Computer-implemented Functional Claim Limitations
– How Much Corresponding Structure Needs to be Disclosed?

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The Federal Circuit has struggled to clarify to what degree of detail such an algorithm, as corresponding structure to the subject means-plus-function limitation, needs to be disclosed in the specification and whether the knowledge possessed by a skilled artisan has any effect on the amount of disclosure concerning the degree of detail to which the algorithm is disclosed.

As discussed below, the Federal Circuit has been increasingly using the indefiniteness rationale to invalidate patent claims including computer-implemented means-plus-function limitations. It appears that the Federal Circuit sets a higher bar for the definiteness of a claim under § 112, second paragraph when a claim invokes interpretation under § 112, sixth paragraph.

This may be because an applicant is allowed to claim an invention in functional terms only in exchange for disclosing structures which clearly perform the claimed function. Otherwise, the claim would be purely functional and the patentee would be theoretically entitled to coverage of any structure that carried out the function at issue – the courts view this, and it appears rightly so, as impermissible under § 112, sixth paragraph as it is contrary to its intent.

Or perhaps the Federal Circuit’s higher threshold regarding the degree of detail an algorithm (corresponding to the subject means-plus-function limitation) needs to be disclosed in the specification by a patent applicant is an attempt to preclude computer algorithms under the guise of indefiniteness. As evidenced by the recent en banc decision by the Federal Circuit in CLS Bank v. Alice Corporation, No. 2011-1301 (Fed. Cir. 2013), all ten judges recognized that the test for patent eligibility under section 101 should be “a consistent, cohesive, and accessible approach” that provides guidance and predictability for patent applicants and examiners, litigants, and the courts. However, the judges could not agree as to what this consistent, cohesive, and accessible approach should be – instead, the ten-member en banc panel released seven different decisions.

The increasing use of the indefiniteness rationale to invalidate patent claims including computer-implemented means-plus-function limitations is discussed below through the review of some of the Federal Circuit’s notable decisions in the time period of 1997-2012.

The Federal Circuit consistently interprets means-plus-function limitations by referring to the Specification for corresponding structure. In addition, in its landmark In re Donaldson decision in 1994 regarding the U.S. Patent and Trademark Office (USPTO)’s examining procedures, the Federal Circuit imposed a requirement on the USPTO to construe means-plus-function limitation claims in this manner.

The Federal Circuit reaffirmed Donaldson in 1997 stating that “[f]ailure to describe adequately the necessary structure, material, or acts in the written description means that the drafter has failed to comply with the mandate of § 112 P 2…the mandate that all claims must particularly point out and distinctly claim the subject matter which the applicant regards as his invention (In re Dossel, 115 F.3d 942, 946 (Fed. Cir. 1997)). However, the Federal Circuit also suggested in Dossel that a skilled artisan’s knowledge of relevant known algorithms corresponding to the functional limitation at issue may negate the requirement of § 112, sixth paragraph for disclosing the requisite algorithm serving as the corresponding structure.

Only two years later in 1999, the Federal Circuit interpreted § 112, sixth paragraph as requiring that an algorithm be disclosed in the specification in a means-plus-function claim in which the disclosed structure is a computer, or microprocessor, programmed to carry out the algorithm, as “the disclosed structure is not the general purpose computer, but rather the special purpose computer programmed to perform the disclosed algorithm” (WMS Gaming Inc. v. International Game Tech., 184 F.3d 1339, 1349 (Fed. Cir. 1999) (emphasis added)).
In that same year, however, the Federal Circuit held that the determination of “whether sufficient structure was disclosed in the specification [should be] based on the understanding of one skilled in the art” (Atmel Corp. v. Information Storage Devices, 198 F.3d 1374, 1378 (Fed. Cir. 1999)). The Federal Circuit supported its position on the grounds that “[a]s a general matter, it is well-established that the determination whether a claim is invalid as indefinite ‘depends on whether those skilled in the art would understand the scope of the claim when the claim is read in light of the specification’”.

A few years later, the Federal Circuit broadened the role of a skilled artisan’s understanding of the corresponding structure in light of the Specification (Intel Corp. v. VIA Techs., 319 F.3d 1357, 1365 (Fed. Cir. 2003)). Here, the structure corresponding to the means-plus-function limitations was held to be the core logic of a computer adapted to perform a specified program along with the protocol used to perform the program, and the Federal Circuit held that the “patent is not indefinite merely because no specific circuitry is disclosed to show the modification”.

That same year, the Federal Circuit appeared to clarify and further refine its holding in Atmel Corp. and Intel Corp. by emphasizing that the patent specification and/or prosecution history should provide a clear link to the structure corresponding to the claimed function and statements from experts cannot be used to “rewrite the patient’s specification” to create a clear link where the language in the specification provides none (Med. Instrumentation & Diagnostics Corp. v. Elekta AB, 344 F.3d 1205 (Fed. Cir. 2003)).

A few years later, in 2005, the Federal Circuit further solidified its interpretation of claims invoking § 112, sixth paragraph by strongly affirming its holding that the structure of computer-implemented means-plus-function limitations is restricted to the algorithm disclosed in the specification (Harris Corp. v. Ericsson Inc., 417 F.3d 1241, 1254 (Fed. Cir. 2005)).

Then, in 2007, the Federal Circuit appeared to contradict its holdings in Atmel Corp. (1999) and Intel Corp. (2003) when it refused to give any consideration to structures that would have been known to a skilled artisan with respect to the means-plus-function claim limitation at issue (Biomedino, LLC v. Waters Techs. Corp., 490 F.3d 946, 949 (Fed. Cir. 2007)).

Confusingly, however, in that same year the Federal Circuit seemed to again favor relying on the knowledge of a person of ordinary skill in the art when determining the definiteness of a means-plus-function claim limitation (AllVoice Computing PLC v. Nuance Commun., Inc., 504 F.3d 1236, 1241-1242 (Fed. Cir. 2007)).

The most recent cases from the Federal Circuit related to the interpretation of computer-implemented functional language in mean-plus-function claims further highlight the confusing state of the law regarding claim definiteness under § 112, second paragraph vis-à-vis computer-implemented means-plus-function limitations as interpreted under § 112, sixth paragraph. These most recent cases could be characterized in at least the following three categories:

I. Aristocrat line of cases which held that “the structure disclosed in the specification [needs to] be more than simply a general purpose computer or microprocessor” – corresponding structure usually equated to an algorithm that can be expressed as mathematical formula, in prose, as a flow chart, etc. (Aristocrat Techs. Austl. Pty Ltd. v. Int’l Game Tech., 521 F.3d 1328, 1333 (Fed. Cir. 2008));

II. In re Katz, which defined an exception to the Aristocrat rule. In In re Katz, it was held that an algorithm need not be disclosed when the function can be achieved by any general purpose computer without special programming. (e.g., functions include processing, receiving, and storing) (In re Katz Interactive Cal Processing Patent Litigation, 639 F.3d 1303, 1316 (Fed. Cir. 2011)); and

III. ePlus v. Lawson and Function Media v. Google, which support the Federal Circuit’s holding in Med. Instrumentation that a skilled artisan’s knowledge cannot be used to establish a link between the computer-implemented means-plus-function limitation and the corresponding structure. Rather, the link between the computer-implemented means-plus-function limitation and the corresponding structure must be clearly understood by reviewing the specification and/or the prosecution history (ePlus, Inc. v. Lawson Software, Inc., 700 F.3d 509 (Fed. Cir. 2012), and Function Media, L.L.C. v. Google Inc., 708 F.3d 1310 (Fed. Cir. 2013)).

As to the first category, Aristocrat dealt with a case in which the means-plus-function limitation at issue – game control means – was linked to a portion of the specification disclosing that the special-purpose computer with an algorithm to perform the function at issue could be achieved by “appropriate programming”. In view of the generality of this disclosure, the Federal Circuit interpreted the specification as disclosing “no algorithm at all” and thus there was no reason to investigate whether an algorithm was disclosed with sufficient specificity. In other words, the holding in Aristocrat seemed to suggest that the Federal Circuit was adopting the rule set forth in WMS Gaming case of 1999 that § 112, sixth paragraph, in the context of computer-implemented means-plus-function limitations, requires that an algorithm be disclosed in the specification as “the disclosed structure is not the general purpose computer, but rather the special purpose computer programmed to perform the disclosed algorithm”.

However, the In re Katz decision confused the requirement of disclosing the specific algorithm by allowing no disclosure of an algorithm when the function can be achieved by any general purpose computer without special programming. Specifically, in this case, the Federal Circuit criticized the lower court for interpreting the principles of WMS Gaming, Harris, and Aristocrat too broadly – the Federal Circuit stated that “[t]hose cases involved specific functions that would need to be implemented by programming a general purpose computer to convert it into a special purpose computer capable of performing those specified functions...By contrast, [in the claims at issue], Katz has not claimed a specific function performed by a special purpose computer, but has simply recited the claimed functions of “processing,” “receiving,” and “storing.”” – the Federal Circuit held that it was not necessary to disclose more structure than the general purpose processor that performs those functions...because the functions of “processing,” “receiving,” and “storing” are coextensive with the structure disclosed, i.e., a general purpose processor.

However, the Federal Circuit seems to be attempting to narrow the exception defined in In re Katz, perhaps realizing the confusion brought about by allowing patentees to get away with disclosing no structure corresponding to computer-implemented means-plus-function limitations that can
be shown to be performed by any general purpose computer.

For instance, in Ergo Licensing, LLC and Uvo Holscher v. Carefusion\(^6\), the Federal Circuit categorized the In re Katz ruling as a “narrow exception” and stated that the means plus function limitation at issue here does not fit into this narrow exception because it cannot be performed by a general-purpose computer without any special programming (e.g., the function of “controlling the adjusting means” requires more than merely plugging in a general purpose computer).

Again, however, there was a suggestion of disagreement among the Federal Circuit panel here – Judge Newman dissented and expressed concern that the majority’s holding risks validity of “thousands of claims to systems in which, in today’s electronic cyber-assisted technologies, digital devices routinely perform some steps of a new system”. Judge Newman believes that deference to USPTO expertise should be given, and close questions of indefiniteness in litigation involving issued patents should be resolved in patentee’s favor. In essence, Judge Newman believed that “programmable control means” at issue fits within the In re Katz exception (requirement of § 112, ¶ 6 is met when claimed functions are “coextensive with the structure disclosed”).

The narrowing of the In re Katz exception for generic functions continued in Noah Systems, Inc. v. Intuit Inc.\(^7\), where the Federal Circuit held that in a claim reciting multiple identifiable functions in a means plus function limitation and the specification discloses an algorithm for only one, or less than all, of those functions, then the subject claim limitation should be analyzed as disclosing no corresponding algorithm whatsoever. In this case too, Federal Circuit distinguished the subject claim limitation from the In re Katz exception – stating that the access means claim limitation at issue is “a special purpose computer-implemented means-plus-function limitation”.

Coming to the last category, the recently decided cases – ePlus and Function Media – on the definiteness of claims under § 112, second paragraph when the claim limitation invokes § 112, sixth paragraph has further confused this issue – here, the Federal Circuit appears to be promoting its previously advanced view in Med. Instrumentation that a skilled artisan’s knowledge cannot be used to establish a link between the computer-implemented means-plus-function limitation and the corresponding structure.

For instance, the Federal Circuit held in ePlus that “[t]he indefiniteness inquiry is concerned with whether the bounds of the invention are sufficiently demarcated, not with whether one of ordinary skill in the art may find a way to practice the invention [citing Aristocrat]…To assess whether a claim is indefinite, therefore, we do not “look to the knowledge of one skilled in the art apart from and unconnected to the disclosure of the patent.”…We rather “look at the disclosure of the patent and determine if one of skill in the art would have understood that disclosure to encompass [the required structure].” (quoting Med. Instrumentation)”.\(^8\)

Similarly, in Function Media, the Federal Circuit emphasized that having failed to provide any disclosure of the structure for the subject “transmitting” function, Function Media cannot rely on the knowledge of one skilled in the art to fill in the gaps – in other words, even “the testimony of one of ordinary skill in the art cannot supplant the total absence of structure from the specification” (quoting Noah Systems, Inc.).

**CONCLUSION**

Therefore, it seems the Federal Circuit is still struggling with setting forth clear guidance for determining claim definiteness under § 112, second paragraph when a claim limitation at issue in a computer-implemented invention invokes interpretation under § 112, sixth paragraph. In other words, the Federal Circuit still has not been able to set forth a clear standard of how much corresponding structure an Applicant must disclose when claiming a computer-based invention in means-plus-function format and almost as importantly, how much does the knowledge of a skilled artisan come into play when determining whether the corresponding structure has been disclosed in sufficient specificity.

It is well-settled that claim validity with respect to definiteness under 35 U.S.C. § 112, second paragraph depends on whether those skilled in the art would understand the scope of the claim when the claim is read in light of the specification. However, the Federal Circuit’s statement in Atmel that a natural consequence of this principle is that the same standard should be used to determine whether sufficient structure has in fact been disclosed to support a means-
plus-function limitation under 35 U.S.C. § 112, sixth paragraph is debatable.

For instance, since the second clause of 35 U.S.C. § 112, sixth paragraph specifically requires that the means-plus-function limitation at issue be construed to cover the corresponding structure, material, or acts described in the specification, there seems to be a higher standard for sufficiency of disclosure when analyzing definiteness of a means-plus-function limitation as compared to the standard for the sufficiency of disclosure when analyzing a claim only under 35 U.S.C. § 112, second paragraph (i.e., without § 112, sixth paragraph being invoked as the quid pro quo for allowing the patentee to express the claim in terms of function rather than structure).

As such, in the event that the specification and prosecution history are unclear regarding the link between a computer-implemented means-plus-function limitation and the corresponding algorithm(s), the specification must be reviewed from a skilled artisan’s perspective but it must be determined whether the skilled artisan would understand the specification itself to disclose the specific algorithm that can be construed as the corresponding structure, not whether the skilled artisan would simply be enabled to implement the claimed function by any algorithm.

This makes more sense than the views promoted by the Federal Circuit in cases like Atmel, Intel, and In re Katz where considerable weight is given to a skilled artisan’s knowledge when determining what algorithms correspond to a computer-implemented means-plus-function limitation – this is because the second clause of 35 U.S.C. §.112, sixth paragraph reciting that a means-plus-function claim limitation “shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof” seems to set forth a higher threshold for describing the structure than the requirement for definiteness under 35 U.S.C. § 112, second paragraph which dictates that “[t]he specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention”.

ENDNOTES

1. 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.

2. By way of the Leahy-Smith America Invents Act of 2011, each of the six paragraphs of 35 U.S.C. § 112 were labeled as sections (a)-(f), respectively.

3. In re Bond, 910 F.2d 832 (Fed. Cir. 1990)

4. In re Donaldson, 16 F.3d 1189, 1194 (Fed. Cir. 1994)

5. WMS Gaming Inc., 184 F.3d at 1349 (emphasis added)


