

Avoiding Pitfalls in Patent Preparation and Prosecution in the Electrical and Computer Arts

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Introduction

Subject matter eligibility and functional claiming issues have bedeviled patent practitioners in the electrical and computer arts in recent years. Adding to the uncertainty, *Alice Corp. v. CLS Bank International*² was decided on June 19, 2014. *Alice* presented the issue of whether claims directed to a computer-implemented service for facilitating financial transactions were ineligible for patent protection because they contained an abstract idea. Within a month of this decision, which determined that such claims were indeed invalid, allowed cases were withdrawn from allowance, and Applicants in certain art classes began receiving massive numbers of 35 USC §101 rejections.

To further the confusion, in *Williamson v. Citrix Online*,³ 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.

This paper provides some insight into USPTO guidance, case law updates in subject matter eligibility and functional claiming, and practice tips that can help avoid common pitfalls arising out of subject matter eligibility and functional claiming. Section I covers subject matter eligibility, and Section II covers functional claiming. The paper concludes with a comparison of functional claiming and patent eligibility requirements, and a note to practitioners that encourages drafting with functional claiming in mind, so as to simultaneously address eligibility issues.

I. Avoiding Pitfalls in Subject Matter Eligibility

A. 2014 Interim Guidance on Patent Subject Matter Eligibility

The *Alice* decision was a dramatic turning point for subject matter eligibility and practitioners looked to the USPTO for guidance and clarity. On December 16, 2014,⁴ the USPTO published Interim Guidance for use by USPTO personnel in determining subject matter eligibility under 35 USC §101. The Interim Guidance was meant to supplement preliminary instructions issued in view of *Alice*.

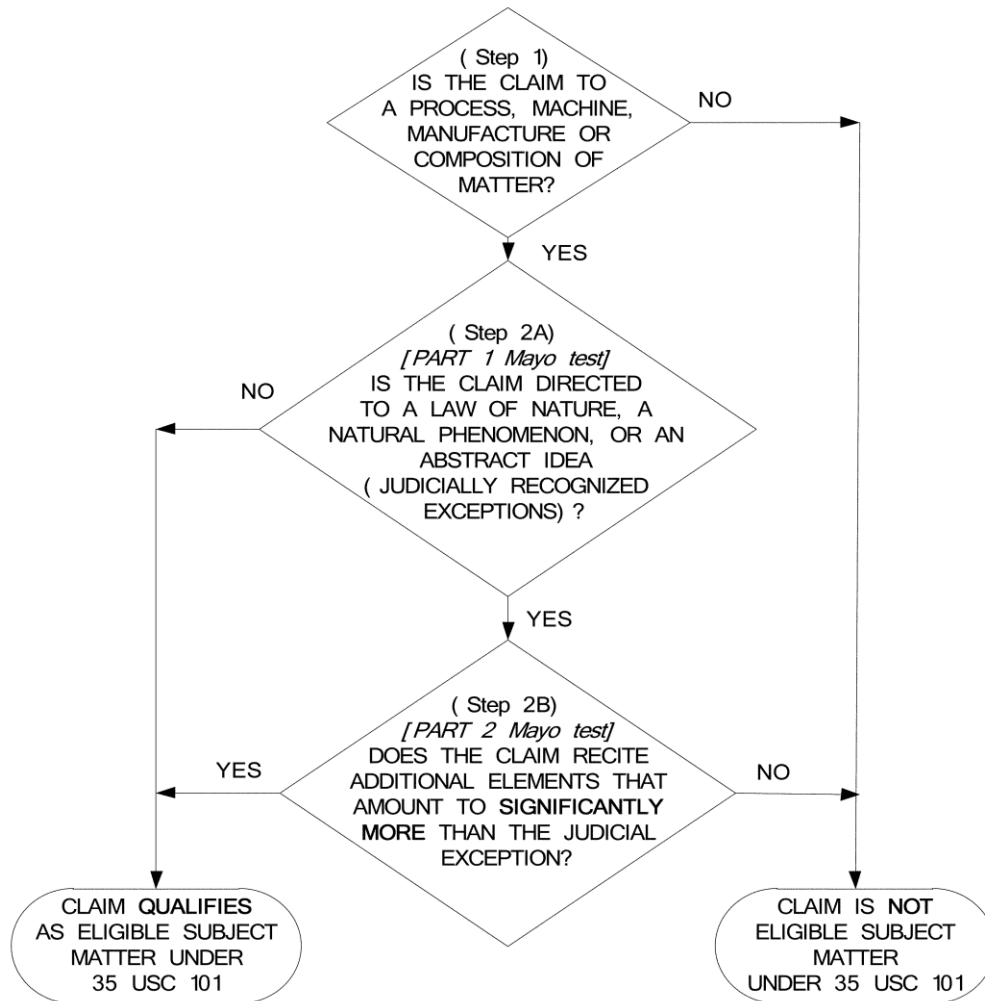
The Interim Guidance provided the following flowchart to illustrate subject matter eligibility analysis to be used during examination to evaluate whether a claim was drawn to patent-eligible subject matter:

¹ Attorney, Schwegman, Lundberg & Woessner, PA.

² *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 134 S. Ct. 2347, 2356 (US 2014).

³ *Williamson v. Citrix Online, LLC*, 115 USPQ2d 1105 (Fed. Cir. 2015).

⁴ <https://www.gpo.gov/fdsys/pkg/FR-2014-12-16/pdf/2014-29414.pdf>



The Interim Guidance provided a list of claim examples of claims that are not subject-matter eligible, being directed to a law of nature or natural phenomenon, or an abstract idea. When a claim falls under one of these judicial exceptions, in order to be patent-eligible, the claim must “include additional features to ensure the claim describes a process or product that applies the exception in a meaningful way, such that it is more than a drafting effort designed to monopolize the exception.” The whole claim is to be considered, because, as the USPTO acknowledged, “individual elements viewed on their own may not appear to add significantly more... but when combined may amount to significantly more than the exception.” What is enough to qualify as “significantly more” has been subject to great debate, but some examples were given in the Interim Guidance. The Interim Guidance also gave examples of what would not be considered “significantly more” for the step 2B analysis.

The USPTO requested public comments on the Interim Guidance, and updates were provided in July 2015.

B. July 2015 Update: Subject Matter Eligibility⁵

An update in July 2015 built on the 2014 Interim Guidance and responded to user comments. The July 2015 Update was intended to provide “pathways to eligibility.” While the Update did not (and legally could not) provide a definition of an “abstract idea,” Examiners were instructed to make findings that a claim was directed to an abstract idea when the concept was “similar to at least one concept that the courts have identified as an abstract idea.” The July 2015 Update provided more information about the types of concepts that were considered by the courts to be abstract ideas. These were described in categories: 1.) fundamental economic practices; 2.) certain methods of organizing human activity; 3.) an idea “of itself,” which includes ideas “standing alone such as an uninstigated concept, plane or scheme, as well as a mental process...that can be performed in the human mind; and 4.) mathematical relationships/formulas.

The July 2015 Update also gave more examples, “particularly for claims directed to abstract ideas and laws of nature” including “claims directed to abstract ideas, particularly in the business method, graphical user interface (GUI), and software areas.” The July 2015 Update stressed the importance of the step 2B analysis as to whether “the claim as a whole amounts to significantly more than an exception.” Several of the examples provided in the July 2015 Update were specifically directed to this “significantly more” analysis.

The July 2015 Update also provided clarification on the role of preemption in the eligibility analysis, including whether and when preemption should be considered in the streamlined analysis. The 2014 Interim Guidance established a streamlined eligibility analysis for certain claims that clearly do not attempt to preempt use of a judicial exception. However, as pointed out in the July 2015 Update, “while a preemptive claim may be ineligible, the absence of complete preemption does not guarantee that a claim is eligible.”⁶

The July 2015 Update also requested public comments. After the 2015 Update, a slight uptick was observed in allowance rates. In at least some art units, allowance rates were back to or near pre-*Alice* levels.⁷

⁵ <http://www.uspto.gov/sites/default/files/documents/ieg-july-2015-update.pdf>

⁶ See *Alice Corp.*, 134 S. Ct. at 2358: Stating an abstract idea “while adding the words ‘apply it’” is not enough for patent eligibility. *Mayo, supra*, at ___, 132 S. Ct. 1289, 182 L. Ed. 2d 321, 325. Nor is limiting the use of an abstract idea “to a particular technological environment.” *Bilski, supra*, at 610-611, 130 S. Ct. 3218, 177 L. Ed. 2d 792. Stating an abstract idea while adding the words “apply it with a computer” simply combines those two steps, with the same deficient result. Thus, if a patent’s recitation of a computer amounts to a mere instruction to “implemen[t]” an abstract idea “on . . . a computer,” *Mayo, supra*, at ___, 132 S. Ct. 1289, 182 L. Ed. 2d 321, 337), that addition cannot impart patent eligibility. This conclusion accords with the pre-emption concern that undergirds our §101 jurisprudence.

⁷ <https://knobbe.com/news/2016/09/impact-uspto-examination-guidelines-software-patents-post-alice> (last visited September 17, 2016)

C. Memorandum-Formulating a Subject Matter Eligibility Rejection and Evaluating the Applicant’s Response to a Subject Matter Eligibility Rejection⁸

In a memorandum dated May 4, 2016, Robert W. Bahr, Deputy Commissioner for Patent Examination Policy provided examination instructions relating to subject matter eligibility. Examiners were instructed to identify any abstract idea (found in step 2A) in their 35 USC §101 rejections, and explain why the so-called abstract idea corresponds to a concept that the courts have identified as an abstract idea. If the Examiner alleges that a claim is directed a law of nature or a natural phenomenon, such law of nature or natural phenomenon must be identified. For the second part of the analysis (step 2B), the rejection should identify the additional elements in the claim and explain why the elements taken individually and in combination do not amount to significantly more than the exception identified in step 2A.

Examiners were also reminded that any examples given in the 2014 Interim Guidance or 2015 Update were only examples and should not be used as a basis for a subject matter eligibility rejection or relied upon in the same manner as a court decision.

D. Memorandum-Recent Subject Matter Eligibility Decisions⁹

On May 19, 2016, Deputy Commissioner Bahr sent a memorandum to the Patent Examining Corps regarding recent subject eligibility decisions (specifically, the *Enfish, LLC v. Microsoft Corp.* and *TLI Communications LLC v. A.V. Automotive, LLC* decisions).

Deputy Commissioner Bahr stated that, in *Enfish*, the Federal Circuit held that claimed database software designed as a “self-referential” table is patent eligible because it is not directed to an abstract idea. According to Deputy Commissioner Bahr, *Enfish* did not change the subject matter eligibility framework, but provided additional information and clarification on how to identify abstract ideas (step 2A from the above flowchart).

As summarized by Deputy Commissioner Bahr, the Federal Circuit noted that “when determining whether a claim is directed to an abstract idea, it is appropriate to compare the claim to claims already found to be directed to an abstract idea in a previous court decision.” As pointed out by Bahr, “the fact that a claim is directed to an improvement in computer-related technology can demonstrate that the claim does not recite a concept similar to previously identified abstract ideas.” Bahr mentioned that the Federal Circuit noted in its *Enfish* decision that “some improvements in computer-related technology, such as chip architecture or an LED display, when appropriately claimed, are undoubtedly not abstract.” Further, “claims directed to software...also are not inherently abstract.”

Bahr told Examiners that they “may determine that a claim directed to improvements in computer-related technology is not directed to an abstract idea under Step 2A of the subject matter eligibility examination guidelines (and is thus patent eligible), without the need to analyze the additional elements under Step 2B.” Thus, the way to determine whether any particular claim is patent eligible is to subjectively determine whether the claim resembles a claim that has been previously determined to be abstract, or whether it is more like a claim that has previously been determined not to be abstract.

Bahr also mentioned the *TLI* decision, which found that the claims at issue were abstract and did not add substantially more, which made the claims patent ineligible. Bahr explained that

⁸ <http://www.uspto.gov/sites/default/files/documents/ieg-may-2016-memo.pdf>

⁹ http://www.uspto.gov/sites/default/files/documents/ieg-may-2016_enfish_memo.pdf

the Federal Circuit found that performing the steps of “using a telephone unit and a server did not add significantly more to the abstract idea because they were well-understood, routine, conventional activities.”

Bahr cautioned Examiners against “describing a claim at a high level of abstraction untethered from the language for the claim when determining the focus of the claimed invention.” Such Examiner characterization of claim language appears to be at the root of many 35 USC §101 rejections, so hopefully Examiners take this guidance to heart. If not, it can be helpful to cite Bahr’s memo in a response to that type of rejection.

E. Case Law Updates

1. *Enfish, LLC v. Microsoft*¹⁰

In *Enfish*, the Federal Circuit reviewed a district court’s summary judgment that database patent claims were invalid under 35 USC §101. The *Enfish* database patents claimed the concept of “self-referential” tables. The main differences between *Enfish*’s self-referential tables and conventional database tables were that self-referential tables could store different entity types in a single table, rather than having a different table for each entity types, and that one or more rows were used to store an index or information defining columns.¹¹ The district court held the claims were directed to “the concept of organizing information using tabular formats,” but the Federal Circuit warned that “describing the claims at such a high level of abstraction and untethered from the language of the claims all but ensures that the exceptions to §101 swallow the rule.”¹² Rather, the appellate court stated “the ‘directed to’ inquiry” is based on whether the claim’s “character as a whole is directed to excluded subject matter.”¹³

According to the court, *Alice* should not be read to imply that “all improvements in computer-related technology are inherently abstract and, therefore, must be considered at step two”¹⁴ (of the *Mayo* analysis¹⁵). Instead, step one “asks whether the focus of the claims is on the specific asserted improvement in computer capabilities” or “a process that qualifies as an ‘abstract idea’ for which computers are invoked merely as a tool.”¹⁶ The court found that the specification provided improvements in computational flexibility and speed, and reductions in memory usage.

The court also did not think the claims were doomed because of “the invention’s ability to run on a general-purpose computer.”¹⁷ The court distinguished the *Alice* claims. According to the court, the claims in *Enfish* “are directed to an improvement in the functioning of a computer.”¹⁸ In contrast, the claims at issue in *Alice* “... can readily be understood as simply adding conventional computer components to well-known business practices.”¹⁹ Furthermore, the patent-ineligible

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

¹¹ Appellee’s Brief at 17.

¹² *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1337 (Fed. Cir. 2016)

¹³ *Id.* at 1335, citing *Internet Patents Corp. v. Active Network Inc.*, 790 F.3d 1343, 1346 (Fed. Cir. 2015).

¹⁴ *Id.*

¹⁵ According to the Supreme Court, the *Mayo* analysis requires that “we first must determine whether the claims at issue are directed to a patent-ineligible concept,” and then determine whether the claim’s elements, considered both individually and as an ordered combination, transform the nature of the claims into a patent-eligible application.

¹⁶ *Enfish, LLC* at 1335

¹⁷ *Id.* at 1337.

¹⁸ *Id.* at 1338.

¹⁹ *Id.*

claims in other cases were directed to use of an abstract mathematical formula on a general purpose computer, rather being “directed to a specific improvement to computer functionality.”²⁰

The court also was not put off by the fact that the claimed improvement was not defined by reference to physical components. The court reasoned that to require definition with reference to physical components would risk “resurrecting a bright-line machine-or-transformation test...or creating a categorical ban on software patents.”²¹ The court recognized that many computer technology advances are improvements in software which “by their very nature, may not be defined by particular physical features but rather by logical structures and processes.”²²

Means-plus-function claiming was also discussed in the *Enfish* decision. A summary of that discussion is provided in Section II of this paper.

2. *Electric Power Group, LLC, v. Alstom*²³

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.”²⁴ 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.”²⁵ 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.”²⁶ 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.”²⁷

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.²⁸ 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.²⁹

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.

²⁰ *Id.*

²¹ *Id.* at 1339.

²² *Id.*

²³ <http://www.cafc.uscourts.gov/sites/default/files/opinions-orders/15-1778.Opinion.7-28-2016.1.PDF>

²⁴ *Elec. Power Group, LLC v. Alstom S.A.*, Case No. 2015-1778 (Fed. Cir. Aug. 1, 2016) at 2.

²⁵ *Id.* at 5.

²⁶ *Id.* at 10.

²⁷ *Id.*

²⁸ *Id.*

²⁹ *Id.* at 11.

3. *Chrimar Systems, Inc., v. Alcatel-Lucent USA*³⁰

In an Eastern District of Texas case, *Chrimar Systems v. Alcatel-Lucent*, Chrimar alleged infringement of a family of patents, including some directed to managing devices that connect to a wired network. Alcatel-Lucent contended that the claims were directed to the abstract idea of correlating information about a device based on a measurable electrical property of the device, and that the claims did not recite an inventive concept beyond the mental task of identifying a measurable circuit property. Chrimar argued that the claims recited concrete devices and structures configured to perform specific functions.

With regard to US Patent No. 8,115,012 (“the ‘012 patent”), the Eastern District of Texas held that the claim in question was not directed to an abstract idea. As the court stated, “simply because the claims require distinguishing information associated to impedance within the path does not mean the claim is abstract or could be performed entirely by a mental act.” Instead, as the court noted, this distinguishing was done over an Ethernet wire path, according to the claim, and in a specific manner.³¹ Moreover, the court cited to *Enfish* and found it important that the invention was directed to solving a specific problem. The court went on to analyze *Mayo* step two even though this was not necessary after deciding the claims were not directed to an abstract idea. Alcatel-Lucent argued that all of the structures were prior art structural elements, and Chrimar argued that even if they were prior art elements, that would not make the claims patent-ineligible. The court agreed with Chrimar (citing *Bascom Global Internet Servs., Inc. v. AT&T Mobility LLC*) and stated that even if components were known in the art, it would be improper to conflate §101 and obviousness inquiries to find the claims lacking in inventive concept. The court then found that the ordered configuration of structures, aimed at the specific performance described, were a transformative inventive concept.

The court made similar findings with respect to other patents in the suit. The contested claims were found to be patent-eligible because they were directed to resolving specific problems and provided means for solving these specific problems. Accordingly, the case holds importance for functional claiming as well as eligibility considerations.

4. *Intellectual Ventures v. J. Crew Group, Inc.*³²

In another Eastern District of Texas case, *Intellectual Ventures v. J. Crew Group, Inc.*, J. Crew alleged that patents asserted by Intellectual Ventures were drawn to patent-ineligible subject matter. Among other points of interest in this case, as with the *Chrimar Systems* case discussed above, the reasoning in this case specifies that claims do not fail *Alice* scrutiny merely because they recite elements known in the prior art.

The first patent at issue, US RE43,715 (“the ‘715 patent”) disclosed a system and method for allowing an internet user to create a web page that simultaneously displayed public and private data as integrated data on one screen. The court found that the ‘715 patent was directed toward the “abstract idea of combining data from two sources for delivery to a user.”³³ Method steps included acquiring data from two sources and combining and integrating the data. Figure 6 of the patent application made it clear that a generic computer network technology was used to achieve

³⁰ *Chrimar Systems, Inc., v. Alcatel-Lucent USA* Civil no. 6:15-cv-163-JDL, decided July 29, 2016 (Eastern District of Texas).

³¹ *Id.* at 7.

³² *Intellectual Ventures v. J. Crew Group, Inc.*, Civil no. 6:16-cv-196-JRG, decided August 24, 2016.

³³ *Id.* at 7.

a well-established real-world practice. The court found that the claims were indeed directed to an abstract idea and moved to step 2 of the *Mayo* analysis. The only inventive concepts were the distinction between private and public data, which the court deemed to be subjective, and further that no teaching was given in the patent application to assess whether the data was private or public.

Thus, it would seem that providing specific algorithms for distinguishing between public and private data might have saved the `715 patent from being found patent eligible. This concept would similarly aid in any potential functional claiming indefiniteness issues, though this was not mentioned by the court.

Regarding the second patent at issue, US 6,782,370, the claims were directed to the acts of receiving a customer request, storing information pertaining to purchase history from previous customers, comparing the customer request to the stored purchase history to determine when there is a match, and displaying the match to the customer (if a match exists). The court thought that all of these same steps could be and often are performed by a “typical sales clerk.” Intellectual Ventures argued that the `370 patent was “an improved ecommerce recommendation system” and therefore was an improvement to computer functionality and patentable according to *Enfish*. The court disagreed and said that “refining the prior art by substituting one abstract idea for another does not result in a patent-eligible improvement.”³⁴

Regarding the third patent at issue, US 5,969,324, (“the `324 patent”), J. Crew argued that the acts recited in the claims do not describe technical terms or special-purpose equipment, and therefore lack an inventive concept. Intellectual Ventures countered that a concrete database system was recited, and further the `324 patent constituted an improvement over the shortcomings of older accounting software. The court found the claims patent-eligible and reasoned that J. Crew was taking an “overly generalized view of the claim language that vitiates meaningful limitations.”³⁵ J. Crew also argued that at least one of the limitations was known in the prior art, but the court said that this did not doom claims under *Alice* scrutiny.

The court found that the invention was a novel combination of nonpredictable bar codes with transaction information resulting in an “improvement over previous software” that relied on manual data entry of transaction information. In the next sentence, the court stated that the unpredictable bar codes amounted to a “significant improvement.” The court here did not define what constituted a “significant improvement” and furthermore it is not clear whether an “improvement” or a “significant improvement” would be sufficient for patent eligibility purposes. (The court also cited to *Enfish* here, which used the term “improvement” rather than “significant improvement” in finding patentability of certain claims.) “Considering all of the above,” the court found the `324 patent to be valid.

³⁴ *Id.* at 10.

³⁵ *Intellectual Ventures v. J. Crew Group, Inc.*, Civil no. 6:16-cv-196-JRG at 11.

5. *McRO, Inc. v. Bandai Namco Games Am. Inc.*³⁶

The patents in this case are related to automating a portion of a preexisting three-dimensional animation method, specifically “determining when to set keyframes and setting those keyframes.” The automation was accomplished through rules to determine various weights.³⁷ The patents in suit criticized the prior art as being “tedious and time consuming, as well as inaccurate.”³⁸ According to the Federal Circuit, the district court analysis “loosely tracks” the two-step framework laid out in *Alice*. First, the district court discussed the claims generally and stated that “facially, these claims do not seem directed to an abstract idea. They are tangible, each covering an approach to automated three-dimensional computer animation, which is a specific technological process.”³⁹ The district court also seemed to apply preemption analysis by stating that, because “at first blush” the claims would not “tie up too much future use of any abstract idea they apply.”⁴⁰ However, in the end, the district court found that the claims were not limited to any particular rules, and therefore the claims were too broadly preemptive.

The Federal Circuit focused on the preemption issue in performing its abstract idea analysis (step I analysis). The Federal Circuit disagreed that the claims here were drawn to an abstract idea of “automated rules-based use of morph targets and delta sets for lip-synchronized three-dimensional animation.”⁴¹ It was reiterated that courts “must be careful to avoid oversimplifying the claims” by looking at them generally and failing to account for the specific requirements of the claims.⁴² Using this reasoning, the court thought that the claims were not directed to an abstract idea because the claims were limited to rules with specific characteristics (and accordingly the claims were not improperly attempting to cover all rules). The claims themselves also spelled out requirements for the rules, and how the rules should be applied. According to the Federal Circuit, the “specific, claimed features of these rules allow for the improvement realized by the invention.”⁴³

The defendant argued that claims simply used a computer to automate a conventional activity, but the court disagreed. The court stated that while the rules were embodied in computer software processed by general-purpose computers, the defendants did not provide evidence that human beings previously used the same process that was claimed.⁴⁴ Instead, human operators used subjective judgment, rather than the claimed rules claimed in the invention. To the court, it was important that “it is the incorporation of the claimed rules, not the use of the computer, that “improved [the] existing technological process” by allowing the automation of further tasks.”⁴⁵ The court distinguished from other cases where claims were found ineligible, in that the ineligible computer-automated process and the prior method were carried out in the same way.⁴⁶

³⁶ *Intellectual Ventures v. J. Crew Group, Inc.*, Civil no. 6:16-cv-196-JRG, decided August 24, 2016.

³⁷ *McRO, Inc. v. Bandai Namco Games Am. Inc.*, 2016 US App. LEXIS 16703, 4-5, and 9 (Fed. Cir. Sept. 13, 2016)

³⁸ *Id.* at 8.

³⁹ *Id.* at 14.

⁴⁰ *Id.* at 14-15.

⁴¹ *Id.* at 24.

⁴² *Id.* at 25.

⁴³ *Id.* at 26.

⁴⁴ *Id.* at 29.

⁴⁵ *Id.*

⁴⁶ *Id.* at 30.

The court never reached *Mayo* step 2 as part of its analysis, because the claims were deemed to be eligible subject matter.

The takeaway from this case is that, when claiming rules, the process should use a combined order of specific rules to create a desired result. The specific structure and order of the rules will then not preempt other uses of the same rules. The court also stated that while the result provided by the rules may not be tangible, “there is nothing that requires a method to be tied to a machine or transform an article” and that “the concern underlying the exceptions to §101 is not tangibility, but preemption.”⁴⁷

F. Successes and Failures after *Alice*

Since the *Alice* decision, there has been a steep decrease in allowance rates in some USPTO art units. Some of these cases were appealed, and recently the Patent and Trademark Appeals Board (PTAB) begun to issue decisions on some of these appeals. However, very few appeals have actually involved eligibility. Between the time of the *Alice* decision and July 12, 2016, 162 PTAB decisions were made on appeals, but only 19 of these involved patent eligibility; patent eligibility rejections were affirmed in 15 of these cases.⁴⁸

About two years after the *Alice* decision, a summary of Federal Circuit 35 USC §101 software eligibility decisions was provided.⁴⁹ Twenty-eight cases were summarized. Patents were found ineligible under 35 USC §101 in twenty-four of those cases.

G. Practice Tips

Practice tips, gleaned from the above case law summaries, from USPTO guidance, and through conversation with the author’s colleagues, have been broken into steps that can be taken while preparing patent applications prior to filing. These follow below, along with some suggestions for dealing with claim eligibility rejections.

1. Drafting Cases with Patent Eligibility in Mind

After reviewing the above-summarized cases, the author found several recurring themes. First, it seems advantageous to add structure to claims, and draft with functional claiming in mind even if the drafter does not intend to include means-plus-function claims. This could overcome 35 USC §101 rejections as well as providing §112(b) support in the event claims are interpreted to fall under §112(f). Some of the more recent cases described lack of specifically-programmed computers and algorithms as part of the reasoning for the 35 USC §101 rejections. Accordingly, the author especially recommends adding structure to claims for software-related inventions, and providing specific algorithms wherever possible. Given the application of 35 USC §101 to electrical inventions, it may be wise to provide algorithms for functions performed by circuits and subsystems as well.

⁴⁷ *Id.*

⁴⁸ <http://www.ipwatchdog.com/2016/08/02/ex-parte-appeals-post-alice/id=71562/>

⁴⁹ <http://www.patents4software.com/2016/08/the-alice-v-cls-bank-scorecard-two-years-later/> (authored by patent attorney Steve Lundberg, last visited September 17, 2016)

Second, practitioners should spell out, where possible, how individual actions are accomplished, using flowcharts, algorithms, and pseudocode wherever possible. Practitioners should make it a practice during invention disclosure interviews to ask 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. This will help in the arena of patent eligibility as well as functional claiming (described below).

Third, practitioners should state the technical problem being solved, to overcome any possible assertions that the claims are directed to an abstract idea. Point out specific improvements in computer capabilities, and point out a correspondence between solution in the claim and the problem faced by technology. It is also helpful to mention this correspondence during Examiner interviews.

2. After the Fact-Arguing before the PTO

The author recently undertook a study of various 35 USC §101 rejections before the USPTO and Applicant arguments that successfully overcame these rejections. It is unknown whether some of the successful arguments would work with every Examiner. However, it should be useful to review common elements found in the winning arguments.

Often, Examiners will make conclusory statements and Applicants should note this fact to Examiners before delving into any other arguments. However, this course should be balanced with the knowledge that most Examiners are not attorneys and are working on a limited time budget; lengthy boilerplate arguments can be counterproductive. The Examiner may be thrown off by long arguments citing case law, or even ignore them, when it might be more productive to simply lead with the particularly strong logical arguments.

Applicants should determine exactly what the Examiner alleges is the abstract idea. If the alleged abstract idea merely relates to the technical problem being solved, and not to the claims or the invention itself, this should be pointed out to the Examiner.

Most successful Applicants stepped through the two-part *Mayo* test in their responses. The first part of this test relates to whether the claims at issue are directed to an abstract idea by requiring the Examiner to determine “whether the claims at issue are directed to a patent-ineligible concept.” The Court’s approach in *Alice* of applying *Mayo* Step I shows that determining whether claims at issue are directed to abstract ideas involves a determination of whether the claims are directed to (1) an idea of itself (e.g., an algorithm for converting binary coded decimal numerals into pure binary form, as in *Benson*, or a mathematical formula for computing “alarm limits” in a catalytic conversion process, as in *Flook*) or (2) a fundamental economic practice (e.g., risk hedging, as in *Bilski*, or intermediated settlement, as in *Alice*). In fact, these two types of claims are the only types of claims that the Court has positively identified as being within the abstract ideas category of the Court’s implicit exception to subject matter eligibility. Additionally, Applicants should refer to the May 19, 2016 Memorandum discussed above, particularly when improvements in computer-related technology are involved, to argue that a claim is not directed to an abstract idea.

Even assuming that the claims are directed to an abstract idea, Step II of the *Mayo* test must still be applied (however, if Step I does not apply, Applicants should argue that no Step II analysis should be done). In that step, the elements of the claim are examined to determine whether it

contains an “inventive concept” sufficient to “transform” the claimed abstract idea into a patent-eligible application. Several factors should be considered. Some of the successful arguments cited non-preemption, the idea that the claims provided “significantly more” beyond the alleged abstract idea, and the idea that the invention provided concrete improvements in a technological area.

However, Examiners have informally admitted that it is difficult for them to see how a combination of known items acting in known ways can unexpectedly operate in a new way that is distinct from the abstract idea found in Step I of the *Mayo* test. Accordingly, if the analysis does get this far, practitioners should expect an appeal, or at the very least, to have to bring their arguments before a more senior Examiner to remove the rejection.

Keep in mind that Examiners may be more amenable to your point of view when an amendment is made. This is not to say that practitioners should not present arguments without amendment, particularly when the arguments are strong. However, sometimes non-limiting amendments can be made that appease the Examiner, and gain allowance.

In various Examiner interviews over the last two years, while observing the success and failure of various amendments, the author and the author’s colleagues received some Examiner guidance on limitations that stand a better chance of being found eligible. In method claims, for instance, it can be helpful to provide some physical operation as a last step of the method. For example, connection to a network can be added as a final step for a network authentication method. Generic and abstract limitations will not be helpful in overcoming rejections. For example, one Examiner gave this list of unhelpful limitations:

- receiving, storing, transmitting, or displaying data that is recited as already being in existence (too generic)
- manipulating or altering data from one state to another (too abstract)
- configuring a device (too generic)

The same Examiner suggested removing any “business method” terms, reciting how a machine responds to technical triggers or conditions, and reciting data generation (as opposed to merely displaying data).

II. Avoiding Pitfalls in Functional Claiming

A. History of Functional Claiming

The history of functional claiming begins with a story near and dear to the author’s heart, as a ham radio operator⁵⁰: the story of Samuel Morse. It begins in 1832, when Mr. Morse came up with uses of electromagnetic theory in the development of the telegraph. When he returned to the United States, he drew up figures for an instrument that we now recognize as a telegraph. He began reduction to practice and in 1837 filed a patent application that resulted in granting of several patents.

Infringement litigation ensued, which eventually reached the Supreme Court. Claim 8 in one of the patents, shown here, was explicitly denied because it claimed all uses of electromagnetism:

“Eighth. I do not propose to limit myself to the specific machinery or parts of machinery described in the foregoing specification and claims; the essence of my invention being the use of the motive power of the electric or galvanic current, which I call electro-magnetism, however developed for marking or printing

⁵⁰ Call sign NS9C

intelligible characters, signs, or letters, at any distances, being a new application of that power of which I claim to be the first inventor or discoverer.”

However, the Supreme Court sustained Morse’s right to a patent for a repeater apparatus means for transmitting via telegraph. Morse’s case is significant with regards to the history of functional claiming because it indicates the Supreme Court’s general wariness toward functional claiming, the practice of describing an invention according to what it does rather than what it is. As described in an article by David Kappos, former Director of the USPTO, functional claiming risks granting patent rights to every means of solving a problem.⁵¹

One hundred years later, the story moves from telegraph wires in the sky to oil wells in the bowels of the earth via *Halliburton* which introduced means-plus-function claiming into mainstream practice.

In *Halliburton v. Walker*, the Supreme Court construed claims directed to an improvement in an apparatus for measuring the distance from the top of a well to the top of the fluid in the well. The specification showed physical structure for an acoustic apparatus designed to inject pressure impulses into the well and receive, note, and record the time of return of those impulses.

The district court and appellate court held the patents valid because they were an improvement that used acoustical means for receiving and filtering wave impulses. However, the Supreme Court held the patent invalid and said that Walker did not describe the invention properly, but used functional language describing what the apparatus will do rather than the physical characteristics or arrangement of elements in the new apparatus. A few years later, when Congress revised the patent law, 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.

⁵¹ Kappos, David J. and Davis, Christopher P., *Functional Claiming and the Patent Balance*, 18 Stan. Tech. L. Rev. 365 (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.”⁵²

B. Functional Claiming at the USPTO

So how do Examiners determine when 35 USC §112(f) should be applied?

The answer is that Examiners were trained on §112(f) after the 2013 Software Partnership Roundtables.⁵³ It is important for Examiners to recognize which claim limitations invoke §112(f) because this governs the broadest reasonable interpretation for those limitations, and accordingly controls the breadth of the prior art that can be properly applied.

The training was divided into four modules. The first module taught Examiners how to identify §112(f) limitations. According to the Manual of Patent Examination Procedure (MPEP) §2181, a claim limitation should be interpreted according to §112(f) if: 1.) it uses the term “means” or a generic placeholder for the term means; 2.) if “means” or the generic placeholder is modified by functional language linked by a transition word; AND 3.) if the term “means” or its placeholder is not modified by sufficient structure to perform the claimed function. If all these criteria are not met, the limitation should not be interpreted under §112(f).

The second module concerned clarity of the record, which is outside the scope of the 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

⁵² *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312-1313 (Fed. Cir. 2005).

⁵³ 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>

an algorithm⁵⁴ 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.”⁵⁵ 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, the structures and the level of description needed will vary depending on whether functions can be performed by a 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.

C. *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

⁵⁴ An algorithm is a step-by-step procedure for accomplishing a given result.

⁵⁵ *Finisar*

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.”⁵⁶

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.⁵⁷

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.”⁵⁸ 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.⁵⁹ Practitioners must link any structure in the specification to the claimed function, and any structure must be “adequate” to achieve the claimed function.⁶⁰ 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.⁶¹

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.

D. 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.

⁵⁶ *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1348 (Fed. Cir. 2015)

⁵⁷ *Id.* at 1351.

⁵⁸ *Id.*, at 1351.

⁵⁹ *Id.*

⁶⁰ *Id.* at 1352.

⁶¹ *Id.*

1. *Media Rights Technologies, Inc. v. Capital One Financial Corp.*⁶²

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).⁶³ *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.

2. *Collaborative Agreements, LLC v. Adobe Sys.*⁶⁴

In *Collaborative Agreements*, Adobe filed a motion requesting that the claims be construed in light of the *en banc* decision in *Williamson*.⁶⁵ Adobe requested reconsideration of the terms “code segment” and “computer readable medium encoded with a computer program.”⁶⁶ 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 terminology (e.g., “code segment”) in a claim should result in a means-plus-function limitation.⁶⁷ 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.⁶⁸ Furthermore, the court thought the language

⁶² *Media Rights Technologies, Inc. v. Capital One Financial Corp.*, 800 F.3d 1366 (Fed. Cir. September 4, 2015)

⁶³ *Id.* at 1375.

⁶⁴ *Collaborative Agreements, LLC v. Adobe Sys.*, 2015 US Dist. LEXIS 161809 (N.D. Cal. Dec. 2, 2015)

⁶⁵ *Id.* at 3.

⁶⁶ *Id.* at 4.

⁶⁷ *Id.* at 13.

⁶⁸ *Id.* at 13-14.

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....⁶⁹

In the end, claim 25 was likened to a claim reciting a circuit in the *Linear Tech*⁷⁰ 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.

3. *SyncPoint Imaging, LLC v. Nintendo of Am. Inc.*⁷¹

SyncPoint was a dispute in which use of the term “processor” was held to not invoke a means-plus function interpretation.⁷² In reaching this conclusion, the court discussed *Personal Audio*,⁷³ which read *Aristocrat*⁷⁴ 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.*⁷⁵ 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 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,

⁶⁹ *Id.* at 12-13.

⁷⁰ *Linear Tech. Corp. v. Impala Linear Corp.*, 379 F.3d 1311 (Fed. Cir. 2004).

⁷¹ *SyncPoint Imaging, LLC v. Nintendo of Am. Inc.*, 2016 US Dist. LEXIS 677 (E.D. Tex. Jan. 5, 2016)

⁷² *Id.* at 55.

⁷³ *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).

⁷⁴ *Aristocrat Techs. Australia Pty Ltd. v. Int'l Game Tech.*, 521 F.3d 1328 (Fed. Cir. 2008).

⁷⁵ *Apple Inc. v. Motorola, Inc.*, 757 F.3d 1286, 1298 (Fed. Cir. 2014).

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.⁷⁶

The court also cited *Smartflash*⁷⁷ 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.

4. *Enfish, LLC v. Microsoft*⁷⁸

Patent eligibility issues regarding *Enfish* were discussed in Section I. *Enfish* also has implications for means-plus-function claiming. In *Enfish*, Microsoft requested that some claims be found indefinite on grounds of indefiniteness.⁷⁹ 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."⁸⁰ As noted by the court, for a functional claim element “the specification must contain sufficient descriptive text by which a person of skill in the field of the invention would ‘know and understand what structure corresponds to the means limitation.’”⁸¹

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’”.⁸²

5. *Electric Power Group, LLC, v. Alstom*⁸³

Patent eligibility issues regarding *Electric Power Group* were discussed in Section I. *Electric Power Group* provides some direction for means-plus-function claiming. 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.”⁸⁴ 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.

⁷⁶ *Id.*

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

⁷⁸ <http://www.cafc.uscourts.gov/sites/default/files/opinions-orders/15-1244.Opinion.5-10-2016.1.PDF>

⁷⁹ *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1339.

⁸⁰ *Id.*

⁸¹ *Id.*

⁸² *Id.*

⁸³ <http://www.cafc.uscourts.gov/sites/default/files/opinions-orders/15-1778.Opinion.7-28-2016.1.PDF>

⁸⁴ *Elec. Power Group, LLC v. Alstom S.A.*, 2016 US App. LEXIS 13861, 13-15 (Fed. Cir. Aug. 1, 2016)

6. *Advanced Ground Info. Sys. V. Life360, Inc.*⁸⁵

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, ¶ 6.⁸⁶ 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.⁸⁷ 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.

E. Practice Tips for Functional Claiming after *Williamson*

1. 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

⁸⁵ *Advanced Ground Info. Sys. v. Life360, Inc.*, 2016 US App. LEXIS 13707, 7-8 (Fed. Cir. July 28, 2016).

⁸⁶ *Advanced Ground Info.* at 7.

⁸⁷ *Id.* at 10.

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,⁸⁸ 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

⁸⁸ Based on Examiner interviews and conversations with colleagues.

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.

2. 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 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.

3. 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

In several of the above summarized cases, the courts either explicitly or implicitly equate patent eligibility analysis (in particular, step I analysis for abstractness) with the indefiniteness determinations. Software patent practitioners should therefore understand that it is the best practice to include structure throughout their specifications, so that amendments can easily be made to overcome a potential 35 USC §101 rejection, or an 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 both patent eligibility and indefiniteness issues during patent prosecution.