of the Expert Witness in Claim Construction Changing?*, (Apr. 1, 2016), <http://mabr.com/is-the-role-of-the-expert-witness-in-claim-construction-changing/>. To solve this issue, I would urge the courts to ensure that their construction of means-plus-function claims be supported by intrinsic evidence, rather than solely relying on expert testimony to determine proper construction. However, the courts may disagree with my contentions as dispositive factual findings are still properly considered to be "legal" determinations. See *Teva Pharm. USA, Inc. v. Sandoz, Inc.*, 135 S. Ct. 831, 841–42 (2015) ("But in some instances, a factual finding may be close to dispositive of the ultimate legal question of the proper meaning of the term in the context of the patent. Nonetheless, the ultimate question of construction will remain a legal question.").

patent. Issued patents should be given their proper weight in light of arguments raised by challengers, and expert testimony must be clear and convincing when invalidity is on the line.

III. Why Use Functional Claiming?

After reviewing the current patent case law that could create confusion for practitioners, why would a patentee use functional claiming in the first place? “The complexity of infringement of [means-plus-function] claims may leave patent practitioners wondering whether [means-plus-function] claim elements should be used at all.”¹⁵¹ Patent drafters advise against using means-plus-function claims because of the indefiniteness trap.¹⁵² And very few authors sing means-plus-function’s praises.¹⁵³ However, means-plus-function claiming has a time and place and is often unavoidable, such as with software patenting.¹⁵⁴ As noted in an earlier footnote, practitioners do not have to worry about situations where they have clearly and intentionally invoked § 112(f), as those claims, if written well, are unlikely to be invalidated in comparison to claims that do not recite “nonce” words.¹⁵⁵ Again, it is the unintentional functional claiming that causes trouble.

¹⁵¹ Jonas Hodges, *Infringement of Means-Plus-Function Claims*, 87 J. PAT. & TRADEMARK OFF. SOC'Y 175, 205 (2005).

¹⁵² Seema Mehta & Jonathan Osha, *Functional Claim Language: The Indefiniteness Trap*, OSHA LIANG (May 5, 2017), <https://oshaliang.com/newsletter/functional-claim-language-the-indefiniteness-trap>; James Yang, *Claim Drafting Tip: Avoid Means Plus Function Claims*, OC PATENT LAWYER (Nov. 23, 2015), <https://ocpatentlawyer.com/claim-drafting-tip-avoid-means-plus-function-claims>.

¹⁵³ See, e.g., “The general impression imparted on practitioners (particularly those outside the United States) by these cases and related commentary has been that Means claims are something to be feared, akin to a Trojan horse.” Gregory J. Maier & Bradley D. Lytle, *The Strategic Use of Means-Plus-Function Claims*, 80 J. PAT. & TRADEMARK OFF. SOC'Y 241, 243, 249 (1998) (conceding that most practitioners approach means-plus-function claims with “extreme caution” and yet arguing that means-plus-function claims have their advantages).

¹⁵⁴ “Functional claim language is increasingly being used by practitioners to capture the metes and bounds of an invention, especially in computer-implemented inventions. Sometimes using functional language in a claim limitation is unavoidable. There is nothing inherently wrong with defining some part of an invention in functional terms; however, using functional claim language carries some risks.” Mattingly, *supra* note 37. Professor Crouch argues that functional claiming should be avoided at all costs, even for software patents. See Dennis Crouch, *Means Plus Function Claiming*, PATENTLY-O (Jan. 14, 2013), <https://patentlyo.com/patent/2013/01/means-plus-function-claiming.html> (arguing against the use of means-plus-function to interpret software because “[i]n all likelihood this would severely limit the scope of many software related patents and would also lead many of them to be invalidated under means-plus-function for indefiniteness.”).

¹⁵⁵ “Thus, more than anything else, avoiding ‘accidental’ interpretations under §112(f) where careful thought has not been given to the supporting disclosure is highly important.” Mehta & Osha, *supra* note

Functional claiming allows a patentee to have broad coverage over various methods of performing a function without limiting the claim to a specific means or structure for performing that function.¹⁵⁶ Means-plus-function claims are statutorily entitled to the equivalent scope of the structures disclosed in the specification.¹⁵⁷ In theory, means-plus-function can be broader than direct claiming of a specific structure because functional claiming not only encompasses equivalents thereof but also equivalents under the doctrine of equivalents.¹⁵⁸ Note that the scope of the doctrine of equivalents is different than that of literal infringement of the means-plus-function claim.¹⁵⁹

Functional claiming allows practitioners to avoid the “excessive detail” of having to provide every possible structure that can perform the identified function.¹⁶⁰ By drafting claims using means-plus-function language, all of the disclosed embodiments are covered by the functional language, such that the patentee does not have to individually claim each embodiment.¹⁶¹ “Means plus function claiming is an excellent way to make sure that you have captured within the claims all of the various means disclosed in the application.”¹⁶²

Writing and paying for each structural claim can be costly.¹⁶³ By using functional claiming and adequately disclosing structure in the specification, the patentee can avoid paying for extra claims to cover the scope of multiple structures to perform the same function.¹⁶⁴

Patentees ought to double and triple check their claim language to see if functional language has been used, especially gerunds and “nonce” words that are not supported by structure in the

152 (advising that if an inventor wants to use functional claiming, one approach is to simply embrace using means-plus-function form).

¹⁵⁶ 35 U.S.C. § 112(f) (2018).

¹⁵⁷ *Id.*

¹⁵⁸ *See D.M.I., Inc. v. Deere & Co.*, 755 F.2d 1570, 1574 (Fed. Cir. 1985) (holding that under the doctrine of equivalents that the functional claim was not limited only to the embodiments in the specification). *See generally* Charles W. Bradley, *Means-Plus-Function Clauses in Patent Claims: A Tortuous Path*, 33 RUTGERS COMPUTER & TECH. L.J. 1 (2006).

¹⁵⁹ *ACTV, Inc. v. Walt Disney Co.*, 346 F.3d 1082, 1093 (Fed. Cir. 2003) (citing *Apex Inc. v. Raritan Comput., Inc.*, 325 F.3d 1364, 1378 (Fed. Cir. 2003)); *Lockheed Martin Corp. v. Space Systems/Loral, Inc.*, 324 F.3d 1308, 1320, (Fed. Cir. 2003) (“An accused structure that does not literally infringe a means-plus-function claim may nevertheless infringe under the doctrine of equivalents.”); *Alpex Comput. Corp. v. Nintendo Co. Ltd.*, 102 F.3d 1214, 1222 (Fed. Cir. 1996).

¹⁶⁰ MUELLER, *supra* note 8, at 102.

¹⁶¹ Maier & Lytle, *supra* note 153, at 247.

¹⁶² Quinn, *supra* note 147.

¹⁶³ *See* U.S. PATENT & TRADEMARK OFF., *USPTO Fee Schedule*, <https://www.uspto.gov/learning-and-resources/fees-and-payment/uspto-fee-schedule> (last revised Oct. 10, 2019).

¹⁶⁴ Quinn, *supra* note 147.

specification. When acting as their own lexicographer, the patentee should ensure that structure is provided; otherwise, the made-up term is an easy target. Practitioners should always keep in mind that experts' minds can differ on whether a structure would be known by PHOSITAs as a common structure. So, one should be careful in examining the patent for terms that could be interpreted to be made up or not used in common parlance, because "[i]t is not always easy to tell which words will be considered structure, and which will be considered 'nonce words.' If there is any doubt, an extra sentence or two in the specification giving examples of various structures that could be used to perform the structure will provide significant insurance against a finding of indefiniteness."¹⁶⁵ In summary, the best practice would be to add as many embodiments to the specification as possible.¹⁶⁶

IV. Conclusion

Functional claiming is a dying art and the bite of indefiniteness comes for unsuspecting victims. In the last two decades of means-plus-function review, the Federal Circuit has left more unclear than it has clarified. In the post-*Williamson* aftermath, district courts are still confused about the burdens each party must carry, specifically the weight of the presumption of validity against the rebuttable presumption of means-plus-function. The two most cited means-plus-function cases post-*Williamson* diverge greatly in their frameworks for analyzing these types of claims. If the law is not resolved soon, these cases will only propagate more confusion as courts continue to invalidate issued "means-plus-function" claims. Without a distinct framework for analyzing these claims or a clear rule for when § 112(f) applies, practitioners are defenseless to the challenge of function lacking structure.

of global Internet governance as a regime that relied very little on legal regulation surprised scholars. Global Internet governance does incorporate law in various ways, but technologies, standards, and standards bodies have proven more central to Internet governance than law. In part, Internet governance developed in this way because of early political decisions in the United States to forgo extensive regulation of the Internet, relying instead on other governance mechanisms. But the discourse of global Internet governance occludes the aporia of intellectual property exceptionalism. As the Internet expanded, and Internet governance became global, the international intellectual property regime reacted to the emerging phenomenon by fashioning new forms of control over digital technology. Internet governance was able to take its non-regulatory form only by skirting the domain of intellectual property. Subsequently, Internet infrastructure, the site of Internet governance, has been co-opted to serve the demands of the intellectual property regime. Imbalance between these regimes served the spread of the Internet

¹⁶⁵ Metha & Osha, *supra* note 152.

¹⁶⁶ Quinn, *supra* note 147 ("Describe things generally and build to ever more specific embodiments and alternative descriptions, explaining all the variations and possibilities with as much detail as you possibly can.").

as a technology communication dominated by platforms which could either leverage or at least overcome the barriers of surmount intellectual property to take advantage of an otherwise less regulated zone. Internet governance and the global intellectual property regime are fundamentally incongruous. But evidence of the incongruity between the regimes is often explained away, the evidence is framed as pointing only to isolated conflicts which are occasioned by one of the regimes failing to adjust its workings to that of the other, rather than ontological discordance. Consensus on which regime should be adjusted has not always been as easy to find. Consensus should be more easily reached if there are only discrete conflicts rather than fundamental disharmony. But whether a conflict remains unresolved, or has been decided by power rather than principle, it is nonetheless portrayed as resolvable by a purely localized rather than systematic settlement.

As personal data became essential to dominant platforms, the narrative of unsullied technological progress began to fray, inciting calls for new regulation. The eccentric coupling between Internet governance and the global intellectual property regime remains apparently unaffected. This standoff seems unlikely to last. As innumerable, diverse things become connected to the Internet, massively increasingly surveillance and enabling action with physical consequences at a distance, the makeup of the Internet itself is changing. This change, which may be called the Internet of Things, introduces threats to personal and national security, to privacy and autonomy. These issues are prompting national and global policy responses, including demand for new regulations; for example, greater protection of personal data has been implemented in Europe and may grow in the United States. This, to a degree, undercuts the technological form of Internet governance. As the IoT connects many previously unconnected aspects of life to the Internet, it also potentially increases the reach and importance of Internet governance. Technologies, technical standards, and the bodies that produce them will become even more important for daily life as they determine security, privacy, safety, liability, and the sustainability of many more aspects of human existence. Even efforts to address the challenges of the IoT by regulation will of necessity rely upon technical standards and sometimes technical enforcement through the infrastructure of the Internet.

Whether the response to the IoT is primarily mediated through technologies and standards or through laws, Internet governance is being ineluctably drawn into a decisive engagement with the global intellectual property regime. Intellectual property rules require layers of permission, crippling the potential of permission less innovation. Intellectual property hobbles precautionary approaches. Regulation cannot impose a precautionary duty on a service provider, manufacturer or other actor to secure information, a device or a network connection if that actor is prohibited by intellectual property from making the necessary changes to the technologies involved. Similarly, IoT cannot fail well for as long as anti-circumvention laws put security researchers at constant risk of criminal penalties. The owners of many IoT devices cannot make their own choices about privacy and protect themselves from online attack for as long as anti-circumvention laws threaten them with criminal liability for doing so.

Although this analysis has used the rubric of the Internet of Things as if it consists of a somehow separable network, there is only one Internet, it already includes many things that communicate only with each other, or only with computers that themselves communicate only with other computers. The future of Internet governance is governance of an Internet likely to be comprised by many connected things and relatively fewer connected people. The form that governance takes will in large part be determined by how the current Internet governance regime responds to the policy constraints imposed by the global intellectual property regime.

Will openings in the global intellectual property regime prove useful to responses to the challenges of the Internet of Things? There are some potential openings in the global intellectual property regime, particularly flexibilities in the TRIPS agreement, which allow for the development of legal solutions to patent, anti-circumvention, and trade secret problems. There is some flexibility in the WCT's requirements for anti-circumvention provisions which could be used to avoid the unworkable results of the DMCA and Canadian law discussed although the requirement for anti-circumvention itself persists. But these are openings for legal reform at a national level, or on an international level for treaties or model laws. How can the non-state actors of the Internet governance regime seize these openings? The history of the global intellectual property regime suggests that it is unlikely to exhibit the same kind of lithe reactions as the Internet governance regime.