

**From:** Zac Hudson

**Sent:** Monday, April 15, 2013 6:57 PM

**To:** SoftwareRoundtable2013

**Subject:** Public Comments Regarding Roundtable Events for Partnership for Enhancement of Quality of Software-Related Patents Submitted On Behalf Of Verizon Communications Inc.

On behalf of Verizon Communications Inc., we respectfully submit the attached comments in response to the PTO's *Request for Comments and Notice of Roundtable Events for Partnership for Enhancement of Quality of Software-Related Patents*, 78 Fed. Reg. 292 (Jan. 3, 2013).

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April 15, 2013

The Honorable Teresa Stanek Rea  
Acting Under Secretary of Commerce for Intellectual Property  
And Acting Director of the USPTO  
U.S. Department of Commerce  
445 12th Street, SW  
Washington, D.C. 20554

Re: *Public Comments Regarding Roundtable Events for Partnership for Enhancement of Quality of Software-Related Patents Submitted On Behalf Of Verizon Communications Inc.*

Dear Acting Under Secretary Rea:

On behalf of Verizon Communications Inc., we respectfully submit these comments in response to the PTO's *Request for Comments and Notice of Roundtable Events for Partnership for Enhancement of Quality of Software-Related Patents*, 78 Fed. Reg. 292 (Jan. 3, 2013). Verizon frequently must defend against baseless allegations of patent infringement. Verizon also conducts extensive research and owns many patents. Accordingly, Verizon has a strong interest in a balanced patent system that protects legitimate property rights while avoiding the harmful effects of practices that threaten innovation.

Functional claiming—the use of claim language that captures an undefined swath of existing or future structures so long as they perform a specified function—is a significant problem. Such claims permit patentees to claim functions, not inventions, and thereby obscure “[t]he limits of a patent [that] must be known for the protection of the patentee, the encouragement of the inventive genius of others, and the assurance that the subject of the patent will be dedicated ultimately to the public.”<sup>1</sup> Patents with these anti-innovation attributes are particularly prevalent in the software industry and threaten America's intellectual property system.

The PTO should take steps to eliminate functional claiming. First, the PTO should make clear that patent claims using functional language that lack sufficient associated structure—either in the claim itself or in the specification—are invalid. Second, the PTO should set a high bar for what constitutes sufficient structure when a patent utilizes functional language. In the computer-implemented invention context, that means that a patent must provide, at a minimum, all the information necessary to perform the recited function.<sup>2</sup>

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<sup>1</sup> *General Electric Co. v. Wabash Appliance Corp.*, 304 U.S. 364, 369 (1938).

<sup>2</sup> While these comments address functional claiming in the software context, Verizon does not believe that there should be a special set of rules for software patents. The ban on functional

## **I. Claims That Employ Functional Language And Lack Sufficient Associated Structure Are Invalid Under 35 U.S.C. § 112 ¶ 2.<sup>3</sup>**

When a patent claim uses functional language, that language must be accompanied by sufficient structure—either in the claim itself<sup>4</sup> or, when § 112 ¶ 6 applies, in the specification<sup>5</sup>—or it is invalid as indefinite under § 112 ¶ 2.<sup>6</sup> Arguments in favor of functional claiming are based on a misunderstanding of the relevant precedent and what § 112 ¶ 6 permits.

The Supreme Court has long recognized the problems presented by functional claiming and thus held claims relying on functional language invalid. In the 1854 “telegraph” case, *O’Reilly v. Morse*, the Court invalidated Samuel Morse’s attempt to patent “the use of the motive power of the electric or galvanic current . . . however developed, for making or printing

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claiming, and the requirement that functional language be accompanied by sufficient structure, should apply to all patents.

<sup>3</sup> Prior to the passage of the Leahy-Smith America Invents Act, § 112(b) was codified as § 112 ¶ 2, and § 112(f) was codified as § 112 ¶ 6. These comments refer to the provisions as they were codified before the AIA in order to be consistent with the language used in the sources cited and discussed.

<sup>4</sup> *TriMed, Inc. v. Stryker Corp.*, 514 F.3d 1256, 1259-60 (Fed. Cir. 2008); *cf. Al-Site Corp. v. VSI Int’l, Inc.*, 174 F.3d 1308, 1317-19 (Fed. Cir. 1999) (Although the claim elements “eyeglass hanger member” and “eyeglass contacting member” include a function, “namely, ‘mounting a pair of glasses,’” § 112 ¶ 6 is not invoked because “the claims themselves contain sufficient structural limitations for performing those functions.”).

<sup>5</sup> *AllVoice Computing PLC v. Nuance Commc’ns, Inc.*, 504 F.3d 1236, 1245 (Fed. Cir. 2007); *see, e.g., In re Aoyama*, 656 F.3d 1293, 1298 (Fed. Cir. 2011) (Claims that “lack[] sufficient disclosure of structure under 35 U.S.C. § 112 ¶ 6 . . . are unpatentable as indefinite under 35 U.S.C. § 112 ¶ 2.”); *Halliburton Energy Servs., Inc. v. M-I LLC*, 514 F.3d 1244, 1249 (Fed. Cir. 2008) (“where a claim recites means-plus-function elements without disclosing corresponding structure in the specification” it is invalid as indefinite); *In re Donaldson Co.*, 16 F.3d 1189, 1195 (Fed. Cir. 1994) (en banc) (“[I]f one employs means-plus-function language in a claim, one must set forth in the specification an adequate disclosure showing what is meant by that language. If an applicant fails to set forth an adequate disclosure, the applicant has in effect failed to particularly point out and distinctly claim the invention as required by the second paragraph of section 112.”); *Supplementary Examination Guidelines for Determining Compliance with 35 U.S.C. 112 and for Treatment of Related Issues In Patent Applications*, 76 Fed. Reg. 7,162, 7,168 (Feb. 9, 2011) (“*Examination Guidelines*”) (A claim is invalid under § 112 ¶ 2, when “§ 112, ¶ 6 is invoked and there is no disclosure or there is insufficient disclosure of structure, material, or acts for performing the claimed function.”).

<sup>6</sup> Relatedly, “claims may fail to satisfy the written description requirement when the invention is claimed and described in functional language but the specification does not sufficiently identify how the invention achieves the claimed function.” *Examination Guidelines*, 76 Fed. Reg. at 7,170; *see Ariad Pharm., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1349 (Fed. Cir. 2010) (“[A]n adequate written description of a claimed genus requires more than a generic statement of an invention’s boundaries.”).

intelligible characters, letters, or signs, at any distances.”<sup>7</sup> The Court explained that “[f]or aught that we now know some future inventor, in the onward march of science, may discover a mode of writing or printing at a distance by means of the electric or galvanic current, without using any part of the process or combination set forth in the plaintiff’s specification.”<sup>8</sup> That mode, however, even if “less complicated” and “less expensive in construction[] and in its operation” would still be covered by Morse’s patent, depriving both the inventor and the public of the benefit of the technology.<sup>9</sup>

By 1928, as the Supreme Court recognized in *Holland Furniture Co. v. Perkins Glue Co.*, it was “well understood” that a “patentee may not by claiming a patent on the result or function of a machine extend his patent to devices or mechanisms not described in the patent.”<sup>10</sup> In accordance with that principle, the *Holland* Court invalidated “a patent describ[ing] a process for making glue from starch” “having substantially the properties of animal glue.”<sup>11</sup> Because the inventive ingredient was “described, not in terms of its own physical characteristics or chemical properties or those of the product, but wholly in terms of the manner of use of the product,” a patent would “enable the inventor . . . [to] foreclose efforts to discover other and better types” of glue.<sup>12</sup> But “an inventor may not describe a particular starch glue which will perform the function of animal glue and then claim all starch glues which have those functions.”<sup>13</sup> “One attempting to use or avoid the use of [the] discovery as so claimed and described functionally could do so only after elaborate experimentation.”<sup>14</sup> “The patent monopoly would thus be extended beyond the discovery, and would discourage rather than promote invention.”<sup>15</sup>

The Court reaffirmed the prohibition on functional claiming ten years later in *General Electric Co. v. Wabash Appliance Corp.*, and then again in *United Carbon Co. v. Binney & Smith Co.*<sup>16</sup> In *General Electric*, the Court invalidated a “‘wholly’ functional” claim on a tungsten

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<sup>7</sup> 56 U.S. (15 How.) 62, 86 (1854).

<sup>8</sup> *Id.* at 113. Notably, the reasoning for invalidating Morse’s claim was recently quoted in full in the Supreme Court’s unanimous opinion in *Mayo Collaborative Services v. Prometheus Laboratories, Inc.*, 132 S. Ct. 1289, 1301 (2012).

<sup>9</sup> *O’Reilly*, 56 U.S. at 113; see *Le Roy v. Tatham*, 55 U.S. (14 How.) 156, 175 (1853) (Allowing patentees to claim results “would prohibit all other persons from making the same thing by any means whatsoever, . . . discourag[ing] arts and manufacturers, against the avowed policy of the patent laws.”).

<sup>10</sup> 277 U.S. 245, 257 (1928) (citing *O’Reilly*, 56 U.S. at 112, 113; *Knapp v. Morss*, 150 U.S. 221 (1893); *Elec. R.R. Signal Co. v. Hall Ry. Signal Co.*, 114 U.S. 87 (1885); *Boyden Power-Brake Co. v. Westinghouse*, 170 U.S. 537 (1898); *Mitchell v. Tilghman*, 86 U.S. 287 (1873); *Fuller v. Yentzer*, 94 U.S. 288 (1876); *Risdon Iron & Locomotive Works v. Medart*, 158 U.S. 68 (1895)).

<sup>11</sup> 277 U.S. at 248, 250.

<sup>12</sup> *Id.* at 256-57.

<sup>13</sup> *Id.* at 256.

<sup>14</sup> *Id.* at 257.

<sup>15</sup> *Id.*; see *id.* at 257-58 (A patentee simply may not “broaden” his claims “by describing the product exclusively in terms of its use or function.” “As a description of the invention, it is insufficient, and, if allowed, would extend the monopoly beyond the invention.”).

<sup>16</sup> 304 U.S. 364 (1938); 317 U.S. 228 (1942).

filament for light bulbs and made clear that the “vice of a functional claim exists” when the inventor “recites what has already been seen, and then uses conveniently functional language at the exact point of novelty.”<sup>17</sup> As the Court explained, concerns with functional claiming go to the heart of the basic patent bargain. “The limits of a patent must be known for the protection of the patentee, the encouragement of the inventive genius of others, and the assurance that the subject of the patent will be dedicated ultimately to the public.”<sup>18</sup> Four years later in *United Carbon Co. v. Binney & Smith Co.* (in the course of invalidating a patent claim “relating to carbon black in aggregated form and the process for its conversion to that form”), the Court again announced “the rule that a patentee may not broaden his claims by describing the product in terms of function.”<sup>19</sup> “The statutory requirement of particularity and distinctness in claims is met only when they clearly distinguish what is claimed from what went before . . . and clearly circumscribe what is foreclosed from future enterprise.”<sup>20</sup> Sustaining claims described in functional terms “would be in direct contravention of the public interest” and create “[a] zone of uncertainty which enterprise and experimentation may enter only at the risk of infringement,” which “would discourage invention only a little less than unequivocal foreclosure of the field.”<sup>21</sup>

To the extent that any doubt remained about the validity of functional claiming following *O’Reilly*, *Holland*, *General Electric*, and *United Carbon*, the Supreme Court’s 1946 decision in *Halliburton Oil Well Cementing Co. v. Walker* eliminated it.<sup>22</sup> In *Halliburton*, the Court invalidated a patent claim for a “tuned acoustical means which performs the functions of a sound filter” because “[t]he language of the claim . . . describes this most crucial element in the ‘new’ combination in terms of what it will do rather than in terms of its own physical characteristics or its arrangement in the new combination apparatus.”<sup>23</sup> By using such loose functional language, what the patentee attempted to claim was “any device heretofore or hereafter invented” which “performs the function of clearly and distinctly catching and recording echoes from tubing joints.”<sup>24</sup> Speaking in the context of 1946, the Court said that “[i]n this age of technological development there may be many other devices beyond our present information or indeed our imagination which will perform that function and yet fit these claims. And unless frightened from the course of experimentation by broad functional claims like these, inventive genius may evolve many more devices to accomplish the same purpose.”<sup>25</sup>

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<sup>17</sup> 304 U.S. at 371.

<sup>18</sup> *Id.* at 369; *see id.* at 371 (A “patentee may not broaden his [patent] claims by describing the product in terms of function.”); *cf. Halliburton Energy*, 514 F.3d at 1255 (discussing *General Electric*).

<sup>19</sup> 317 U.S. at 228-29, 234.

<sup>20</sup> *Id.* at 236.

<sup>21</sup> *Id.* at 233, 236; *cf. Halliburton Energy*, 514 F.3d at 1255 (discussing *United Carbon*).

<sup>22</sup> 329 U.S. 1 (1946).

<sup>23</sup> *Id.* at 7, 9.

<sup>24</sup> *Id.* at 12.

<sup>25</sup> *Id.* *O’Reilly*, *General Electric*, *United Carbon*, and *Halliburton* all relied, at least in part, on text from then-governing patent statutes resembling current § 112 ¶ 2 when holding functional claims invalid. *See O’Reilly*, 56 U.S. at 135 (a patentee must “particularly specify what he claims as his invention”); *General Electric*, 304 U.S. at 369 (a patentee is required to “particularly point out and distinctively claim the part, improvement, or combination which he

Congress did change the landscape somewhat in the 1952 Patent Act. But while some contend that Congress eliminated the prohibition on functional claiming and overruled *Halliburton*, that is not so. As relevant here, the 1952 Act provided that:

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.<sup>26</sup>

As the text makes clear, the 1952 Patent Act did not give patent applicants carte blanche to engage in functional claiming. Instead, by enacting § 112 ¶ 6 (then ¶ 3), Congress expressly permitted a patentee to use functional language in “[a]n element in a claim for a combination” so long as the claim was sufficiently limited by structures and actions set forth elsewhere in the patent. Thus a patent applicant may use functional language in an element in a claim, but in order to do so the applicant must detail the specific structure, material, or acts of the invention in the specification. The claim term is then limited in scope to those specific structures, materials, or acts and their equivalents.<sup>27</sup>

To be sure, the Supreme Court has stated that “Congress enacted § 112, ¶ 6, in response to *Halliburton*.”<sup>28</sup> But it is a mistake to overread Congress’ response to *Halliburton* as lifting the longstanding ban on functional claiming. Indeed, it should not be lightly inferred that Congress intended to displace nearly a century of precedent that reflects considerations at the heart of the patent bargain, particularly when a more modest and compelling explanation for § 112 ¶ 6 exists.<sup>29</sup> Before the 1952 Act, it was clear that functional claims were invalid. It was not clear, however, whether a claim using functional language and lacking structure could be salvaged by the provision of structure in the patent specification. The Supreme Court grappled with that issue in both *General Electric* and *United Carbon*. Hedging its bets, the *General Electric* Court concluded that even “[a]ssuming that in a proper case a claim may be upheld by reference to the descriptive part of the specification in order to give definite content to elements stated in the claim in broad functional terms,” the claims in that case could not “be validated by reference to the specification.”<sup>30</sup> Similarly, in *United Carbon*, the Court stated that “[a]ssuming” that the claims at issue could “be read in light of the patent specification,” “the description in the

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claims as his inventive discovery”); *United Carbon*, 317 U.S. at 232 (same); *Halliburton*, 329 U.S. at 9 (same).

<sup>26</sup> Pub. L. No. 593, ch. 950, § 112, 66 Stat. 792, 798-99. This provision is now codified as 35 U.S.C. § 112 ¶ 6.

<sup>27</sup> See *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 28 (1997) (“Section 112, ¶ 6, now expressly allows so-called ‘means’ claims, with the proviso that application of the broad literal language of such claims must be limited to only those means that are ‘equivalen[t]’ to the actual means shown in the patent specification.” (alteration in original)).

<sup>28</sup> *Id.* at 27.

<sup>29</sup> *Cf. Warner-Jenkinson*, 520 U.S. at 28 (Recognizing, albeit in addressing a different argument, that “§ 112, ¶ 6, was enacted as a targeted cure for a specific problem, and . . . such limited congressional action should not be overread.”).

<sup>30</sup> 304 U.S. at 373.

specification is itself almost entirely in terms of function,” and would not save the claims.<sup>31</sup> The inclusion of § 112 ¶ 6 in the 1952 Act simply eliminated the need for judicial assumption with respect to elements in combination claims using specific functional language.

Moreover, the sources typically cited in support of the proposition that § 112 ¶ 6 was meant to overrule the *Halliburton* line of cases are unpersuasive. The Federal Circuit’s 1994 decision in *In re Donaldson Co.* is demonstrative.<sup>32</sup> In that case, the Federal Circuit stated that § 112 ¶ 6 was enacted “to statutorily overrule” *Halliburton*.<sup>33</sup> In support of that proposition, *Donaldson* cited only one source: *In re Fuetterer*, a 1963 opinion of the U.S. Court of Customs and Patent Appeals.<sup>34</sup> But the primary evidence that *Fuetterer* provides in support of this contention is a speech delivered by Representative Joseph R. Bryson—the chairman of the committee “in charge of the legislation which resulted in the Patent Act of 1952”—to the Philadelphia Patent Law Association on January 24, 1952, providing that “the provision in the bill for functional claiming” “will give statutory sanction to combination claiming as it was understood before the *Halliburton* decision. All the elements of a combination now will be able to be claimed in terms of what they do as well as in terms of what they are.”<sup>35</sup> Setting aside whether the extra-legislative statement of a single member should drive the interpretation of a statute (it should not, and the Supreme Court would attribute little import to such quasi-legislative history<sup>36</sup>), Representative Bryson’s Philadelphia remarks fail to provide support for functional claiming. As discussed *supra*, it was already “well understood” that a patent claim could not rely on functional language alone.<sup>37</sup> Moreover, Representative Bryson’s speech does

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<sup>31</sup> 317 U.S. at 235-36.

<sup>32</sup> 16 F.3d 1189, 1194 (Fed. Cir. 1994).

<sup>33</sup> *Id.*

<sup>34</sup> 319 F.2d 259, 264 n.11 (C.C.P.A. 1963).

<sup>35</sup> *Id.* *In re Swinehart*, 439 F.2d 210, 212 n.3 (C.C.P.A. 1971), discussed *infra*, also relies on *Fuetterer*—and nothing else—to support its claim that the use of broad functional language in claims was “in accord with [the views] of Congress.”

<sup>36</sup> *Cf. W. Air Lines, Inc. v. Bd. of Equalization of State of S.D.*, 480 U.S. 123, 130 n\* (1987) (an “attempt at the creation of legislative history through *post hoc* statements . . . is entitled to no weight”). There is little legislative history of the sort the Court might find relevant. The Reviser’s Note says only that “[a] new paragraph relating to functional claims is added.” Reviser’s Note, 35 U.S.C. § 112, H.R. Rep. No. 82-1923, at 19 (1952).

<sup>37</sup> Notably, the statement in *Warner-Jenkinson* that “Congress enacted § 112, ¶ 6, in response to *Halliburton*,” 520 U.S. at 27, relied on *Donaldson* and *Fuetterer* for support. The only other source cited in support of that proposition was a treatise’s reference to the statements of P.J. Federico, the Examiner-in-Chief of the U.S. Patent Office in 1954. But that source provides even less support for the assertion that § 112 ¶ 6 overruled *Halliburton* than *Donaldson* and *Fuetterer*. In discussing the contents of the 1952 Act, Federico stated that it was “unquestionable that some measure of greater liberality in the use of functional expressions in combination claims is authorized than had been permitted by some court decisions, and that decisions such as that in *Halliburton* . . . are modified or rendered obsolete . . . .” P.J. Federico, *Commentary on the New Patent Act* (1954), reprinted in 75 J. PAT. & TRADEMARK OFF. SOC’Y 161, 186 (1993). He also recognized, however, that “the exact limits of the enlargement” in the permitted use of “functional expressions” “remain[s] to be determined.” *Id.* And, in all events,

not expressly disclaim the need for associated structure. In any case, § 112 ¶ 6 as enacted would not support such a claim, and it is that text that governs.<sup>38</sup>

In all events, the notion that § 112 ¶ 6 statutorily overruled *Halliburton* is undermined by the fact that the claims at issue in *Halliburton* would likely be invalid under § 112 ¶ 6. The *Halliburton* Court noted that “[n]either in the specification, the drawing, nor in the claims here under consideration, was there any indication that the patentee contemplated any specific structural alternative for the acoustical resonator or for the resonator’s relationship to the other parts of the machine.”<sup>39</sup> Thus, even though § 112 ¶ 6 allows a patentee to limit a claim using functional language by providing sufficient structure in the specification, the patentee in *Halliburton* failed to do so and his claims would still be invalid.

A handful of the opinions of the Federal Circuit and its predecessor have stated that “‘there is nothing intrinsically wrong with’ using functional language in claims,” which has led some to contend that functional claiming is permissible.<sup>40</sup> But such cases are not in conflict with the requirement that such language be supported by sufficient structure, either in the claim or (when § 112 ¶ 6 applies) in the specification to avoid invalidation under § 112 ¶ 2. To say that there is “nothing intrinsically wrong with” the use of functional language in claims is not the same as saying that functional language suffices even when untethered from sufficient structure, be it in the claims or in the specification. And to the extent that cases using the “intrinsically wrong” formulation stand for the proposition that functional language can be used in a claim without supporting structure anywhere in the patent, those cases are in conflict with the Supreme Court precedent described *supra*, numerous other Federal Circuit precedents requiring that functional language in claims be limited by sufficient structure, and without textual support in the Patent Act.<sup>41</sup>

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Federico’s post-Act commentary “is not legislative history . . . that may be relied upon to indicate Congressional intent. Even if it were, the comments contained therein do not suggest that Federico knew of any particular intent *by Congress* regarding the manner in which the sixth paragraph, then the third paragraph, should be applied. In this particular, he was merely stating his personal views.” *In re Donaldson Co.*, 16 F.3d at 1193 n.3.

<sup>38</sup> See, e.g., *Diamond v. Chakrabarty*, 447 U.S. 303, 308 (1980) (“courts ‘should not read into the patent laws limitations and conditions which the legislature has not expressed’” (quoting *United States v. Dubilier Condenser Corp.*, 289 U.S. 178, 199 (1933))).

<sup>39</sup> 329 U.S. at 11.

<sup>40</sup> *Halliburton Energy*, 514 F.3d at 1255 (quoting *In re Swinehart*, 439 F.2d at 212); see *In re Schreiber*, 128 F.3d 1473, 1478 (Fed. Cir. 1997) (“A patent applicant is free to recite features of an apparatus either structurally or functionally.” (citing *Swinehart*, 439 F.2d at 212)).

<sup>41</sup> Taking a cue from *Swinehart*, some contend that “the use of functional language” is a “practical necessity.” 439 F.2d at 212. Were such language proscribed, the argument goes, drafting claims would be too difficult an enterprise. But, as the Supreme Court made clear in *General Electric*, while the “difficulty of making adequate description may have some bearing on the sufficiency of the description attempted, . . . it cannot justify a claim describing nothing new except perhaps in functional terms.” 304 U.S. at 372-73. “Congress requires, for the protection of the public, that the inventor set out a definite limitation on his patent; that condition must be satisfied before the monopoly is granted.” *Id.*

To sum up, the 1952 Act did not lift the ban on functional claiming. Instead, it permitted functional language in a claim to be limited by structure provided in the specification rather than the claim itself under the terms the Act delineates. In fact, § 112 ¶ 6 reinforces the insistence on limiting patents to specific structures and actions described in the *Halliburton* line of cases. The result is still that patent scope is limited to specific structure, materials, or acts (and their equivalents). The only difference is that the patent applicant may identify the necessary structure, materials, or acts either in the claim language or—pursuant to § 112 ¶ 6—in the specification. The requirement that sufficient structure is necessary to avoid invalidation remains.<sup>42</sup>

## **II. Structure Is Sufficient Only When It Provides, At A Minimum, All The Information Necessary To Perform The Specified Function.**

Maintaining a high threshold for what counts as sufficient structure is critically important. The Supreme Court has time and again stressed that our patent system should work to protect future innovation. Most recently, in *Mayo Collaborative Services v. Prometheus Laboratories, Inc.*, a unanimous Court noted that it had “repeatedly emphasized” “that patent law” should not operate so as to “inhibit further discovery” and “future innovation.”<sup>43</sup> Broad and ambiguous patents that rely on functional claims do just that, as the Supreme Court has long recognized. Such patents chill innovation by creating “[a] zone of uncertainty which enterprise and experimentation may enter only at the risk of infringement,”<sup>44</sup> making companies “hesita[nt] to invest in technology.”<sup>45</sup> Conversely, patents with well-defined boundaries “can increase innovation by encouraging collaboration, technology transfer and design-around.”<sup>46</sup> And

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<sup>42</sup> Accordingly, “software-related claims that do not invoke” 35 U.S.C. § 112 ¶ 6, “but do recite functional language” are indefinite under 35 U.S.C. § 112 ¶ 2 if they lack sufficient structure. 78 Fed. Reg. at 294. “[S]ufficient definiteness” cannot be established by functional language alone or functional language accompanied by insufficient structure in the claim. *Id.*

<sup>43</sup> 132 S. Ct. at 1301.

<sup>44</sup> *United Carbon*, 317 U.S. at 236; JAMES BESSEN & MICHAEL J. MEURER, PATENT FAILURE 9 (2008) (Ambiguous patents “subject[] technology investors to an unavoidable risk of disputes and litigation. The expected cost of inadvertent infringement imposes a *disincentive* on technology investors.”).

<sup>45</sup> FED. TRADE COMM’N, THE EVOLVING IP MARKETPLACE: ALIGNING PATENT NOTICE AND REMEDIES WITH COMPETITION 3 (2011) (“2011 IP REPORT”).

<sup>46</sup> *Id.*; see *Examination Guidelines*, 76 Fed. Reg. at 7,163-64 (“Optimizing patent quality by providing clear notice to the public of the boundaries of the inventive subject matter protected by a patent grant fosters innovation and competitiveness.”). Both the Supreme Court and the Federal Circuit have long recognized the importance of patents with clearly defined boundaries. See, e.g., *Permutit Co. v. Graver Co.*, 284 U.S. 52, 60 (1931) (“The statute requires the patentee . . . to inform the public during the life of the patent of the limits of the monopoly asserted, so that it may be known which features may be safely used or manufactured without a license and which may not.”); *Universal Oil Prods. Co. v. Globe Oil & Refining Co.*, 322 U.S. 471, 484-85 (1944) (“The claim is the measure of the grant. The claim is required to be specific for the very purpose of protecting the public against extension of the scope of the patent.” (internal citation

“[c]learly defined patent rights can help companies identify and license technology they wish to develop or adopt.”<sup>47</sup>

As the Federal Circuit has recognized, the legal question of whether a patent claim or specification contains sufficient structure is “a difficult one that is highly dependent on context.”<sup>48</sup> That said, precedent provides the broad strokes and some useful bounds. As a general matter, “structure (or material or acts) of a means (or step)-plus-function limitation must be disclosed in the specification itself in a way that one skilled in the art will understand what structure (or materials or acts) will perform the recited function.”<sup>49</sup> For the structure to be sufficient, “a person experienced in the field of invention [must be able to] understand the scope of the subject matter that is patented when the claim is read in conjunction with the rest of the specification.”<sup>50</sup> Without sufficient specificity, a patentee is simply patenting the function and every possible method of implementation—something the Supreme Court has long forbidden and the patent law does not allow.<sup>51</sup>

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omitted)); *Hearing Components, Inc. v. Shure Inc.*, 600 F.3d 1357, 1367 (Fed. Cir. 2010) (“[T]he purpose of the definiteness requirement is to ensure that the claims . . . adequately perform their function of notifying the public of the scope of the patentee’s rights to exclude.”); *All Dental Prodx, LLC v. Advantage Dental Prods., Inc.*, 309 F.3d 774, 779 (Fed. Cir. 2002) (“The primary purpose of the definiteness requirement is to ensure that the claims are written in such a way that they give notice to the public of the extent of the legal protection afforded by the patent, so that interested members of the public, e.g., competitors of the patent owner, can determine whether or not they infringe.”).

<sup>47</sup> 2011 IP REPORT 3.

<sup>48</sup> *Halliburton Energy*, 514 F.3d at 1255. “Determining the claimed function and the corresponding structure for a claim . . . are both matters of claim construction” presenting “issues of law that” the Federal Circuit reviews *de novo*. *WMS Gaming Inc. v. Int’l Game Tech.*, 184 F.3d 1339, 1347 (Fed. Cir. 1999); see *Personalized Media Commcn’s, LLC v. Int’l Trade Comm’n*, 161 F.3d 696, 705 (Fed. Cir. 1998) (“A determination of claim indefiniteness is a legal conclusion that is drawn from the court’s performance of its duty as the construer of patent claims.”).

<sup>49</sup> MANUAL OF PATENT EXAMINING PROCEDURE § 2181 II.A.

<sup>50</sup> *Typhoon Touch Techs., Inc. v. Dell, Inc.*, 659 F.3d 1376, 1384 (Fed. Cir. 2011) (quoting *S3 Inc. v. nVIDIA Corp.*, 259 F.3d 1364, 1367 (Fed. Cir. 2001)); see 2011 IP REPORT 102 (Structure must be “sufficiently detailed” so as “to inform the public of the specific means that are and are not encompassed in the applicant’s invention.”).

<sup>51</sup> See DAN L. BURK & MARK A. LEMLEY, *THE PATENT CRISIS AND HOW THE COURTS CAN SOLVE IT* 61-62, 102 (2009) (Allowing functional claims with “little or no description of how to achieve” the specified function presents the very real danger that such claims will be construed to cover later-developed technologies that “seem to bear only a passing resemblance to what the inventor originally built or described.”); *Examination Guidelines*, 76 Fed. Reg. at 7,165 (“[W]hen claims merely recite a description of a problem to be solved or a function or result achieved by the invention, the boundaries of the claim scope may be unclear. Further, without reciting the particular structure, materials or steps that accomplish the function or achieve the result, all means or methods of resolving the problem may be encompassed by the claims.”); *id.*

In the context of computer-implemented inventions such as software, the Federal Circuit has construed these general requirements to mean that structure is sufficient when it is “adequate . . . to render the bounds of the claim understandable to one of ordinary skill in the art.”<sup>52</sup> While a patent applicant does not need to “produce a listing of source code,”<sup>53</sup> he must provide—at a minimum—a “step-by-step process” for achieving or controlling the claimed means.<sup>54</sup> In patents that provide sufficient structure, this requirement is usually met by a detailed algorithm describing how “to transform the general purpose computer or microprocessor disclosed in the specification” into “the special purpose computer” that accomplishes the stated function.<sup>55</sup> The algorithm disclosed must “do more than parrot the recited function;” it must “describe a means for achieving a particular outcome, not merely the outcome itself.”<sup>56</sup> “Requiring disclosure of an algorithm properly defines the scope of the claim and prevents pure functional claiming.”<sup>57</sup> When “there is no algorithm described in any form” and the “specification merely provides functional language and does not contain any step-by-step process for controlling the [claimed] means,” a claim is “indefinite for failure to disclose corresponding structure.”<sup>58</sup>

Reflecting the stringent nature of the test for whether structure is sufficient, the Federal Circuit has compiled a long list of what claimed structure falls short. Fundamentally, “[i]t is not enough for the patentee simply to state or later argue that persons of ordinary skill in the art would know what structures to use to accomplish the claimed function.”<sup>59</sup> “[A] bare statement that known techniques or methods can be used does not disclose structure.”<sup>60</sup> Moreover,

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at 7,163 (“providing clear notice to the public of the boundaries of the inventive subject matter protected by a patent grant fosters innovation and competitiveness”).

<sup>52</sup> *AllVoice*, 504 F.3d at 1245.

<sup>53</sup> *Aristocrat Techs. Austral. Pty Ltd. v. Int’l Game Tech.*, 521 F.3d 1328, 1338 (Fed. Cir. 2008); see *Typhoon Touch*, 659 F.3d at 1385 (“the computer code is not required to be included in the patent specification”).

<sup>54</sup> *Ergo Licensing, LLC v. CareFusion 303, Inc.*, 673 F.3d 1361, 1365 (Fed. Cir. 2012).

<sup>55</sup> *Examination Guidelines*, 76 Fed. Reg. at 7,168; *id.* (“The specification must explicitly disclose the algorithm for performing the claimed function.”); *Harris Corp. v. Ericsson Inc.*, 417 F.3d 1241, 1253 (Fed. Cir. 2005) (A “computer-implemented means-plus-function term is limited to the corresponding structure disclosed in the specification and equivalents thereof, and the corresponding structure is the algorithm.”).

<sup>56</sup> *HTC Corp. v. IPCom GmbH & Co., KG*, 667 F.3d 1270, 1280 (Fed. Cir. 2012); see *Finisar Corp. v. DirecTV Grp., Inc.*, 523 F.3d 1323, 1340 (Fed. Cir. 2008) (a restatement of the function is insufficient).

<sup>57</sup> *Ergo Licensing*, 673 F.3d at 1364.

<sup>58</sup> *Id.* at 1365.

<sup>59</sup> *Aristocrat*, 521 F.3d at 1336-37; see *Atmel Corp. v. Info. Storage Devices, Inc.*, 198 F.3d 1374, 1380 (Fed. Cir. 1999) (“[C]onsideration of the understanding of one skilled in the art in no way relieves the patentee of adequately disclosing sufficient structure in the specification.”).

<sup>60</sup> *Biomedino, LLC v. Waters Techs. Corp.*, 490 F.3d 946, 953 (Fed. Cir. 2007); see *id.* at 949, 952 (holding indefinite a claimed “control means for operating valving” where the asserted structure was the disclosure that the invention “may be ‘controlled automatically by known differential pressure, valving and control equipment’”).

“[s]imply reciting ‘software’ without providing some detail about the means to accomplish the function is not enough,”<sup>61</sup> and the Federal Circuit has “consistently required that the structure disclosed in the specification be more than simply a general purpose computer or microprocessor.”<sup>62</sup> Referencing a specialized computer, such as a “bank computer,” or an undefined component of a computer system, such as an “access control manager,” does not meet the requirements of § 112.<sup>63</sup> And describing a “high level process flow,” “results to be obtained[] without describing how to achieve those results,”<sup>64</sup> or a generic “series of decisions and actions” is insufficient.<sup>65</sup>

Viewing the case law discussed to this point as a whole, it is possible to identify the attributes of sufficient structure in a patent covering a computer-implemented invention. While the Federal Circuit has stated that source code is not needed to provide sufficient structure, source code would surely do so, and source code provides a benchmark for the kind of structure that is necessary. Although some cases state that the “description of the algorithm” need not be “highly detailed,” that does not suggest that any algorithm will do; the algorithm must be “detailed.”<sup>66</sup> The algorithm must provide all the “information necessary to perform the function”<sup>67</sup> (just as source code would)—“a finite sequence of steps for solving [the] logical or mathematical problem” the patent addresses.<sup>68</sup> The algorithm “must identify the sequence of steps that the computer will perform in sufficient detail to disclose what is within and what is outside of the patent.”<sup>69</sup> The algorithm provided likely does so if it is specific enough to allow a

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<sup>61</sup> *Finisar*, 523 F.3d at 1340-41; *see Altiris, Inc. v. Symantec Corp.*, 318 F.3d 1363, 1376 (Fed. Cir. 2003) (“merely pointing out that the relevant structure is software rather than hardware is insufficient”).

<sup>62</sup> *Aristocrat*, 521 F.3d at 1333; *see id.* (“For a patentee to claim a means for performing a particular function and then to disclose only a general purpose computer as the structure designed to perform that function amounts to pure functional claiming.”); *HTC Corp.*, 667 F.3d at 1280 (“disclosure of a processor and transceiver” is insufficient). Reciting a computer in an otherwise functional claim does not save the claim from invalidity. Claims that merely reference a computer must provide sufficient structure either in the claim itself or in the specification. *See* 78 Fed. Reg. at 294.

<sup>63</sup> *See Blackboard, Inc. v. Desire2Learn Inc.*, 574 F.3d 1371, 1383-85 (Fed. Cir. 2009); *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1366-67 (Fed. Cir. 2008).

<sup>64</sup> *In re Aoyama*, 656 F.3d at 1298.

<sup>65</sup> Corrected Br. for Appellee-Director of the U.S. Patent and Trademark Office, *In re Aoyama*, 656 F.3d 1293 (Fed. Cir. 2011) (No. 2010-1552), 2011 WL 882026, at \*17; *see Examination Guidelines*, 76 Fed. Reg. at 7,165 (“[W]hen claims merely recite a description of a problem to be solved or a function or result achieved by the invention, the boundaries of the claim scope may be unclear,” “and thus be indefinite.”).

<sup>66</sup> *Aristocrat*, 521 F.3d at 1338 (emphasis added).

<sup>67</sup> *Id.* at 1336.

<sup>68</sup> MANUAL OF PATENT EXAMINING PROCEDURE § 2181 II.B (quoting MICROSOFT COMPUTER DICTIONARY (5th ed. 2002)); *see HTC Corp.*, 667 F.3d at 1280; *see Finisar*, 523 F.3d at 1340.

<sup>69</sup> 2011 IP REPORT 100.

programmer to design around it. When the claimed structure lacks these qualities, it is likely insufficient.<sup>70</sup>

Those seeking to dilute the standard for sufficient structure in the computer-implemented invention context often cite precedent stating that a patentee may express an “algorithm in any understandable terms including as a mathematical formula, in prose,” “as a flowchart, or in any other manner that provides sufficient structure.”<sup>71</sup> This language does not, however, lower the bar for establishing structure. It merely permits the required structure to be presented in a variety of different forms. The structure supplied must still provide all the “information necessary to perform the function.”<sup>72</sup> “Even described ‘in prose,’ an algorithm” is still “a step-by-step procedure for accomplishing a given result.”<sup>73</sup> And “just because a computer program may be described by a flowchart,” that “does not mean that every flowchart . . . describes sufficient structure.”<sup>74</sup> Indeed, it is likely that flowcharts capable of providing sufficient structure will be few and far between.<sup>75</sup>

The PTO is the first and most important line of defense against functional claiming. Verizon appreciates the PTO’s efforts to ensure that only those inventions deserving of patent protection receive such protection, but there is room for improvement. U.S. Patent No. 6,826,620 B1—“[a] network congestion control system and method” for “facilitat[ing] the transmission of information on a communication network”—is a prime example of the type of functional claiming language that should never make it past the PTO.<sup>76</sup> In the background section, the patent states that “there is a need in the industry for a system and method to monitor the congestion notifications . . . and proactively rate control the end user session(s).”<sup>77</sup> Claim 13 then describes:

A computer readable medium having a program for alleviating congestion in a communication network, the communication network enabling the flow of data to

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<sup>70</sup> Whether sufficient structure is provided is an element-by-element determination. *See* MANUAL OF PATENT EXAMINING PROCEDURE § 2181 I.C. (§ 112 ¶ 6 issues must be “decide[d] on an element by element basis”).

<sup>71</sup> *Finisar*, 523 F.3d at 1340; *see Intel Corp. v. VIA Techs., Inc.*, 319 F.3d 1357, 1366 (Fed. Cir. 2003).

<sup>72</sup> *Aristocrat*, 521 F.3d at 1336.

<sup>73</sup> *Ergo Licensing*, 673 F.3d at 1365 (quoting *Typhoon Touch*, 659 F.3d at 1385).

<sup>74</sup> *In re Aoyama*, 656 F.3d at 1297.

<sup>75</sup> In its brief in *In re Aoyama*, the PTO stated that “a flowchart can *sometimes* provide structure for a computer-implemented invention.” Corrected Brief for Appellee-Director of the U.S. Patent and Trademark Office, *In re Aoyama*, 2011 WL 882026, at \*18 (emphasis in original). That statement also seems to promote the converse proposition—that flowcharts will *often* fail to provide sufficient structure.

<sup>76</sup> U.S. Patent No. 6,826,620 B1 abstract (filed May 3, 1999). Verizon Wireless is currently being sued for allegedly infringing this patent. *See Bandwidth Mgmt. Innovations, LLC v. Cellco Partnership d/b/a Verizon Wireless*, No. 13-191 (D. Del. filed Feb. 5, 2013).

<sup>77</sup> U.S. Patent No. 6,826,620 B1 col.5 ll.58-63.

and from a plurality of end user devices that are connected to the network through a plurality of communication devices, comprising:

logic configured to monitor data flows to and from the plurality of end user devices for indications of congestion; and

logic configured to control the data rate of at least one end user device in response to said congestion indications.<sup>78</sup>

This claim is an example of the type of functional claiming that the Supreme Court has forbidden for more than 150 years.<sup>79</sup> The patent simply identifies a problem and then appears to claim every potential solution to that problem. As a result, the claim is either indefinite under § 112 ¶ 2 or—if § 112 ¶ 6 applies and sufficient structure is provided in the specification—limited to the structure provided in the specification.<sup>80</sup>

While courts can and should hold patentees to the stringent structure requirements we describe, the PTO can do a great service to the patent system and innovating companies by doing so in the first instance. Claims like that just discussed should be rejected. Moreover, as the Federal Circuit has recognized, “the patent drafter is in the best position to resolve the ambiguity in the patent claims, and it is highly desirable that patent examiners demand that applicants do so in appropriate circumstances so that the patent can be amended during prosecution rather than attempting to resolve the ambiguity in litigation.”<sup>81</sup> Accordingly, whenever there is any doubt as to whether an applicant has provided sufficient structure and the limitations are governed by § 112 ¶ 6, the PTO should—as a matter of course—ask the applicant to provide a written explanation as to how the specification provides sufficient structure. If that clarification is insufficient, or if the claims are not governed by § 112 ¶ 6 and a limitation is functional, the PTO should reject the claims.

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Verizon is grateful to the PTO for its efforts to effect positive change in the patent system and for considering these comments. If we can be of any further assistance, please do not hesitate to contact us.

Respectfully submitted,

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<sup>78</sup> *Id.* at claim 13.

<sup>79</sup> When patent examiners permit patent applicants to use language like that employed in claim 13, § 112’s requirements are not “being applied properly during examination.” 78 Fed. Reg. at 294.

<sup>80</sup> Furthermore, regardless of the claim form, claim 13 would be functional. If, for example, claim 13 were rewritten as a method claim, it would be no less functional.

<sup>81</sup> *See Halliburton Energy*, 514 F.3d at 1255.