

Indefiniteness Considerations for Functional Claiming in the Electrical and Computer Arts

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Introduction

Functional claiming issues have bedeviled patent practitioners in the electrical and computer arts in recent years. In *Williamson v. Citrix Online*,² the Federal Circuit weakened the strong presumption against the application of 35 USC §112(f) against claim language that did not use the word “means.” After *Williamson*, Examiners began interpreting claim language under §112(f) even when practitioners did not intend such interpretation, and indefiniteness rejections were made whenever it was alleged that adequate corresponding structure could not be found in the specification.

The paper provides the current state of the law of functional claiming, including case law updates after *Williamson*. This paper also provides some insight and practical tips into how to avoid indefiniteness rejections once claims have been interpreted to fall under §112(f).

I. Indefiniteness in Functional Claiming before *Williamson*

When Congress revised the patent law with the 1952 Patents Act, means-plus-function claiming was written into the statute. This explicitly permitted functional claiming, limiting the scope of such claims to the structure and its equivalents as disclosed in the specification.

Below is the statute as it reads currently. When structure is not recited in a claim, the claim is construed as covering the structure and equivalents described in the specification:

35 USC §112(f) (formerly §112(6))

- ELEMENT IN CLAIM FOR A COMBINATION.—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.
- 35 USC §112(f) permits use of means-plus-function claiming of combinations. A single element means-plus-function claim is not permitted.

After the 1952 Patent Act, means-plus-function claiming was popular with patent practitioners, but it in many instances, it was used improperly. This improper use might have been due to an overly-optimistic interpretation of “equivalents” or overly-lax enforcement by the USPTO. In any case, *In re Donaldson* tightened up the prevailing practice by making it clear that the scope of means-plus-function claims was to be limited to structure and its equivalents that are named in the specification.

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² *Williamson v. Citrix Online, LLC*, 115 USPQ2d 1105 (Fed. Cir. 2015).

Intentional use of means-plus-function claiming has been steadily decreasing, but continues to arise in litigation. Indeed, one study found that about one-fourth of claim construction opinions involve means-plus-function limitations, and in about half these cases, the court will have to determine whether §112(f) interpretation should apply. This is likely because prosecutors now tend to replace “means for” language with other terms, coupling them with functional language. Thus, courts must decide whether certain terms, such as “module,” “mechanism,” “element,” and “device” serve the same purpose as “means for” language.

A claim element that uses the word “means” is presumed to invoke §112(f). This presumption is only rebutted when the claim element also includes structure – in other words if the claim element is not functional. Conversely, at least before *Williamson*, a claim element that does not use the word “means” is presumed to not invoke §112(f), unless it fails to recite “sufficiently definite structure” If §112(f)-type construction is not used, then the *Phillips* construction is used. Under *Phillips*, claim terms are “generally given their ordinary and customary meaning” and “the ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention.”³

USPTO Examiners were trained on §112(f) after the 2013 Software Partnership Roundtables.⁴ The training was divided into four modules. Modules one and two are beyond the scope of this paper. The third module described findings of indefiniteness once §112(f) has been applied. When an Examiner determines that a claim should be interpreted under §112(f), this finding in and of itself does not necessarily lead to a §112(b) rejection. The Examiner is then instructed to look in the specification for corresponding structure. If there is no corresponding structure, then the Applicant could get a §112(b) (indefiniteness) rejection.

The plain meaning of terms in the claim are used to determine whether those terms constitute sufficient structure to avoid interpretation under §112(f). Corresponding structure has to be disclosed in such a way that one of ordinary skill would understand what structures perform the claimed functions.

The fourth module of training involved evaluating software-related claims under §112(f). As the Examiners learned, programmed computer functions require a computer programmed with an algorithm⁵ to perform the function. The algorithm can be expressed “in any understandable terms including as a mathematical formula, in prose or as a flow chart, or in any other manner that provides sufficient structure.”⁶ As will be described later in the Practice Tips section, when programmed computer functions are claimed, it is a good idea to provide algorithms in the specification in the event that the Examiner applies a §112(f) interpretation to any of the claims presented in the application.

In addition, as was discovered with *Williamson* and other cases,⁷ the structures and the level of description needed will vary depending on whether functions can be performed by a

³ *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312-1313 (Fed. Cir. 2005).

⁴ See <http://www.uspto.gov/video/cbt/BRI/>; <http://www.uspto.gov/video/cbt/sftwrevaluate/index.htm>; <http://www.uspto.gov/video/cbt/identify-limit/index.htm>; <http://www.uspto.gov/video/cbt/make-record/index.htm>

⁵ An algorithm is a step-by-step procedure for accomplishing a given result.

⁶ *Finisar*

⁷ *Aristocrat Technologies Australia Pty Ltd. v. International Game Technology*, 521 F.3d 1328 (Fed. Cir. 2008), required that the disclosed structure must be more than a general purpose computer or microprocessor; instead, the structure is “not the general purpose computer, but rather the special purpose computer programmed to perform the disclosed algorithm.” An exception to the “*Aristocrat* rule” was set forth in *Katz Interactive Call Processing Patent Litigation v. American Airlines, Inc.*, 639 F.3d 1303 (Fed. Cir. 2011), which held that when a function can be achieved by any general purpose computer without special programming, then no algorithm need be disclosed. Katz was

general purpose computer or are performed by a specifically-programmed computer. Specialized functions are functions other than those commonly known in the art, often described by courts as requiring “special programming” for a general purpose computer or computer component to perform the function. Non-specialized functions are known by those of ordinary skill in the art as being commonly performed by a general purpose computer or computer component.

The structure in the specification that supports a §112(f) limitation reciting a specialized function can be a general purpose computer programmed according to an algorithm. However, it is not sufficient to state that one of ordinary skill could devise this algorithm. Instead, the algorithm itself must be provided, in detail, in order to avoid §112(b) indefiniteness.

The training also described what is meant by non-specialized functions and what support is required to avoid rejections under §112(b) for non-specialized functions. In short, general functions can be accomplished by a general purpose computer with no special programming, and no algorithm is required in order to avoid §112(b) rejection. On the other hand, if special programming is required, the specification has to disclose the (detailed) algorithm to avoid a §112(b) rejection.

For a while, Applicants could typically avoid §112(f) treatment just by avoiding the use of “means” language. However, in June 2015, software claims began to receive harsher treatment and were interpreted under §112(f) even when it was not the Applicants’ desire or intent. Those Applicants who did not provide the required structure found themselves in a bind.

II. *Williamson*

Williamson was the first decision to introduce these difficulties. The patent in question described methods for distributed learning that utilized industry-standard computer hardware and software, linked by a network, to provide a virtual classroom environment. At issue was the claim term shown here:

“a distributed learning control module for receiving communications 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”

Sitting *en banc*, the Federal Circuit withdrew its earlier opinion and reversed the precedent from *Lighting World* and *Inventio* creating a “strong” presumption that a limitation does not invoke §112(f) unless the word “means” is used. Instead, the new standard would be “whether the words of the claim are understood by a person of ordinary skill in the art to have a sufficiently definite meaning as the name for a structure.”⁸

remanded for the district court to construe the terms “processing,” “receiving,” and “storing” and to determine based on its construction whether those functions could be performed by a general purpose processor. However, the Katz exception can be applied only sparingly. As noted in *EON Corp. IP Holdings LLC v. AT&T Mobility LLC*, 785 F.3d 616 (Fed. Cir. 2015), the exception in Katz is “rare” and further clarified two things: (1) “special programming” has nothing to do with how complex or simple the function is to implement but rather “includes any functionality that is not ‘coextensive’ with a microprocessor or general purpose computer,” and (2) whether an algorithm is required or not does not depend on the POSITA, who comes in only if “the specification discloses an algorithm that the accused infringer contends is inadequate.”

⁸ *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1348 (Fed. Cir. 2015)

Here, the word “module” did not indicate structure. Instead, it was deemed to represent a black box recitation of structure. The court looked to the specification for corresponding structure and did not find it. Therefore, the claim was pronounced indefinite.⁹

As was mentioned in a case subsequent to *Williamson*, an expert declaration failed to describe how the distributed learning control module, by its interaction with the other components in the distributed learning control server, is understood as the name for structure.”¹⁰ The bottom line is: the algorithm needs to be set forth in the specification (as was also pointed out to the Examiners during the training discussed above).

Additionally, the court pointed out that when multiple functions were claimed, a structure must be disclosed to perform each claimed function.¹¹ Practitioners must link any structure in the specification to the claimed function, and any structure must be “adequate” to achieve the claimed function.¹² The court also discussed the option of providing inputs and outputs in the claim language. If the claim had described how the distributed learning control module interacted with other modules, that might have informed the structural character of the limitation or otherwise impart structure.¹³

The dissent in *Williamson* was interesting as well. Judge Newman opined that the holding would serve only to increase patent holders’ uncertainty. As pointed out by Judge Newman, the statute particularly spells out the need to have “means for” to apply the presumption. According to Judge Newman, that is the only way §112(f) should be invoked. To change this presumption now would only lead to more uncertainty for Applicants.

III. Means-Plus-Function Case Law after *Williamson*

When functional claiming is used, leaving out the term “means” may not always serve to rebut the presumption against invoking §112(f). Since *Williamson*, the district courts have had many opportunities to address this issue. Particularly interesting, at least from the point of view of software patent practitioners, is that several (though not all) courts have held that using the word “processor” does not necessarily invoke means-plus-function interpretation. Some of these cases are discussed below.

A. *Enfish, LLC v. Microsoft*¹⁴

Enfish is often analyzed in terms of its effects on patent eligibility. *Enfish* also has implications for means plus function claiming. In *Enfish*, Microsoft requested that some claims be found indefinite on grounds of indefiniteness.¹⁵ According to Microsoft, a previously-recited four-step algorithm should not be considered sufficient structure for the claimed function of “configuring said memory according to a logical table.”¹⁶ As noted by the court, for a functional claim element “the specification must contain sufficient descriptive text by which a person of skill

⁹ *Id.* at 1351.

¹⁰ *Id.*, at 1351.

¹¹ *Id.*

¹² *Id.* at 1352.

¹³ *Id.*

¹⁴ <http://www.cafc.uscourts.gov/sites/default/files/opinions-orders/15-1244.Opinion.5-10-2016.1.PDF>

¹⁵ *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1339.

¹⁶ *Id.*

in the field of the invention would ‘know and understand what structure corresponds to the means limitation.’”¹⁷

The district court had found that the four-step algorithm sufficiently identified structure, and the Federal Circuit agreed. The first part of the algorithm relied on well-known techniques in the database arts, and the other parts provided details for modifying well-known configurations. According to the Federal Circuit, the fact that the algorithm relied partly on techniques known to those of ordinary skill “does not render the composite algorithm insufficient under §112(f). Indeed, this is entirely consistent with the fact that the sufficiency of the structure is viewed through the lens of a person of skill in the art and without need to ‘disclose structures well known in the art’”.¹⁸

B. *Electric Power Group, LLC, v. Alstom*¹⁹

Electric Power Group is often analyzed for its impact on patent eligibility issues. *Electric Power Group* also has implications for means-plus-function claiming. Patent practitioners should read *Electric Power Group, LLC, v. Alstom* to understand the importance of claiming how things are done, rather than just claiming which things are done.

The claims in *Electric Power Group* were directed to “systems and methods for performing real-time performance monitoring of an electric power grid by collecting data from multiple data sources, analyzing the data, and displaying results.”²⁰ The district court granted summary judgment that the subject matter of the claims failed tests for patent eligibility, and the Federal Circuit affirmed. The court applied the two-step test specified in *Alice*, and found in the first step that the claims were “directed to the abstract idea of “monitoring and analyzing data from disparate sources.”²¹ In analyzing the second step, the Federal Circuit examined the claim elements and did not find anything “sufficient to remove the claims from the class of subject matter ineligible for patenting.”²² The court pointed out that most of the steps involved enumerating types of information and selection information, which the court considered to be mental steps “whose implicit exclusion from §101 undergirds the information-based category of abstract ideas.”²³

The decision seemed to imply that requiring a “new source or type of information, or new techniques for analyzing it,” might have been patent eligible.²⁴ Further, the claims might have been saved if they required a “non-conventional and non-generic arrangement of known, conventional pieces,” rather than just generic computer components and display devices.²⁵

Further, the claims may have been found eligible if they required some sort of inventive programming. This concept seems to tie in with functional claiming concepts, in that a specifically-programmed computer claim might have been found eligible, and would have also passed indefiniteness issues if detailed algorithms were presented in the specification.

¹⁷ *Id.*

¹⁸ *Id.*

¹⁹ <http://www.cafc.uscourts.gov/sites/default/files/opinions-orders/15-1778.Opinion.7-28-2016.1.PDF>

²⁰ *Elec. Power Group, LLC v. Alstom S.A.*, Case No. 2015-1778 (Fed. Cir. Aug. 1, 2016) at 2.

²¹ *Id.* at 5.

²² *Id.* at 10.

²³ *Id.*

²⁴ *Id.*

²⁵ *Id.* at 11.

The court commented that “result-focused functional character of claim language has been a frequent feature of claims held ineligible under §101, especially in the area of using generic computer and network technology to carry out economic transactions.”²⁶ It would appear that functional language can lead to both 35 USC §101 rejections as well as indefiniteness rejections, a recurring theme in this area of patent law.

C. *Media Rights Technologies, Inc. v. Capital One Financial Corp.*²⁷

Claim 1, recited in part below, was at issue:

Claim 1: A method of preventing unauthorized recording of electronic media comprising:
activating a compliance mechanism in response to receiving media content by a client system...

The Federal Circuit affirmed indefiniteness of the claim term “compliance mechanism.” *Media Rights* appears to be very similar to *Williamson* in that it begins by stating that “compliance mechanism” does not suggest structure, and therefore the claim should be construed as a means-plus-function claim under §112(f).²⁸ *Media Rights* goes even further by looking at every function claimed to be performed by that compliance mechanism, and looking for sufficient structure for each of those functions.

The appellant conceded that “compliance mechanism” did not have a commonly understood meaning and is not generally viewed as connoting a particular structure. However, the appellant tried to compare “compliance mechanism” with a similar term used in *Inventio*, “modernizing device.” *Inventio* was distinguished in that the modernizing device functions were performed by an electrical circuit that had inputs and outputs. On the other hand, the “compliance mechanism” in *Media Rights* was not a substitute term for an electrical circuit or any other structure. In addition, *Inventio* was decided pre-*Williamson* and thus benefited from the “strong” presumption standard still in play for determining whether §112(f) should apply.

The court in *Media Rights* might have decided the other way if algorithms for each of the functions were set forth in the specification. Moreover, describing inputs and outputs for the “compliance mechanism” might have made limitation sufficiently similar to a circuit and therefore more in line with *Inventio*’s outcome.

D. *Collaborative Agreements, LLC v. Adobe Sys.*²⁹

In *Collaborative Agreements*, Adobe filed a motion requesting that the claims be construed in light of the *en banc* decision in *Williamson*.³⁰ Adobe requested reconsideration of the terms “code segment” and “computer readable medium encoded with a computer program.”³¹ Under the *Williamson en banc* decision, Adobe had the burden of showing that the disputed claim terms failed to recite sufficient structure, but noted that they did not intend every use of software

²⁶ *Elec. Power Group, LLC v. Alstom S.A.*, 2016 US App. LEXIS 13861, 13-15 (Fed. Cir. Aug. 1, 2016)

²⁷ *Media Rights Technologies, Inc. v. Capital One Financial Corp.*, 800 F.3d 1366 (Fed. Cir. September 4, 2015)

²⁸ *Id.* at 1375.

²⁹ *Collaborative Agreements, LLC v. Adobe Sys.*, 2015 US Dist. LEXIS 161809 (N.D. Cal. Dec. 2, 2015)

³⁰ *Id.* at 3.

³¹ *Id.* at 4.

terminology (e.g., “code segment”) in a claim should result in a means-plus-function limitation.³² Instead, Adobe argued that, when there is not enough information about how the software operates, the use of the term “software,” or something akin to that term, essentially becomes functional without a “sufficiently definite structure.” The court was not persuaded by Adobe’s argument. The court believed the term “code segment” suggested some kind of structure according to a dictionary definition provided by Collaborative Agreements, which stated that “code segment” is a memory segment containing program instructions.³³ Furthermore, the court thought the language in the claim did not simply describe broadly phrased high-level functions but instead described structural interactions among code segment components, as can be seen in representative claim 25 below.

25. A non-transitory computer readable medium encoded with a computer program for facilitating a transaction between two or more parties comprising:
a code segment for receiving one or more electronic documents ...;
...
a code segment for posting the received electronic documents to ...;
a code segment for providing the second party with access to the received electronic documents....³⁴

In the end, claim 25 was likened to a claim reciting a circuit in the *Linear Tech*³⁵ case. The court in *Linear Tech* similarly looked to the definition of “circuit,” and then to interactions (inputs/outputs) between various portions of the circuit before holding that the circuit was sufficient structure and that the claim therefore should not be interpreted as a means-plus-function claim.

E. *SyncPoint Imaging, LLC v. Nintendo of Am. Inc.*³⁶

SyncPoint was a dispute in which use of the term “processor” was held to not invoke a means-plus function interpretation.³⁷ In reaching this conclusion, the court discussed *Personal Audio*,³⁸ which read *Aristocrat*³⁹ as holding that when a claim discloses a “processor” alone, it does not provide sufficient structure to avoid invoking a means-plus-function interpretation. However, after *Personal Audio*, the Federal Circuit held that *Aristocrat* applies only after 35 USC §112(6) has been invoked, and should not be used to determine whether 35 USC §112(6) should be invoked in the first place. The same point was made in *Apple Inc. v. Motorola, Inc.*⁴⁰ where the court stated:

The district court misapplied our precedent by requiring the claim limitations of the '949 patent themselves to disclose a step-by-step algorithm as required by *Aristocrat Technologies*. *Aristocrat* and related cases hold that, if a patentee has

³² *Id.* at 13.

³³ *Id.* at 13-14.

³⁴ *Id.* at 12-13.

³⁵ *Linear Tech. Corp. v. Impala Linear Corp.*, 379 F.3d 1311 (Fed. Cir. 2004).

³⁶ *SyncPoint Imaging, LLC v. Nintendo of Am. Inc.*, 2016 US Dist. LEXIS 677 (E.D. Tex. Jan. 5, 2016)

³⁷ *Id.* at 55.

³⁸ *Personal Audio, LLC v. Apple Inc.*, No. 9:09-cv-00111, 2011 US Dist. LEXIS 157778, at *60-*63, *68-*72, n.13 (E.D. Tex. Jan. 30, 2011).

³⁹ *Aristocrat Techs. Australia Pty Ltd. v. Int'l Game Tech.*, 521 F.3d 1328 (Fed. Cir. 2008).

⁴⁰ *Apple Inc. v. Motorola, Inc.*, 757 F.3d 1286, 1298 (Fed. Cir. 2014).

invoked computer-implemented means-plus-function claiming, the corresponding structure in the specification for the computer implemented function must be an algorithm unless a general purpose computer is sufficient for performing the function.

In all these cases, the claims recited the term "means," thereby expressly invoking means-plus-function claiming. In addition, the parties in these cases did not dispute on appeal that these claims were drafted in means-plus-function format. Hence, where a claim is not drafted in means-plus-function format, the reasoning in the Aristocrat line of cases does not automatically apply, and an algorithm is therefore not necessarily required. The correct inquiry, when 'means' is absent from a limitation, is whether the limitation, read in light of the remaining claim language, specification, prosecution history, and relevant extrinsic evidence, has sufficiently definite structure to a person of ordinary skill in the art.⁴¹

The court also cited *Smartflash*⁴² for holding that while "processor" may not define a specific structure, it defines a class of structures, and that "processor" therefore was not a nonce word and means-plus-function interpretation should not automatically apply.

F. *Advanced Ground Info. Sys. V. Life360, Inc.*⁴³

Advanced Ground Info addressed whether asserted claims containing the phrase "symbol generator" should be considered in means-plus-function form, pursuant to 35 USC §112, ¶ 6.⁴⁴ Citing to *Williamson*, the court stated that the failure to use the word "means" creates a rebuttable presumption that 35 USC §112(6) does not apply. The circuit court agreed with the district court that the term "symbol generator" is analogous to a "means for generating symbols" because the term is simply a description of the function performed.⁴⁵ The circuit court also agreed with the district court that the term was not used "in common parlance" to designate structure.

There was also an apparent tie to patent eligibility analysis when the court stated that the term "symbol generator" "fails to describe a sufficient structure and otherwise recites abstract elements for causing actions." Upon finding the phrase "symbol generator" to invoke means-plus-function interpretation, the court found the claim indefinite because the specification did not contain an adequate disclosure of the structure corresponding to the claimed function. An algorithm for performing the functions of a "symbol generator" might have provided sufficient structure to avoid the indefiniteness rejection in this case.

⁴¹ *Id.*

⁴² *Smartflash LLC v. Apple Inc.*, 77 F. Supp. 3d 535 (E.D. Tex. Dec. 4, 2014).

⁴³ *Advanced Ground Info. Sys. v. Life360, Inc.*, 2016 US App. LEXIS 13707, 7-8 (Fed. Cir. July 28, 2016).

⁴⁴ *Advanced Ground Info.* at 7.

⁴⁵ *Id.* at 10.

IV. Practice Tips for Functional Claiming after *Williamson*

A. Avoidance of nonce words, with a word of caution

When a §112(f) interpretation is not desired, practitioners should avoid the use of nonce words. Nonce words are defined in the context of functional claiming as words that will lead to a §112(f) interpretation. MPEP §2181 provides a list of known nonce words, and a list of words held not to be nonce words. It should be kept in mind that this list was formulated pre-*Williamson*, and accordingly it may not be sufficient to avoid these words, and no others. Rather, the entire discussion in this section should be taken into account.

First, a list of known nonce words:

- mechanism for
- module for
- device for
- unit for
- component for
- element for
- member for
- apparatus for
- machine for
- system for

Next, a list of words (or phrases) held not be nonce words:

- circuit for
- detente mechanism
- digital detector for
- reciprocating member
- connector assembly
- perforation
- sealingly connected joints
- eyeglass hanger member

As can be seen by comparing the two lists above, all the nonce words end with “for.” It might appear on first glance that, by avoiding the use of “for” with or without the word “means” practitioners can avoid §112(f) treatment. However, some non-nonce words phrases include the term “for” at the end. Some of the non-nonce words do appear to be structures, but the same could be said for some of the phrases in the list of nonce words. Additionally, the list of known nonce words may be misleading because, after *Williamson*, some Examiners started treating the phrase “configured to” similarly to the word “for.” In other words, any noun followed by the phrase “configured to” may be at risk of interpretation as a nonce word. However, this is not universal among Examiners, and some practitioners are of the opinion that “configured to” is still less likely than “for” to trigger the use of §112(f).

In general,⁴⁶ if the noun preceding “configured to” or “for” would seem to a layperson to go together with the operation provided in the claim limitation, then the Examiner may be less likely to apply §112(f) treatment. For example, the following hypotheticals should be less likely to trigger 112(f) scrutiny:

- a receiver configured to receive input
- a processor configured to calculate a score
- a GUI configured to display a menu
- a controller configured to manage the device

If the noun and operation seem to be mismatched or disconnected, then the claim is at risk of treatment under §112(f). If it is unclear whether a noun could perform the operation (without a specialized algorithm), then Examiners are more likely to treat the noun as a nonce word. Consider the following hypotheticals:

- a receiver configured to convert a signal
- a processor configured to predict a preference
- a GUI configured to select a menu option
- a controller configured to map a device to another device

In such cases, an Examiner might argue that the specification should provide two things (1) some structure corresponding to the noun, and (2) an algorithm that the noun could perform to accomplish the operation. For example, the receiver might need to execute a conversion algorithm to convert the signal in the first example above. The processor might need to perform according to a prediction algorithm, etc.

As one colleague put it, nouns seem less likely to be treated as nonce words if the operations they perform do not sound too amazing or surprising. However, a word of caution is in order. If the operation is meant to be novel (i.e., amazing and/or surprising), then practitioners should refrain from trying to overcome §112(f) treatment by arguing that the noun goes together with the claimed operation. Doing otherwise risks an obviousness rejection, especially if one of ordinary skill in the art would understand the noun and operation as being joined together, as part of their natural or inherent characteristics.

To summarize the above points, nouns should seem capable of performing the claimed operations without special programming, if §112(f) treatment is to be avoided. However, care should be taken when amending to overcome prior art rejections because, unless there is support in the specification for novel algorithms, §112(f) treatment and an indefiniteness rejection may result.

B. Patent examination war stories

Real-world interaction with Examiners regarding means-plus-function interpretation was investigated. The author polled colleagues and studied recent office action responses to uncover §112(f) war stories. As the author anticipated, the most bloodied combatants have been in the software arts. In one case, the Examiner first stated that “a control panel to receive” and “a connection module to receive” and a “TCP/IP module to encapsulate” invoked §112(f). The patent

⁴⁶ Based on Examiner interviews and conversations with colleagues.

attorney in that case argued that the control panel was a real element like a resistor or a motor, and was coupled to other sensors providing a structural connection. Also, the element did not include the word “means” and therefore would need to clearly recite function and lack structure to invoke §112(f).

The Examiner seemed to ignore the assertion that the control panel was structure and repeatedly pointed out that the control panel was not adequately described in the disclosure. However, according to Examiner training material in this area of the art (and as the patent attorney argued), the first inquiry should have been whether the claim element described structure, without moving immediately into whether it was adequately described in the disclosure. It was also argued that “control panel” had a reasonably well-understood meaning to those of ordinary in the art, as evidenced by the cited prior art, which described a “control panel” as being a structure. The Examiner responded that the issue was not whether the term was reasonably well-understood in the art, but how the Applicant’s specification used the term.

Further amendments and arguments were made, but the Examiner was not persuaded until the patent attorney amended the claims to include additional physical connections between components.

In a few other cases, practitioners overcame indefiniteness rejections by removing the word “module” from a claim and replacing it with something else, typically involving use of the word “circuitry.” It would appear from this anecdotal evidence that many Examiners do not like the word “module,” and avoiding that term is often sufficient. The author and the author’s colleagues have strongly disfavored the use of the word “module” since *Williamson*. If the word “module” is to be used, the specification should spell out what hardware is contained in that module to support amendments that may be needed to overcome any potential indefiniteness rejections. A better course of action, however, would be to avoid using the term “module” altogether, because it has such potential for being misunderstood by Examiners.

C. Drafting to avoid indefiniteness rejections

In general, applications should present details with respect to how a computer performs each claimed function (for computer-implemented claims). Detailed flowcharts should be provided for every function (and in some cases, even for non-software inventions) in the event case law moves even further afield, where means-plus-function interpretation outside the software arts becomes a common occurrence. As described earlier, practitioners should ask inventors what circuits, computers, processors, etc., are performing each action in the inventive process (with particular attention to the core or “nugget” of the invention), and obtain diagrams, flowcharts, and/or algorithms to support the disclosure wherever possible.

Practitioners should provide, and claim, inputs and outputs for each structure in a claim, and include structure within claims if means-plus-function treatment is not desired. This approach can include descriptions of memory, ports, etc. This style of claiming can provide the added benefit of making it easier to overcome rejections of an “abstract idea” based on *Alice*. Most importantly, practitioners should invoke terms that are commonly understood to be hardware: structural, physical, real-world objects (such as cameras, sensors, processor chips, memory, etc.).

Even with the noted difficulties, practitioners should not necessarily avoid functional claiming. This type of claiming allows practitioners to control the scope of the claim, while providing some degree of equivalents for elements amended for reasons of patentability. Finally, when functional claims form part of a claim set, Examiners may be led away from interpreting the other claims under the means-plus-function statute.

Conclusion

Software patent practitioners should understand that it is the best practice to include structure throughout their specifications, so that amendments can easily be made to overcome a potential indefiniteness rejection. By thinking ahead, and beginning with the disclosure interview, Applicants can kill two birds with one stone: by reciting and describing structure for all claim limitations to avoid indefiniteness issues during patent prosecution.