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Recommended Citation

Link to publisher version (DO1)
https://doi.org/10.15779/Z385Z93
**WILLIAMSON v. CITRIX ONLINE:**
A FUNDAMENTAL SHIFT AND RETURN TO FORM IN MEANS-PLUS-FUNCTION INTERPRETATION

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In an en banc opinion on July 16, 2015, the Federal Circuit sent shockwaves through the patent world by overturning a decade-long precedent that emphasized a “strong presumption” that a claim limitation lacking the word “means” is not subject to 35 U.S.C. § 112(f).¹ During its decade-long tenure, the strong presumption had facilitated an expansion of functional claiming that was unchecked by statutory constraint.² This landmark decision in *Williamson v. Citrix Online, LLC* (“Williamson II”) overturned a long line of cases starting from *Lighting World, Inc. v. Birchwood Lighting, Inc.*, which first established the strong presumption.³

*Williamson II* departed from the heightened standard established in *Flo Healthcare Solutions v. Kappos*, which required that a claim limitation invoking § 112(f) “essentially [be] devoid of anything that can be construed as structure.”⁴ In place of the strong presumption, *Williamson II* restored the pre-*Lighting World* standard for determining whether a non-“means” claim limitation invokes § 112(f): “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.”⁵

The bright line rule that the Federal Circuit established in *Lighting World* had the unintended consequence of spawning a plethora of functional claims with broad scope unbounded by statutory intent because of a

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¹. *Williamson v. Citrix Online, LLC* (*Williamson II*), 792 F.3d 1339 (Fed. Cir. 2015) (en banc). Unless otherwise noted, pre-AIA 35 U.S.C. § 112(6) and AIA 35 U.S.C. § 112(f) will be collectively referred to as § 112(f) or 112(f).
². See *Williamson II*, 792 F.3d at 1348.
³. 382 F.3d 1354 (Fed. Cir. 2004); see id.
⁴. See *Williamson II*, 792 F.3d at 1349 (citing *Flo Healthcare Solutions, LLC v. Kappos*, 697 F.3d 1367, 1374 (Fed. Cir. 2012)).
⁵. *Id.* at 1349 (citing Greenberg v. Ethicon Endo-Surgery, Inc., 91 F.3d 1580, 1583 (Fed. Cir. 1996)). Claim limitations or terms lacking the word “means” are henceforth referred to as non-“means” limitations or terms.
Patent applicants exploited the bright line rule to draft functional claims without the term "means" to describe an invention based on what it does, without providing any detail on how it is made. The Williamson II decision reduces the scope of some of these functional claims to disclosed embodiments by imposing the restrictions of § 112(f). The impact of Williamson II has been pervasive, propagating to the district courts and Patent and Trial Appeal Board (PTAB). For example, the PTAB has actively referenced Williamson II in administrative decisions sua sponte.

Although Williamson II is a step in the right direction to curb overly broad functional claims, it does not provide clarity on how to interpret the restored pre-Lighting World standard (whether a claim term is understood to have sufficiently definite structure) in view of common law that has developed in support of the strong presumption. This Note analyzes the development and impact of Williamson II. Part I explores the historical development of interpreting claim limitations under § 112(f) leading up to Williamson II. Part II examines the Williamson II decision. Part III investigates the application of Williamson II by the district courts and PTAB. Part IV analyzes two issues that remain unaddressed by Williamson II.

6. See Williamson II, 792 F.3d at 1349. The court noted that the “strong” presumption that a non-“means” claim limitation is not subject to § 112(f) had resulted in a “proliferation of functional claiming untethered to § 112, para. 6 and free of the strictures set forth in the statute.” Id.


8. See Blackboard, Inc. v. Desire2Learn, Inc., 574 F.3d 1371, 1383 (Fed. Cir. 2009) (“Without so limiting a claim, we noted, ‘the patentee has not paid the price but is attempting to claim in functional terms unbounded by any reference to structure in the specification.’”) (quoting Aristocrat Techs. Austl. v. Int’l Game Tech., 521 F.3d 1328, 1333 (Fed. Cir. 2008)).


II's reversal of the strong presumption in view of the common law that developed in support of the strong presumption. First, Williamson II has not addressed a shift from an objective standard of claim interpretation to a subjective standard, and second, Williamson II has not addressed how to interpret the structural character of multi-word adjectival terms. Part IV provides an overview of these issues and proposes a framework for determining whether non-“means” claims invoke § 112(f).

I. HISTORICAL DEVELOPMENT OF MEANS-PLUS-FUNCTION CLAIM INTERPRETATION

Functional claiming can be problematic for companies developing products because an “absence of clear boundaries” on functional claims fails to provide sufficient notice on whether a product infringes.12 In order to determine whether an accused product infringes a patent claim, a company accused of infringement must engage in costly litigation, which siphons resources away from product development and innovative activity.13

The historical development of § 112(f) contemplated such negative implications of overly broad functional claiming and imposed statutory limits on the scope of functional claims.14 Cases decided before the establishment of the strong presumption in Lighting World applied reasoned objective criteria to determine whether a claim limitation invoked § 112(f).15 However, subsequent to Lighting World, the strong presumption facilitated a gradual departure from objective analysis toward an arbitrary

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12. See, e.g., Lemley, supra note 7, at 906.
13. See id. at 931–32, 934 (“[T]rolls cost the economy $500 billion over the last twenty years, mostly in the information technology industry.”).
14. See Brad A. Schepers, Interpretation of Patent Process Claims in Light of the Narrowing Effect of 35 U.S.C. § 112(6), 31 IND. L. REV. 1133, 1134, 1139 (1998); see also In re Donaldson Co., Inc., 16 F.3d 1189, 1193, 1195 (Fed. Cir. 1994) (“[O]ur holding in this case merely sets a limit on how broadly the PTO may construe means-plus-function language under the rubric of 'reasonable interpretation.'”). The Federal Circuit clarified that the “reasonable interpretation” standard for examining § 112(f) claims in a patent application pending before the United States Patent Office (PTO) requires an evaluation of the structure disclosed within the application’s specification. Id.
15. See, e.g., Greenberg v. Ethicon Endo–Surgery, Inc., 91 F.3d 1580, 1583 (Fed. Cir. 1996) (“Dictionary definitions make clear that the noun ‘detent’ denotes a type of device with a generally understood meaning in the mechanical arts, even though the definitions are expressed in functional terms.”).
inclination against invoking § 112(f) on non-“means” claim limitations, thereby effectively eroding statutory limits on functional claiming.  

A. OVERVIEW OF FUNCTIONAL CLAIMING

Patent applicants employ functional claiming to draft claims that describe an invention based on the functionality of the invention (e.g., what the claimed invention does), instead of the implementation of the invention (e.g., how the claimed invention operates in practice). As an analogy, functional claiming describes a claimed invention in terms of black boxes, without providing detail about the inner workings of the black boxes. Functional claiming provides broad coverage over various implementations that can carry out the same function, rather than being restricted to a specific implementation for executing the function.

The 2011 America Invents Act (AIA) and the Patent Act of 1952 (“Patent Act”) provide for a specific case of functional claiming under § 112(f) that is limited to the embodiments “described in the specification and equivalents thereof.” Section 112(f) covers both system claims (e.g., drafted in “means for” format), and method claims (e.g., drafted in “step for” format). The Williamson II decision addresses the issue of system


Here, we have neither a dictionary definition to establish that ‘aesthetic correction’ is an appropriate A.Q. to suggest definite structure nor expert testimony that the accompanying description of the operation of the circuit, if any, connotes definite circuit structure-sequence of particular circuit components-to an artisan so that he could draw on paper the arrangement of the components needed. Id.


19. See Blackboard, Inc. v. Desire2Learn, Inc., 574 F.3d 1371, 1383 (Fed. Cir. 2009) (“Without so limiting a claim, we noted, ‘the patentee has not paid the price but is attempting to claim in functional terms unbounded by any reference to structure in the specification.’”) (quoting Aristocrat Techs. Austl. v. Int’l Game Tech., 521 F.3d 1328, 1333 (Fed. Cir. 2008)).


21. See Masco Corp. v. United States, 303 F.3d 1316, 1326 (Fed. Cir. 2002); Paul Devinsky, United States: Step-Plus-Function Analysis Is the “Key” to the Proper Claim Construction, MONDAQ (Nov. 8, 2002), http://www.mondaq.com/unitedstates/x/18665/Patent/StepFunctionAnalysisandAnalysisIs+the+Key+to+the+Proper+Claim+Construction [https://perma.cc/J5R-7LPL]; see also OI Corp. v. Tekmar Co., Inc., 115 F.3d 1576, 1583 (Fed. Cir. 1997); Jeffery Keuster, Means-Plus-Function Claiming: Recent
claims drafted using placeholder “nonce” words (e.g., “mechanism,” “element,” “device”) instead of the word “means” to avoid classification as means-plus-function terms under § 112(f), but intended to cover the breadth of a functional claim. Because Williamson II removes the strong presumption against invoking § 112(f) against non-“means” claim terms, such functional system claims may now invoke § 112(f).

B. HISTORICAL DEVELOPMENT OF § 112(F)

Concerns about the potential overbreadth of functional claims played a central role in the development of § 112(f). Congress first enacted § 112(6) as a legislative response to the Supreme Court decision in Halliburton Oil Well Cementing Co. v. Walker. In Halliburton, the Court held that functional claim language was indefinite and could not be used to describe the most crucial element of a combination claim that would impart “novelty” to the claim. The Court found that all components of the disputed claim were known in the art, and that the only new contribution over the prior art was itself a well-known device. The Court did not dispute the validity of the claim over the prior art, but instead focused on

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22. See Williamson II, 792 F.3d 1339, 1350–1351 (Fed. Cir. 2015).
25. See Halliburton, 329 U.S. at 8–9, n.7. The claims at issue related to methods and systems for determining a distance to a surface of fluid within an oil well. An exemplary claim at issue in Halliburton is provided below with inventive aspects in italics, written in functional form:

In an apparatus for determining the location of an obstruction in a well having therein a string of assembled tubing sections interconnected with each other by coupling collars, means communicating with said well for creating a pressure impulse in said well, echo receiving means including a pressure responsive device exposed to said well for receiving pressure impulses from the well and for measuring the lapse of time between the creation of the impulse and the arrival at said receiving means of the echo from said obstruction, and means associated with said pressure responsive device for tuning said receiving means to the frequency of echoes from the tubing collars of said tubing sections to clearly distinguish the echoes from said couplings from each other. (emphasis added).

26. Id. at 6–7 (“Walker’s contribution which he claims to be invention was in effect to add to Lehr and Wyatt’s apparatus a well-known device which would make the regularly appearing shoulder echo waves more prominent on the graph and easier to count.”).
the wording of the claims.27 In focusing on the claim limitations describing the novel aspect of the claim, the Court expressed concerns that the patent was in a “field crowded almost, if not completely, to the point of exhaustion.”28 The Court noted that because patents in such a crowded field “consist[] of a combination of old ingredients” that are “much more numerous than any other,” it was of the greatest importance that the description of the inventive combination be “full, clear, concise and exact.”29

The *Halliburton* decision, at its time of issuance, brought clarity to inconsistent treatment of functional claims at the trial courts and appellate courts.30 The Court presciently pointed out that “patents on machines which join old and well-known devices with the declared object of achieving new results . . . easily lend themselves to abuse,” and accordingly required clarity of such claims.31

The congressional enactment of § 112(6) legitimized the practice of functional claiming and overturned *Halliburton’s* judicial precedent.32 However, the drafters of the statute, perhaps recognizing the potential for abuse of functional claiming, explicitly limited the scope of § 112(6) claims to the “corresponding structure, material, or acts described in the specification and equivalents thereof” for patentability determinations.33

The statutory text of § 112(6) has barely changed over the last half century. It emerged with minor amendments, as § 112(f), after the recent overhaul of the patent system via the AIA.34

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27. *Id.* at 7–8 (“[W]e can accept without ratifying the findings of the lower court that the addition of ‘a tuned acoustical means’ performing the ‘function of a sound filter’ brought about a new patentable combination, even though it advanced only a narrow step beyond Lehr and Wyatt’s old combination.”).

28. *Id.* at 10.

29. *Id.* at 11.


32. See Schepers, *supra* note 14, at 1140 (“In response to *Halliburton* and the uncertainty surrounding functional claim language prior to this landmark decision, Congress enacted 35 U.S.C. § 112(6) authorizing the expression of a claim element in terms of a means or step for performing a specific function.”).

33. See *id.* at 1140 (“Congress’ inclusion of the second clause of paragraph six indicates that they, like the Supreme Court, had concern over the breadth and ambiguity surrounding functional language.”).

C. **Invocation of § 112(f)**

In the two decades prior to the *Williamson II* decision, the courts often considered whether a claim limitation invokes § 112(f), based on one of four scenarios: whether (1) a “means” limitation invoked § 112(f), (2) a “means” limitation did not invoke § 112(f), (3) a non-“means” limitation invoked § 112(f), or (4) a non-“means” limitation did not invoke § 112(f). Judicial precedent established at least three criteria for determining whether a claim limitation invoked § 112(f). The issue of the strong presumption against invocation of § 112(f) for non-“means” claims first emerged in *Lighting World* and was subsequently expanded in the decade leading up to *Williamson II*.36

1. **Invocation of § 112(f) Before *Lighting World***

In determining whether a claim limitation invoked § 112(f) prior to *Lighting World*, the courts consistently applied the following criteria: (1) whether the disputed claim term connoted any structure by its plain meaning, (2) whether the claim limitation recited any structure, and (3) whether the claim limitation included a function linked to a disputed term. These criteria are similar to the three-pronged analysis set forth in the Manual of Patent Examining Procedure (MPEP) used by Patent Examiners in the PTO and could apply regardless of whether the claim limitation explicitly recited the term “means.” Judicial precedent has formalized these criteria into two rebuttable presumptions: (1) that use of the word “means” invokes § 112(f), and (2) that absence of the word “means” does not invoke § 112(f). The analysis below focuses on the instances where non-“means” terms invokes § 112(f).
First Criterion: Whether the Claim Limitation Connotes Sufficient Structure

The first criterion evaluates the plain language of a disputed claim limitation, regardless of whether said limitation is written in means-plus-function format. If the limitation connotes sufficient structure to a skilled person, is not a generic structural term, and has a clear meaning, then the limitation does not invoke § 112(f).

i) Non-“Means” Terms Not Invoking § 112(f)

Courts have applied the first criterion to find that non-“means” claim limitations do not invoke § 112(f). In Greenberg v. Ethicon Endo-Surgery, Inc., the Federal Circuit held that the non-“means” limitation “detent mechanism” did not invoke § 112(f). Instead, the Federal Circuit found that “detent mechanism” had “a generally understood meaning in the mechanical arts,” and cited to several dictionary definitions for “detent” to support its conclusion.

The disputed claim limitation was not written in means-plus-function form, although the plaintiff’s proposed claim construction was in functional form. The court noted that the proposed construction in “functional terms” was not sufficient to convert a construed claim element into a “means for performing a specified function” that invokes § 112(f). The court supported this statement by identifying two classes of devices that took names based on related functions. A first class took names from functions performed (e.g., “filter,” “brake,” “clamp,” note the names are both a noun and a verb). A second class took names that described their function (e.g.,

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42. Greenberg, 91 F.3d at 1583–84.
43. Id.
44. Id. at 1581–82 (the claim limitation “detent mechanism defining the conjoint rotation of said shafts in predetermined intervals” was not written in “means for” form). Id. at 1583 (“[T]he definition of ‘detent mechanism’ provided by Dr. Greenberg’s expert (i.e., ‘[a]ny device for positioning and holding one mechanical part in relation to another so that the device can be released by force applied to one of the parts’) w[as] expressed in functional terms.”); see OI Corp. v. Tekmar Co., Inc., 115 F.3d 1576, 1580–81 (Fed. Cir. 1997). The Federal Circuit has clarified that courts must separately evaluate each non-“means” terms within a means-plus-function claim limitation to determine whether the term invokes § 112(f). Id. The court held that § 112(f) did not apply to a term “passage” because it did not perform a claimed function of a means-plus-function limitation, but merely specified where the function took place. Id. at 1581 (“Although the passage may act upon the slug by channeling it while it is being passed, it is not the means that causes the passing. Rather, it is the place where the function occurs, not the structure that accomplishes it.”).
45. Greenberg, 91 F.3d at 1583.
46. Id.
47. Id.
“graspers,” “cutters,” “suture applicators;” note the names are nouns derived from verbs). This means that the term “detent” was similar to the terms of the first and second classes of devices “with a generally understood meaning in the mechanical arts.”

Although the Federal Circuit in Greenberg found that a non-“means” term did not invoke § 112(f), it warned against determining whether to invoke § 112(f) based only on use of the term “means,” citing to prior cases that found terms introduced by “so that” to be equivalent to “means for” terms.

The Federal Circuit heeded this warning in later cases. In Personalized Media Communications v. Int’l Trade Commission (“PMC”), it found that “a digital detector” did not invoke § 112(f), because it had “a well-known meaning to those of skill in the electrical arts connotative of structure.” Even though the disputed claim limitation was written in function form (e.g., “detector for receiving”), the court still held that the claim limitation did not invoke § 112(f) because it connoted sufficient structure, was not a generic structural term, and had clear meaning based on dictionary definitions. PMC extended Greenberg’s reasoning from a non-“means” term not drafted in functional form to a non-“means” term drafted in functional form.

ii) Non-“Means” Terms Invoking § 112(f)

The Federal Circuit has applied the same reasoning from Greenberg and PMC to conclude that some non-“means” claim limitations lack sufficient structure and accordingly invoke § 112(f). In Mas-Hamilton Group v. LaGard, Inc., the court found that “lever moving element” and “movable link member” invoked § 112(f) because said terms did not connotate sufficient structure. The court noted that the plaintiff had not shown evidence that “lever moving element” had a well-known meaning in the art. No dictionary definitions were cited for these two terms.

48. Id. The court concluded that the term “detent” was similar to the terms of the first and second classes of devices “with a generally understood meaning in the mechanical arts.” Id.

49. Id. at 1584.

50. 161 F.3d 696, 704 (Fed. Cir. 1998).

51. Id.

52. See supra Section I.C.1.a)i). Recall that in Greenberg v. Ethicon Endo-Surgery, Inc., the proposed construction, not the claim limitation itself, was in functional form. 91 F.3d 1580, 1583 (Fed. Cir. 1996).


54. Id.

55. “[L]ever” and “link” arguably fall into the first class of Greenberg devices, taking names from functions performed. However, the term lever was used to describe a function instead of structure—“lever moving element”—and the term “link” might have been deemed a “general structural term” instead of structure known to one skilled in the art. Id.
b) Second Criterion: Whether the Claim Limitation Recites Structure

The second pre-Lighting World criterion for determining whether a claim limitation invokes § 112(f) asks whether the claim limitation as a whole recites sufficient structural elements understood by one of ordinary skill in the art. If the claim limitation recites sufficient structural elements, it does not invoke § 112(f).

In Al-Site Corp. v. VSI International, Inc., the Federal Circuit found that a number of terms did not invoke § 112(f). Instead of citing to dictionary definitions for claim terms, the court found that each disputed claim limitation as a whole recited sufficient structure. In Watts v. XL Systems, the Federal Circuit similarly found that the claim limitation “joint . . . such that one joint may be sealingly [sic] connected . . . with another such joint” did not invoke § 112(f) because it included sufficient structure.

Unlike the first criterion, which has used dictionaries as an objective basis to determine whether a claim term connotes sufficient structure, the application of the second criterion has not used a clear objective basis for identifying structure. For example, the application of the second criterion to non-“means” terms in Al-Site and Watts appears to leave some ambiguity as to what constitutes sufficient structural elements. In Al-Site, the structural element of the “eyeglass contacting member” was an “encircling portion adapted to encircle part of a frame.” Under the first criterion from Greenberg and PMC, there might be dispute as to whether “encircling portion” alone constitutes sufficient structure.

at 1213–15. If the plaintiff had argued that “link” was a well-known term with clear meaning (e.g., by citing to dictionary definitions), it might have prevailed on arguing for a non-112(f) interpretation of “link member.” See id.

56. 174 F.3d 1308, 1318 (Fed. Cir. 1999). The disputed terms included “eyeglass hanger member,” “eyeglass contacting member,” and “attaching portion attachable to a portion.” Id.

57. See id. at 1318 (“Moreover, although these claim elements include a function, namely, ‘mounting a pair of eyeglasses,’ the claims themselves contain sufficient structural limitations for performing those functions.”). As a first example, a claim recited structure for an “eyeglass hanger member” as “made from flat sheet material.” Id. at 1318. As a second example, a claim recited structure of an “eyeglass contacting member” as “having an encircling portion adapted to encircle a part of said frame.” Id. at 1319.

58. 232 F.3d 877, 881 (Fed. Cir. 2000) (“Specifically, the claim limitation recites ‘a second end formed with tapered external threads’ and refers to ‘a first end’ with ‘tapered internal threads.’ These terms clearly have reasonably well understood meanings in the art as names for structure.”).

59. Al-Site, 174 F.3d at 1318.
c) Third Criterion: Whether the Claim Limitation Includes a Function

Under the third criterion, if a claim limitation does not recite a function, it does not invoke § 112(f). In York Products, the Federal Circuit found that the claim limitation “means formed on the upwardly extending liner sidewall portions” did not invoke § 112(f) despite reciting the term “means”, in part, because it did not link the term “means” to a function.60

The Rebuttable Presumptions Framework

Common law development has formalized the aforementioned three criteria into two rebuttable presumptions: (1) that use of the word “means” invokes § 112(f), and (2) that failure to use the word does not invoke § 112(f).61

A party can overcome the presumption that a “means” claim limitation should invoke § 112(f) if the claim limitation either (1) connotes sufficient structure (e.g., first criterion),62 (2) recites sufficient structure (e.g., second criterion),63 or (3) does not include a function (e.g., third criterion).64 Inversely, a party can overcome the presumption that a non-“means” claim limitation should not invoke § 112(f) if the claim limitation (1) does not connote structure when written in functional form (e.g., first and third criteria)65 and (2) does not recite sufficient structure when written in functional form (e.g., second and third criteria).66


61. See Williamson II, 792 F.3d 1339, 1348 (Fed. Cir. 2015) (citing PMC, 161 F.3d 696 (Fed. Cir. 1998)); see also MPEP 2181(I).

62. Cole v. Kimberly-Clark Corp., 102 F.3d 524, 531 (Fed. Cir. 1996) (the disputed term, “perforation means,” was found not to invoke § 112(f)). The Federal Circuit noted that “[a]n element with such a detailed recitation of its structure, as opposed to its function, cannot meet the requirements of the statute.” Id.

63. York Prods., 99 F.3d at 1573–74 (the disputed term was “means formed on the upwardly extending liner sidewall portions including a plurality of spaced apart, vertically extending ridge members”).

64. See id. (“Without an identified function, the term ‘means’ in this claim cannot invoke 35 U.S.C. § 112, ¶ 6.”).

65. See, e.g., Mas-Hamilton Grp. v. LaGard, Inc., 156 F.3d 1206, 1213–14 (Fed. Cir. 1998) (the disputed non-“means” term was “movable link member”).

66. See id. at 1215 (“Further, we do not see that the remaining terms in the claim limitation other than those defining the two functions . . . .”).
A rebuttable presumption, unless overcome by a challenger, will guide the interpretation of a disputed limitation.\textsuperscript{67} For example, a claim limitation that recites "digital detector" is presumed not to invoke § 112(f) unless the rebuttable presumption is overcome.\textsuperscript{68}

2. \textit{Invocation of § 112(f) After Lighting World and Before Williamson II}

In \textit{Lighting World}, the Federal Circuit for the first time qualified the presumption that a non-"means" claim limitation does not invoke § 112(f) as a "strong one that is not readily overcome."\textsuperscript{69} The cases following \textit{Lighting World} departed from the reasoned analysis of the three pre-\textit{Lighting World} criteria and expanded the strong presumption. The decision in \textit{Phillips v. AWH Corp.} may have facilitated a departure from relying upon objective extrinsic evidence (e.g., dictionaries as used in the first criterion).\textsuperscript{70} After \textit{Phillips}, the Federal Circuit expanded the scope of the "strong" presumption through a line of cases that related to "adjectival qualifiers" leading up to \textit{Williamson II}.\textsuperscript{71}

a) \textit{Phillips} De-emphasizes the Importance of Extrinsic Evidence, Facilitating a Shift Towards Subjective Claim Interpretation

The \textit{Phillips} decision, while not referencing the strong presumption in \textit{Lighting World}, might have facilitated the expansion of the strong presumption by undermining the use of objective extrinsic evidence.\textsuperscript{72} In \textit{Phillips}, the court criticized a methodology that "placed too much reliance on extrinsic sources such as dictionaries."\textsuperscript{73} Instead, it established a methodology for interpreting claim terms that starts with the context of a particular claim, and then looks at intrinsic evidence (e.g., a patent

\begin{itemize}
\item \textsuperscript{67} See \textit{Williamson II}, 792 F.3d at 1348 (citing \textit{PMC}, 161 F.3d 696 (Fed. Cir. 1998)); see also MPEP 2181(I).
\item \textsuperscript{68} See \textit{PMC}, 161 F.3d 696, 703–05 (Fed. Cir. 1998) (the disputed claim term was "digital detector").
\item \textsuperscript{69} See \textit{Lighting World, Inc. v. Birchwood Lighting, Inc.}, 382 F.3d 1354, 1358 (Fed. Cir. 2004).
\item \textsuperscript{70} See \textit{F.3d at 1303, 1320–21} (Fed. Cir. 2005) (en banc).
\item \textsuperscript{71} See, e.g., \textit{Mass. Inst. of Tech. & Elecs. for Imaging, Inc. v. Abacus Software (MIT)}, 462 F.3d 1344, 1355 (Fed. Cir. 2006) (the disputed claim terms involved various "circuitry" modified by an adjectival qualifier); \textit{Inventio AG v. Thyssenkrupp Elevator Americas Corp.}, 649 F.3d 1350, 1356, 1358 (Fed. Cir. 2011) (the disputed terms were "modernizing device" and computing unit"); \textit{Apple, Inc. v. Motorola, Inc.}, 757 F.3d 1286, 1296–97 (Fed. Cir. 2014) (the terms under consideration were variants of the term "heuristic").
\item \textsuperscript{72} See \textit{Phillips}, 415 F.3d at 1303, 1311.
\item \textsuperscript{73} Id. at 1320–21.
\end{itemize}
specification and prosecution history). Extrinsic evidence such as “expert and inventor testimony, dictionaries, and learned treatises” are “less significant than the intrinsic record in determining ‘the legally operative meaning of claim language.’” Because this framework de-emphasizes extrinsic objective evidence in favor of intrinsic evidence, it might have facilitated the departure from an objective analysis of disputed § 112(f) terms towards a subjective analysis based on subjective interpretation of the intrinsic record, a shift that facilitated expansion of the strong presumption.

b) The Federal Circuit Expands the Strong Presumption from *Lighting World* Through a Line of Cases Relating to Adjectival Qualifiers

The disputed claim term in *Lighting World* was a compound term that included an adjectival qualifier and a base term. A subsequent series of cases expanded use of the strong presumption to find that increasing numbers of compound terms did not invoke § 112(f) based on interpretation of the adjectival qualifier.

Although *Lighting World* set a precedent for the “strength of the presumption,” it still provided reasoned analysis on whether a term invoked § 112(f). The Federal Circuit noted that the standard was not whether a disputed term brought to mind a particular structure, but whether the term was “one that is understood to describe structure, as opposed to a term that is simply a nonce word or a verbal construct.” The court in *Lighting World*, as in prior cases, relied upon objective meanings from dictionaries to construe a disputed term. However, in *Lighting World*, the court focused on defining an adjective (“connector”) of a disputed term (“connector

74. *Id.* at 1313, 1317 (“Importantly, the person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification. . . . In addition to consulting the specification, we have held that a court ‘should also consider the patent’s prosecution history, if it is in evidence.’”).

75. *Id.* at 1317.


77. See, e.g., *MIT*, 462 F.3d 1344 (Fed. Cir. 2006) (the disputed claim terms involved various “circuitry” modified by an adjectival qualifier); *Inventio AG v. Thyssenkrupp Elevator Americas Corp.*, 649 F.3d 1350, 1356, 1358 (Fed. Cir. 2011) (the disputed terms were “modernizing device” and computing unit”); *Apple Inc. v. Motorola, Inc.*, 757 F.3d 1286, 1296–97 (Fed. Cir. 2014) (the terms under consideration were variants of the term “heuristic”).


79. *Id.*

80. *Id.* at 1360–61.
assembly)."81 By focusing on the term “connector,” the court appeared to concede that the base term “assembly” might be accepted as a generic word.82

In MIT v. Abacus Software, the Federal Circuit analyzed the base terms and adjectival modifiers of two compound terms to determine whether the compound terms invoked § 112(f).83 The court found that the base term “mechanism” of a first compound term, “colorant selection mechanism,” did not have a sufficiently definite meaning.84 The court then determined that the adjective “colorant selection” was “not defined in the specification,” had “no dictionary definition,” and did not have a “generally understood meaning in the art.”85

In contrast to the finding that the base term “mechanism” did not have a sufficiently definite meaning, the court found that the base term “circuitry” of a second compound term, “aesthetic correction circuitry,” did connote sufficient structure based on dictionary definitions for “circuit” and “circuitry.”86 The court also cited to precedent from an earlier case, Apex v. Raritan, where it concluded that the term “circuit,” combined with a description of the operation of the circuit connoted sufficient structure to one of ordinary skill.87 To respond to a dissenting opinion against the non-112(f) determination, the court reiterated the “strength of the presumption” for non-“means” claims.88

The invocation of the strong presumption against the dissent appears to signal a shift from relying upon reasoned objective analysis toward an inclination against invoking § 112(f) on non-“means” claims. The dissent

81. See id.
82. Recall that in Greenberg, the court construed the term “detent” in “detent mechanism,” but did not consider whether the term “mechanism” was a nonce word. See Greenberg v. Ethicon Endo-Surgery, Inc., 91 F.3d 1580, 1583 (Fed. Cir. 1996).
83. See MIT, 462 F.3d at 1355 (disputed terms “colorant selection mechanism” and “aesthetic correction circuitry”) (“In contrast to the term ‘mechanism,’ dictionary definitions establish that the term ‘circuitry,’ by itself, connotes structure.”) (“In two of our prior cases we concluded that the term ‘circuit,’ combined with a description of the function of the circuit, connoted sufficient structure to one of ordinary skill in the art to avoid 112 ¶ 6 treatment.”).
84. Id. at 1354.
85. Id. at 1354.
86. Id. at 1355.
87. Id. at 1356 (citing Apex, Inc. v. Raritan Computer, Inc., 325 F.3d 1364, 1373 (Fed. Cir. 2003)).
88. Id. at 1356 (“In arguing to the contrary, the dissent appears to misapprehend the strength of the presumption that applies when the term ‘means’ does not appear in the claim.”).
foretells the problems that the strong presumption would create. The dissent in *MIT* noted that the *Apex* decision, relied upon by the majority, concluded that “circuitry” connoted enough structure only in a limited context of certain adjectival qualifiers supported by technical dictionary definitions (e.g., interface circuit, logic circuit, etc.). Critically, the dissent observed that the adjectival qualifier in the disputed claim limitation (“aesthetic correction circuitry”) did not appear to have a clear dictionary definition or known meaning in the art. Although the majority in *MIT* invoked the strong presumption to rebut the dissent, it did not employ a dictionary or other objective evidence to evaluate the term “aesthetic correction” that modified the term “circuitry.”

Following *MIT*, some cases led with the strong presumption as the guiding post. In *Inventio AG v. Thyssenkrupp Elevator Americas Corp.*, the Federal Circuit led with the strong presumption and then looked to the written description to construe the claim terms. As in *MIT*, the court did not look to objective dictionary definitions for clarification on the adjectival qualifier or other disputed terms. Instead, the court looked to the specification to determine whether a claim term connotes “sufficiently definite structure.”

In *Flo Healthcare Solutions, LLC v. Kappos*, the Federal Circuit raised the bar for the strong presumption such that the court was unwilling to invoke § 112(f) unless a limitation essentially is “devoid of anything that can

89. *Id.* at 1361–64 (Michel, C.J., dissenting).
90. *Id.* at 1361–62 (Michel, C.J., dissenting). The dissent also noted another case where the Federal Circuit extended the reasoning of *Apex* such that the use of “circuit” coupled with a description of the circuit’s operation may connote “sufficient structural meaning” when bolstered by expert testimony. *Id.* at 1363–64 (Michel, C.J., dissenting) (citing Linear Tech. Corp. v. Impala Linear Corp., 379 F.3d 1311, 1320 (Fed. Cir. 2004)).
91. *Id.* at 1364 (“Here, we face a description of only the circuit’s function, not of how it operates with other circuits or devices to carry out that function.”).
92. *Id.* at 1355–56.
93. See *Inventio AG v. Thyssenkrupp Elevator Ams.* Corp., 649 F.3d 1350, 1356, 1358 (Fed. Cir. 2011) (the disputed terms were “modernizing device” and “computing unit”).
94. *Id.* at 1356, 1358 (the disputed adjectival qualifier was “modernizing”).
95. *Id.* at 1356, 1358. The court held that the term “modernizing device” connoted sufficient structure based on the treatment of the term as an electrical circuit in the device (e.g., connected to a computing unit), and based on the written specification, which described components of the modernizing unit. *Id.* at 1358–59. The court also found that the term “computing unit” did not invoke § 112(f) based on the specification, which referred to the “computing unit” as a computer. *Id.* at 1359–60.
be construed as structure." In this case, the court found that the term “height adjustment mechanism” did not invoke § 112(f).

In Apple, Inc. v. Motorola, Inc. ("Apple"), the Federal Circuit extended the principles of adjectival qualifiers established in MIT to determine that a number of disputed terms did not invoke § 112(f). The majority followed a two-step inquiry: (1) determining whether a claim limitation invoked § 112(f), and (2) construing the claim by identifying corresponding structure described in the specification.

The dissent in Apple disagreed with the majority’s reliance upon the specification to determine whether a claim limitation invoked § 112(f). The dissent was concerned that looking to the specification for structure to determine whether a claim limitation invoked § 112(f) would “eviscerate” means-plus-function claiming, with the “absurd result” that a term could only invoke § 112(f) if it has “no corresponding structure.”

These Federal Circuit cases illustrate a trend of expanding the strong presumption against invocation of § 112(f) while shifting to a more subjective construction of the disputed claims terms. The strict objective standard for invoking § 112(f) from Greenberg, supported by dictionary definitions (e.g., “detent”), has given way to a more lenient standard that allows patentees to include black box interpretations like those in Apple (e.g., inputs, outputs, and interrelations thereof) in a specification.

II. THE WILLIAMSON II DECISION

In Williamson II, the Federal Circuit overruled the strong presumption established in Lighting World and overruled the strict requirement established in Flo Healthcare that a claim limitation must be “essentially [] devoid” of structure in order to invoke § 112(f). The court reset the
standard for determining whether a non-“means” claim invokes § 112(f) to
“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.”103 If the claim term is a means-plus-function term, the court
construes the term first by identifying the claimed function and second by
determining what structure corresponds to the claimed function.104 If the
court cannot identify structure, then the claim may be held indefinite under
35 U.S.C. § 112(b).105

A. FACTS AND PROCEDURAL HISTORY

The plaintiff Richard A. Williamson (“Williamson”) asserted U.S.
Patent No. 6,155,840 (“'840 patent”) against multiple defendants including
Citrix Online, LLC, Microsoft Corporation, and Cisco Systems, alleging
infringement of products that related to remote access features.106 An
excerpt of the disputed claim is reproduced below including the disputed
limitation in italics.

8. A system for conducting distributed learning among a plurality
of computer systems coupled to a network, the system comprising:

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 the streaming data module.107

The district court had issued a claim construction order holding that the
term “distributed learning control module” was a means-plus-function term
that invoked § 112(f).108 Williamson appealed to the Federal Circuit, which
reversed in Williamson v. Citrix Online, LLC (“Williamson I”).109 A
subsequent en banc hearing vacated the Williamson I panel decision with

103. Id. at 1349 (citing Greenberg v. Ethicon Endo-Surgery, Inc., 91 F.3d 1580, 1583
(Fed. Cir. 1996)).
104. Id. at 1351 (citing Noah Sys., Inc. v. Intuit, Inc., 675 F.3d 1302, 1311–12, 1318–
19 (Fed. Cir. 2012)).
105. Id. Unless otherwise noted, Pre-AIA 35 U.S.C. § 112(2) and AIA 35 U.S.C.
§ 112(b) will be collectively referred to as 35 U.S.C. § 112(b) or 112(b).
106. See id. at 1343.
107. Id. at 1344 (emphasis added).
108. Id. at 1345.
109. 770 F.3d 1371 (Fed. Cir. 2014).
respect to the term “distributed control module” and re-affirmed the district
court holding that said term invoked § 112(f).\textsuperscript{110}

B. THE W\textsuperscript{ILLIAMSON I} F\textsuperscript{EDERAL CIRCUIT PANEL DECISION}

A two-judge majority of the Federal Circuit panel overturned the
district court construction of “distributed learning control module” as a
means-plus-function expression.\textsuperscript{111} A one-judge dissent by Judge Reyna
disagreed with the majority’s finding that the term “distributed learning
control module” did not invoke § 112(f).\textsuperscript{112}

The \textit{Williamson I} majority reiterated the strong presumption from
\textit{Lighting World} and the heightened standard from \textit{Flo Healthcare} that a claim
limitation be “so devoid of structure that the drafter constructively engaged
in means[-]plus-function claiming.”\textsuperscript{113} The majority criticized the district
court for failing to “give weight to the strong presumption” based on the
absence of the word “means.”\textsuperscript{114} The dispute focused on whether the base
term “module” of the disputed term “distributed learning control module”
connoted hardware or software to those skilled in the computer arts.\textsuperscript{115} The
majority cited to a number of dictionaries to demonstrate that the term
“module” would be understood to be a “software component” or
“component of hardware system.”\textsuperscript{116}

The \textit{Williamson I} majority additionally criticized the district court for
not considering the adjectival qualifier “distributed learning control” that
preceded the base term “module.”\textsuperscript{117} In construing the adjectival qualifier,
the majority cited only to the specification and not to any dictionaries as it
had done for the base term “module.”\textsuperscript{118}

The dissent in \textit{Williamson I} contended that the term “distributed control
learning module” did not connote sufficient structure because the term
“module” was used as a “nonce” word in place of the term “means.”\textsuperscript{119} The
dissent criticized the majority’s citation to dictionary definitions of
“module” as either hardware or software because the definitions referred

\begin{itemize}
\item \textsuperscript{110} \textit{Williamson II}, 792 F.3d at 1354.
\item \textsuperscript{111} \textit{Williamson I}, 770 F.3d at 1379.
\item \textsuperscript{112} \textit{Id.} at 1380 (Reyna, J., dissenting).
\item \textsuperscript{113} \textit{Id.} at 1378.
\item \textsuperscript{114} \textit{Id.} at 1378–79.
\item \textsuperscript{115} \textit{Id.}
\item \textsuperscript{116} \textit{Id.}
\item \textsuperscript{117} \textit{Id.} at 1380.
\item \textsuperscript{118} \textit{Id.} This analysis follows \textit{Apex} and \textit{MIT}, which separately analyzed base terms and
adjectival qualifiers. \textit{See supra} Section I.C.2.b).
\item \textsuperscript{119} \textit{Id.} at 1381–82 (Reyna, J., dissenting).
\end{itemize}
only to functional aspects of what hardware and software could do, but not to how the functions are implemented.120 The dissent further criticized the majority’s finding that the adjectival qualifier “distributed control learning” imparted structure to the claim limitation as a whole because neither the ordinary meaning of the adjectival modifiers, the specification, nor the prosecution history imparted any structural significance to said modifiers.121

C. THE WILLIAMSON II EN BANC FEDERAL CIRCUIT DECISION

An eleven-judge majority of the Federal Circuit overturned the Williamson I panel and reaffirmed the district court construction of “distributed learning control module” as a means-plus-function expression.122 The Williamson II majority overruled the strong presumption of Lighting World and heightened standard of Flo Healthcare that had formed the basis of the panel decision in Williamson I.123 In place of the strong presumption, the court has restored the standard from Greenberg.124

It noted that the “essential inquiry” for invocation of § 112(f) was “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.”125 When the words of a claim are insufficient to connote structure, then § 112(f) applies.126 The majority cautioned against “blindly elevat[ing] form over substance” and presented a test that relied upon more than mere recitation of the term “means” to analyze whether a claim limitation invokes § 112(f).127

The majority justified its departure from precedent because the bright line test of relying upon recitation of the term “means for” had resulted in “a proliferation of functional claiming untethered” to § 112(f) that were “free of the strictures set forth in the statute.”128 The issues noted here are similar to those raised earlier in the MIT dissent, which cautioned against

120. Id. at 1383 (Reyna, J., dissenting) (“The definitions disclose what software or hardware potentially do, not how it is done.”).
121. Id. (Reyna, J., dissenting).
122. Williamson II, 792 F.3d 1339, 1343 (Fed. Cir. 2015) (en banc).
123. Id. at 1349–51.
124. Id. (“Henceforth, we will apply the presumption as we have done prior to Lighting World”).
125. Id. at 1349 (citing Greenberg v. Ethicon Endo-Surgery, Inc., 91 F.3d, 1580, 1583 (Fed. Cir. 1996)).
126. Id. at 1348 (citing Watts v. XL Sys., Inc., 232 F.3d 877, 880 (Fed. Cir. 2000)).
127. Id. at 1348 (citing Cole v. Kimberly-Clark Corp., 102 F.3d 524, 531 (Fed. Cir. 1996)).
128. Id. at 1348–49.
claims that provided “a description of only the circuit’s function, not of how it operates with other circuits or devices to carry out that function.”129

Turning to the specific facts of the case, the majority noted that the claim term under consideration was not merely the “distribution learning control module” but also the subsequent step, “for receiving communications.”130 The majority commented that the claim was in a format “consistent with traditional means-plus-function claim limitations” and replaces the term “means” with “module,” a nonce word.131 It further described how generic terms and other nonce words may be tantamount to using “means” because they typically “do not connote sufficiently definite structure.”132 The adjectival qualifier merely described a function and also did not impart further structure.133 Nothing in the intrinsic record indicated any additional structure.134

The court dismissed the use of an expert declaration to provide support for structure that was not explicitly recited by the specification of a patent.135 It reiterated that though one of ordinary skill could understand how to program a computer to perform a recited function (and therefore create a specialized computer), such knowledge “cannot create structure where none otherwise is disclosed”.136 Having found that the claim term “distribution learning control module” invoked § 112(f), the court found the means-plus-function term indefinite under 35 U.S.C. § 112(b) because the specification did not clearly recite an algorithm necessary to provide the structure for the “means” term.137

129. MIT, 462 F.3d 1344, 1364 (Fed. Cir. 2006) (Michel, J., dissenting).
130. Williamson II, 792 F.3d at 1350.
131. Id.
132. Id. at 1350–51 (citing MIT, 462 F.3d at 1344, 1354); id. at 1350 n.5 (citing Ranpak Corp. v. Storopack, Inc., 168 F.3d 1316, No. 98-1009, 1998 WL 513598 (Fed. Cir. July 15, 1998) (unpublished)).
133. Williamson II, 792 F.3d at 1351.
134. Id.
135. Id.
136. Id. (citing Function Media, L.L.C. v. Google, Inc., 708 F.3d 1310, 1319 (Fed. Cir. 2013)).
137. Williamson II, 792 F.3d at 1351–52, 1354 (citing Noah Sys., Inc. v. Intuit Inc., 675 F.3d 1302, 1311 (Fed. Cir. 2012)). The court recalled a two-step process whereby the claimed function must be first identified, followed by the claimed structure. The court found that the claim required a special purpose computer (e.g., “a general purpose computer programmed to perform particular functions”), and that no such structure was disclosed. Id. Expert testimony and displays of interfaces could not satisfy these requirements. Id.
III. APPLICATION OF WILLIAMSON II BY THE DISTRICT COURTS AND PTAB

The impact of the Williamson II decision has been expedient and immediate across the PTO and district courts. Over twenty PTAB decisions and over twenty district court decisions have cited it. In both the PTAB and district courts, Williamson II's elimination of Lighting World's strong presumption has facilitated a shift towards invoking § 112(f) against non-"means" claims.

A. APPLICATION OF WILLIAMSON II BY THE DISTRICT COURTS

The majority of federal court decisions citing Williamson II at the time this Note was written have been claim construction orders issued by district courts. The results of an empirical survey are summarized in Table 1.

<table>
<thead>
<tr>
<th>“Means”</th>
<th>Non-“means”</th>
</tr>
</thead>
<tbody>
<tr>
<td>112(f)</td>
<td>Non-112(f)</td>
</tr>
<tr>
<td>Pre-Williamson II</td>
<td>5 (83%)</td>
</tr>
<tr>
<td>Post-Williamson II</td>
<td>7 (78%)</td>
</tr>
</tbody>
</table>

The results show two metrics: (1) an absolute count of either first instances of an invocation of § 112(f) or a non-invocation of § 112(f) within a case, and (2) a percentage of invocation of § 112(f) and non-invocation of § 112(f), compared to an overall count. As observed from Table 1, the

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138. Because the vast majority of post-Williamson II cases have been district court cases, the analysis here focuses on the district courts.
139. For PTAB decisions including a decision on appeal in patent application (Decision on Appeal, Ex Parte Sebastian, No. 2013-006223, 2015 WL 4608191 (P.T.A.B. Sept. 30, 2015)) and a decision in Inter Partes Review (Decision Denying Institution of Inter Partes Review, Toyota Motor Corp. v. Cellport Sys., Inc, No. IPR2015-00634, 2015 WL 4934778 (P.T.A.B. Aug. 14, 2015)), see Appendix II. See Appendix I for district court cases considered both before and after Williamson II.
140. See supra Sections III.A–III.B.
142. See Theodore Eisenberg, Empirical Methods and the Law, 95 J. AM. STAT. ASS’N 665, 665–69 (2000). Due to the relatively small sample size of cases, caution should be exercised when drawing conclusions from this limited study. Id. at 668.
district courts appear more inclined to find that a non-"means" terms invokes § 112(f) after Williamson II than before.\footnote{143}

While Williamson II has been widely applied, it has not provided sufficient guidance to trial courts on how to apply the pre-Lighting World standard to determine when a claim term invokes § 112(f). The various rationales employed by the district courts demonstrate a need for clearer guidance. First, at least one court endorsed the use of dictionaries to determine whether a non-"means" claim term included sufficient structure.\footnote{144} More specifically, the court cited to Phillips to justify the use of dictionaries, so long as the dictionary definition did not contradict a definition within a patent specification.\footnote{145} The court found that the disputed term connoted structure based on several dictionaries.\footnote{146}

Second, some courts have cited to the Greenberg test referenced in Williamson II: “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.”\footnote{147} However, the test as applied in Greenberg was based on consistent dictionary definitions.\footnote{148} Although those court cases have nominally cited to Greenberg, they have applied tests from other cases that developed in the interim between Lighting World and Williamson II instead

\footnote{143. To evaluate the impact of Williamson II on the district courts, a Westlaw search was performed on all district court cases citing to Williamson II as of November 2, 2015, and all district court cases citing to Lighting World within a two-year period before Williamson II. For list of district court decisions, see Appendix I. Each case was reviewed to find an instance of at least one of four scenarios: whether (1) a "means" term invoked § 112(f), (2) a "means" term did not invoke § 112(f), (3) a non-"means" term invoked § 112(f), and (4) a non-"means" term did not invoke § 112(f). For the first occurrence of a scenario in a case, a count of that scenario was incremented. For example, if a given case invoked § 112(f) against one “means” term, a count of the scenario of invocation of § 112(f) against “means” terms was incremented by one. If the same case did not invoke § 112(f) against three “means” term, a count of the scenario of non-invocation of § 112(f) against “means” terms was incremented only once. This reduces bias in the data from cases where a large number of “means” or non-“means” terms were evaluated. Only the first instance of a scenario has been counted to avoid bias from a variable number of terms considered in each decision.}


\footnote{145. See id. at 479 (“[J]udges are free to consult dictionaries and technical treatises ‘at any time in order to better understand the underlying technology and may also rely on dictionary definitions when construing claim terms, so long as the dictionary definition does not contradict any definition found in or ascertained by a reading of the patent documents.’”).}

\footnote{146. See id.}

\footnote{147. Williamson II, 792 F.3d 1339, 1349 (Fed. Cir. 2015) (en banc).}

\footnote{148. Greenberg v. Ethicon Endo-Surgery, Inc., 91 F.3d 1580, 1583 (Fed. Cir. 1996).}
of the Greenberg test. For example, a court found several non-“means” terms to invoke § 112(f) while finding some other non-“means” terms to not invoke § 112(f). It found that the term “telecommunications interface module” connoted structure because of the adjectival qualifier “telecommunications interface.” This analysis, focusing on the adjectival qualifier, more closely resembles the analysis in the MIT case rather than the Greenberg case. Moreover, unlike Greenberg, no dictionaries were used to evaluate term “telecommunications interface.” The same court found that the terms “packetization module” and “echo cancellation module” did invoke § 112(f). The court noted that the terms as used in the claims could refer to any structure, but did not provide any clear reasoning to articulate why the terms could be so broad. The court also found that the terms “interworking agent” and “protocol agent” did not invoke § 112(f) based on implication from the patent specification that “agents” are recognized software structure. This test more closely resembles the analysis in Apple, which looked to the specification, instead of the one in Greenberg, which was based on objective understanding of a disputed term.

B. Application of Williamson II by the PTAB

A similar analysis as described above was performed to compare post-Williamson II PTAB and federal district court decisions. The results, tabulated in Table 2, suggest the PTAB is more inclined than district courts to invoke § 112(f) on non-“means” terms.

149. Supplemental Claim Construction Memorandum and Order, Genband USA LLC v. Metaswitch Networks Ltd., No. 2:14-CV-33-JRG-RSP, 2015 WL 4722185 at “13, *18 (E.D. Tex. Aug. 7, 2015) (finding that “packetization module[s] operable to . . . ” and “echo cancellation module[s] operable to . . . ” invoked § 112(f) and that “telecommunications interface module[s] operable to . . . ”, “interworking agent”, and “a first/second protocol agent for . . . ” did not invoke § 112(f)).

150. Id. at *13.

151. Id.

152. Id.

153. Id. at *12.

154. Id. at *17.

155. To evaluate the impact of Williamson II on the PTAB, a Westlaw search was performed on all PTAB cases citing to Williamson II as of November 2, 2015. See Appendix II for list of cases. Each case was examined to find a determination of at least one of four scenarios enumerated for the district court cases. For the first occurrence of a scenario in a case, a count of that scenario was incremented. Only the first instance of a scenario has been counted to avoid bias of the variable number of terms under examination in each PTAB hearing. The results are summarized in the table above, showing the absolute count of first instances within a case and percentage of overall counts between § 112(f) and non-112(f) instances.
Table 2: Invocation of § 112(f) in PTAB decisions citing to Lighting World.

<table>
<thead>
<tr>
<th>Post-Williamson II</th>
<th>“Means”</th>
<th>Non-“means”</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>112(f)</td>
<td>Non-112(f)</td>
</tr>
<tr>
<td>District Court</td>
<td>7 (78%)</td>
<td>2 (12%)</td>
</tr>
<tr>
<td>PTAB</td>
<td>11 (92%)</td>
<td>1 (8%)</td>
</tr>
</tbody>
</table>

In several of the cases, the PTAB has *sua sponte* advised patent owners and patent applicants alike against using nonce words, citing *Williamson II*. In contrast to the PTAB decisions, the district court decisions do not appear to have engaged in this *sua sponte* analysis. However, this may be a result of procedural differences between the PTAB and district courts.

Thus far, the PTAB has determined that two non-“means” terms do not invoke § 112(f). It found that the term “protocol translator” did not invoke § 112(f) simply because an examiner failed to present evidence to overcome the rebuttable presumption that a non-“means” term does not invoke § 112(f). It also found that the term “client dictionary” did not invoke § 112(f) based on the *Greenberg* test (reinstated by *Williamson II*). Specifically, the base term “dictionary” connoted sufficient structure based on multiple dictionary definitions. This analysis appears to track the methodology applied in *Greenberg*, albeit only on a base term, and not on the compound term “client dictionary.”

In the decisions that have invoked § 112(f) against non-“means” claim limitations, the PTAB has generally cited the test of whether a term conveys “sufficiently definite structure,” although it has not explicitly referenced *Greenberg* in all decisions. It conducted a two-part analysis to find that the term “digital pick up unit” invoked § 112(f), by separately considering

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158. See Decision on Appeal, *Ex parte* Sebastian, No. 2013-006223 at 12, 2015 WL 4608191 at *6 (P.T.A.B. Sept. 30, 2015) (“[W]e conclude a person of ordinary skill in the art would understand the term ‘client dictionary’ to be the name for structure, . . . .”).
159. See id.
160. See Decision on Institution of Inter Partes Review, Facebook, Inc., v. TLI Communications, LLC, No. IPR2015-00778 at 14, 2015 WL 5139353 at *9 (P.T.A.B. Aug. 28, 2015) (noting that the “term ‘unit’ is so broad that it does not convey sufficiently definite structure,” but not citing *Greenberg* v. Ethicon Endo-Surgery, Inc., 91 F.3d 1580 (Fed. Cir. 1996)); see also *Sebastian*, supra note 158, at 13, *7 (citing *Greenberg*).
the base term “unit” and adjectival qualifier “digital pick up.” It
determined that the base term “unit” was so broad as not to have sufficiently
definite structure, and concluded that the adjectival qualifier “digital pick
up” was functional and not structural. However, in conducting this test,
the PTAB did not appear to cite to any dictionaries.

The surveys of cases in the PTAB and district courts demonstrate that
since Williamson II overruled the Lighting World strong presumption, courts
have become more likely to invoke § 112(f) against non-“means” claims.
However, less apparent is whether the PTAB and district courts are
consistently applying the Greenberg test that the Williamson II court
reinstated.

IV. ISSUES UNADDRESSSED BY WILLIAMSON II

The Williamson II decision has made a clear impact on the patent world
by making it easier for district courts and the PTAB to invoke § 112(f)
against non-“means” claims by lowering the strength of the rebuttable
presumption to its level pre-Lighting World. However, while courts may
be citing to the Greenberg test set by Williamson II, they do not appear to be
uniformly applying the test. Guidance on the proper application of the
Greenberg test is necessary, especially for compound terms, including multi-
word adjectival qualifiers to a base term (e.g., “distribution learning control
module”). Such guidance is particularly necessary in view of common law
developed during tenure of strong presumption.

A. STATUS OF THE COMMON LAW DEVELOPED DURING THE
   TENURE OF THE STRONG PREEMPTION

A series of court cases expanded the scope of the strong presumption
during its decade-long tenure in at least two aspects: 1) shifting an objective
standard of interpreting claim terms to a subjective standard, and 2)
expanding the application of multi-word adjectival qualifiers to impart
structure to a term. Although Williamson II overruled the strong
presumption of Lighting World and overruled the heightened standard of
Flo Healthcare that a § 112(f) claim limitation be “devoid” of structure, it

161. See Decision on Institution of Inter Partes Review, Facebook, Inc., v. TLI
Commc’ns, LLC, No. IPR2015-00778 at 14, 2015 WL 5139353 at *7 (P.T.A.B. Aug. 28,
2015).
162. Id.
163. See supra Part III.
164. Id.
has not affected the disposition of the aforementioned two aspects of the post-\textit{Lighting World} common law.\footnote{Williamson II, 792 F.3d 1339, 1349 (Fed. Cir. 2015) (en banc).}

1. \textit{Williamson II Has Not Addressed a Shift from an Objective Standard of Interpreting Claim Terms to a Subjective Interpretation}

\textit{Williamson II} has not clarified whether its reference to the \textit{Greenberg} test also promotes a return to objective extrinsic evidence such as dictionary definitions over the intrinsic record. In view of the \textit{Phillips} methodology of first considering intrinsic evidence before extrinsic evidence, there may be some tension regarding primary reliance upon objective extrinsic evidence.

A first set of cases shifted the focus of claim interpretation from an objective standard (e.g., from dictionaries in \textit{Greenberg} and \textit{PMC}) to a subjective one based on a patentee’s specification. \textit{Phillips} laid the groundwork for the shift by emphasizing the intrinsic record such as the specification and prosecution history over the extrinsic sources, such as dictionaries and other documents.\footnote{Phillips v. AWH Corp., 415 F.3d 1303, 1320 (Fed. Cir. 2005) (en banc). The Federal Circuit stated: Although the concern expressed by the court in \textit{Texas Digital} was valid, the methodology it adopted placed too much reliance on extrinsic sources such as dictionaries, treatises, and encyclopedias and too little on intrinsic sources, in particular the specification and prosecution history.}

In \textit{Inventio}, the court found that the specification can impart structure to a claim term when determining whether the claim term invokes § 112(f).\footnote{Inventio AG v. Thyssenkrupp Elevator Ams. Corp., 649 F.3d 1350, 1356, 1358 (Fed. Cir. 2011).}

\textit{Apple}, the court built upon this line of reasoning to find that various “heuristic” terms connoted sufficient structure based on the description of inputs and outputs in the specification.\footnote{Apple, Inc. v. Motorola, Inc., 757 F.3d, 1286, 1304 (Fed. Cir. 2014).}

By this time, the Federal Circuit appeared to have departed from the once-objective standard of \textit{Greenberg} and \textit{PMC} that was at least grounded in objective evidence. Instead, it expanded to a standard where an applicant could draft patent specifications to include a functional description (e.g., input, output, and purported function) within a specification, and then obtain a functional claim by virtue of that inclusion. The dissent in \textit{Apple} points out this absurdity.\footnote{Id. at 1335–36 (Rader, C.J., dissenting).}

\textit{Williamson II} provides some guidance on the role of extrinsic evidence versus intrinsic evidence in determining whether non-“means” claim
limitations invoke § 112(f). In support of extrinsic evidence, the Williamson II court found the term “module” to be a well-known nonce word based on precedent from other cases. However, Williamson II also diminished the role of subjective extrinsic evidence by refusing to consider an expert declaration to create structure that is undisclosed within a patent specification.

2. Williamson II Has Not Clarified the Application of Multi-Word Adjectival Qualifiers to Impart Structure to a Term

A second set of cases expanded the scope of multi-word adjectival qualifiers that did not invoke § 112(f). MIT expanded the scope of the Apex decision such that the base term “circuit,” considered a structural term, combined with nearly any “description of the function of the circuit” would result in a structural term. Flo Healthcare subsequently extended MIT to use compound adjectival qualifiers, such as “height adjustment” to impart structure to non-structural base terms such as “mechanism.” Although Flo Healthcare might mirror Greenberg’s analysis at first glance, Flo Healthcare only considered a portion of a multi-word adjectival qualifier (“adjustment” instead of “height adjustment”), compared to Greenberg, which considered a single word (“detent”).

Williamson II has not clarified how courts should evaluate adjectival qualifiers. Williamson II found that the compound adjectival qualifier “distributed learning control” did not impart sufficient structure to the base term “module” but did not provide clear reasoning to explain why it was insufficient.

In view of MIT, Flo Healthcare, and Apple, the current methodology for evaluating compound terms appears to be a two-part analysis that first considers the base term and then considers the compound adjectival qualifier. If a base term is sufficiently structural (e.g., circuit), then the compound term is deemed to be structural without further analysis of the adjectival qualifier, regardless of whether an objective definition of the

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170. Williamson II, 792 F.3d at 1350.
171. Id. at 1351.
172. MIT, 462 F.3d, 1344, 1355–56 (Fed. Cir. 2006).
174. The disputed term in Flo Healthcare was “height adjustment mechanism” while the disputed term in Greenberg was “detent mechanism.” See id.; Greenberg, 91 F.3d at 1583–84. The adjectival qualifiers “adjustment” and “detent” were construed using dictionaries. Id.
175. Flo Healthcare, 697 F.3d at 1374–75.
176. Williamson II, 792 F.3d 1339, 1351 (Fed. Cir. 2015) (en banc).
adjectival qualifier is ascertainable. Courts may determine the structural character of a base term (e.g., “heuristic”) by examining the intrinsic record. If a base term (e.g., a nonce word such as “mechanism”) does not connote structure, then the adjectival qualifier is considered. If the adjectival qualifier has a portion (e.g., “adjustment” from “height adjustment”) that can be deemed to be structural, then the entire term may be deemed structural.

Accordingly, two issues that require clarification after Williamson II are (1) the role of extrinsic evidence versus intrinsic evidence in the construction of a base term and adjectival qualifiers, and (2) whether construction of portions of adjectival qualifiers is sufficient to determine that the whole adjectival qualifier connotes sufficient structure.

B. STANDARD OF WHAT INDICATES SUFFICIENT STRUCTURE TO ONE OF ORDINARY SKILL IN THE ART

Courts may apply the three pre-Lighting World criteria to provide a framework to determine whether a non-“means” claim term invokes § 112(f) in view of the common law developments discussed in Section IV.A. The three criteria are: (1) whether the disputed claim term connotes any structure by its plain meaning, (2) whether the claim limitation recites any structure, and (3) whether the claim limitation includes a function linked to the “means.” The proposed framework provided here assumes that a disputed claim term is a compound term consisting of a base term and an adjectival qualifier. The proposed framework would also notify patent applicants on how to draft claims to use objectively understood structural terms to avoid invocation of § 112(f).

1. Application of the First Pre-Lighting World Criterion Should Be Modified to Construe Whole Adjectival Qualifiers Based on Consistent Objective Evidence

Courts applying the first criterion have used objective evidence in the form of consistent dictionary definitions to determine whether a claim term

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177. MIT, 462 F.3d at 1355–56.
179. Flo Healthcare, 697 F.3d at 1374–75.
180. Id.
183. See York Prods., Inc. v. Cent. Tractor, 99 F.3d 1568, 1574 (“means formed on . . . sidewall portions including . . . ridge members”).
had a clear meaning that connoted structure to one of ordinary skill. In
*Greenberg*, adjectival qualifiers could still impart structure to a disputed
nonce term. In this proposed framework, courts use objective evidence in
the form of consistent dictionary definitions to construe whole compound
terms (including adjectival qualifiers and base terms), unless the patent
specification defines the disputed term in non-functional terms. If the
patent specification includes a definition of a claim term in non-functional
terms, the claim term may be construed under non-112(f) doctrine of
equivalents based on the definition.

This approach is consistent with *Greenberg* because both approaches
permit construction of adjectival qualifiers, although the proposed
framework also requires courts to construe the entirety of an adjectival
qualifier instead of portions. This requirement brings clarity to construction
of long claim terms. If courts cannot find an objective definition for a claim
term containing a long adjectival qualifier from objective sources, then one
of ordinary skill in the art would likely not have understood what the claim
term meant. Accordingly, courts should restrict such a long claim term to
the definitions and embodiments disclosed within the specification.
*Greenberg* was silent on this issue as it considered only single word adjectival
qualifiers. The proposed framework is consistent with the *Phillips*
decision because it first considers definitions from the intrinsic record (e.g., the
patent specification), subject to the exclusion of functional definitions.

The construction of the entire adjectival qualifier would help curtail
drafting techniques that use non-structural functional adjectives to modify
structural terms (e.g., "aesthetic correction circuitry") in attempting to avoid
§ 112(f) classification. It also removes bias about selectively construing
portions of lengthy adjectival qualifiers. The provision for definitions with
a patent specification still permits a patentee to be its own lexicographer in
drafting a patent. The restriction on non-functional definitions curtails the
black box claiming issues in *Apple* whereby patentees defined structure in
functional form (e.g., by defining inputs and outputs for a term instead of
clear implementations).

The use of objective extrinsic evidence helps to maintain a level of
uniform clarity across patents. If a disputed term is not objectively
understood based on public technical references, then it should not meet
the *Williamson II* standard that "words of the claim are understood by

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184. See *Greenberg*, 91 F.3d at 1583. The court found that “detect mechanism” did not
invoke § 112(f). Id. But see *Williamson II*, 792 F.3d 1339, 1351 (Fed. Cir. 2015) (en banc)
(classifying “mechanism” as a nonce word).
persons of ordinary skill” as “the name for structure.” Moreover, the Williamson II court’s citation of Greenberg and other pre-Lighting World cases in the declaration of its standard might be interpreted as an endorsement of pre-Lighting World methodology. The proposed framework permits some flexibility in definition consistency since a unanimous consensus for a definition may not always be possible.

i) Implementation of the Framework

Overcoming the lower post-Williamson II rebuttable presumption still presents a challenger with a difficult task: proving negative conditions that a claim term “fails to ‘recite sufficiently definite structure’” or that words of a claim are not understood by persons of ordinary skill in the art. Accordingly, in order to limit functional claiming in the context of this rebuttable presumption, limits should apply to counterarguments that a patentee/applicant may present after initial arguments presented by a challenger. The proposed framework follows these steps:

1. A challenger first provides arguments to overcome the rebuttable presumption that § 112(f) does not apply to a non-“means” term.

2. The burden then shifts to the patentee to demonstrate that a non-“means” term is clearly understood by one of ordinary skill in the art. Limits would be placed on the patentee’s response according to the three criteria discussed in Sections I.C.1(a)–(c).

A challenger may provide initial arguments on a base term and an adjectival qualifier. The challenger might argue that a base term is a nonce term (e.g., “mechanism,” “element”) by citing to precedent in other cases. The challenger might also argue that the entirety of an adjectival qualifier does not connote a well-known meaning if the whole qualifier cannot be discerned consistently from objective sources such as dictionaries. After the challenger submits its initial argument, the burden shifts to the patentee/applicant to demonstrate that the disputed claim limitation does describe sufficiently definite structure.

At this procedural step, in view of the difficulty for a challenger to prove a negative condition to rebut the presumption and to provide a clear and objective standard for construing a claim term, courts may apply the modified first criterion proposed above to require construing a whole

185. See Williamson II, 792 F.3d at 1349 (citing Greenberg, 91 F.3d at 1583; Watts, 232 F.3d at 880; PMC, 161 F.3d at 703) (emphasis added).

186. Id.

187. Id. (emphasis added).
adjectival qualifier instead of portions of the claim term. As discussed above, this curtails drafting techniques that add non-structural functional modifiers to structural base terms and provides a clear objective standard for patent applicants and patent challengers to construe terms. Accordingly, patentees/applicants would not be able to selectively construe portions of an adjectival qualifier and would be on notice to draft claims accordingly. Furthermore, definitions within a patent specification may be relied upon, so long as said definitions are not in functional form. This places another restriction against using drafting techniques to cloak functional limitations as structure. Additionally, this provides a clear framework for determining whether a claim term invokes § 112(f), brings clarity to claim construction, and also puts potential infringers on notice.

2. Application of the Second Pre-Lighting World Criterion Depends in Part on the Interpretation of the Objective Evidence Under the First Pre-Lighting World Criterion

The second criterion is partly a variation of the first because it looks to other claim terms within the limitation to impart structure to the claim limitation as a whole, instead of examining the plain meaning of a disputed claim term. The second criterion may ultimately reduce to an inquiry on whether other terms with a claim limitation connote sufficient structure to impart structure to the limitation as a whole. In such a case, courts should apply the proposed analysis set forth under the first criterion in order to determine whether other terms within the claim limitation are understood by one of ordinary skill to connote structure.

3. The Third Pre-Lighting World Criterion Alone Is Not Dispositive in Overcoming a Rebuttable Presumption that a Disputed Term Does Not Invoke § 112(f)

The third pre-Lighting World criterion considers whether a disputed claim term recites a function. Although the absence of a function suggests that a disputed limitation does not invoke § 112(f), the presence of a function within a disputed limitation does not necessarily indicate that the disputed limitation should invoke § 112(f). For example, courts have found that a claim limitation that recites a structural term and a function does not invoke § 112(f). Accordingly, although the third criterion indicates that a non-“means” term that lacks a function may not invoke § 112(f), it does

188. See Al-Site, 174 F.3d 1308, 1318 (Fed. Cir. 1999) (finding that “eyeglass hanger member . . . made from flat sheet material” did not invoke § 112(f)).
189. See Apex, Inc. v. Raritan Computer, Inc., 325 F.3d 1364, 1372 (“[A] first interface circuit for receiving keyboard and cursor control device signals from the workstation.”).
not provide sufficient information to fully rebut a presumption that § 112(f) does not apply to a disputed claim limitation.

V. CONCLUSION

Williamson II is a large step forward in addressing the problem of overly broad functional claiming. However, while Williamson II has overruled the strong presumption, it has not fully addressed other common law doctrines that have developed during the tenure of the common law strong presumption. Most notably, while Williamson II reasserts Greenberg’s approach of determining whether a term is understood by a person of ordinary skill to have structure, Williamson II does not address the expansion via MIT and Apple, which used functional adjectival qualifiers to support structural determination of compound terms that are not conventional nonce words (e.g., “heuristic”). Furthermore, Williamson II does not address the role of objective versus intrinsic evidence in determining whether a term invokes § 112(f). A proposed framework based on pre-Lighting World criteria would help implement the Greenberg approach set by Williamson II.
APPENDIX I: LIST OF DISTRICT COURT CASES

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### Pre-Williamson II Cases (citing to Lighting World in prior 2 years)

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**APPENDIX II: LIST OF PTAB CASES CONSIDERED**

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