

160 dB (rms) during impact pile driving for the next season of construction activities if pile driving frequency would be kept at 2008–2009 level. These are small numbers, representing 0.03% of the California stock of harbor seal population (estimated at 34,233; Carretta *et al.* 2010), 0.00% of the U.S. stock of California sea lion population (estimated at 238,000; Carretta *et al.* 2010), 0.05% of the San Francisco-Russian River stock of harbor porpoise population (estimated at 9,181; Carretta *et al.* 2010), and 0.01% of the Eastern North Pacific stock of gray whale population (estimated at 18,813; Allen and Angliss 2010).

Animals exposed to construction noise associated with the SF-OBB construction work would be limited to Level B behavioral harassment only, *i.e.*, the exposure of received levels for impulse noise between 160 and 180 dB (rms) re 1 µPa (from impact pile driving) and for non-impulse noise between 120 and 180 dB (rms) re 1 µPa (from vibratory pile driving). In addition, the potential behavioral responses from exposed animals are expected to be localized and short in duration.

These low intensity, localized, and short-term noise exposures (*i.e.*, 160 dB re 1 µPa (rms) from impulse sources and 120 dB re 1 µPa (rms) from non-impulse sources), are expected to cause brief startle reactions or short-term behavioral modification by the animals. These brief reactions and behavioral changes are expected to disappear when the exposures cease. Therefore, these levels of received underwater construction noise from the proposed SF-OBB construction project are not expected to affect marine mammal annual rates of recruitment or survival. The average measured 160 dB isopleths from impact pile driving is 1,000 m from the pile, and the estimated 120 dB isopleths from vibratory pile driving is approximately 1,900 m from the pile.

For the reasons discussed in this document, NMFS has determined that the impact of in-water pile driving associated with construction of the SF-OBB would result, at worst, in the Level B harassment of small numbers of California sea lions, Pacific harbor seals, harbor porpoises, and potentially gray whales that inhabit or visit SFB in general and the vicinity of the SF-OBB in particular. While behavioral modifications, including temporarily vacating the area around the construction site, may be made by these species to avoid the resultant visual and acoustic disturbance, the availability of alternate areas within SFB and haul-out sites (including pupping sites) and feeding areas within the Bay has led

NMFS to determine that this action will have a negligible impact on California sea lion, Pacific harbor seal, harbor porpoise, and gray whale populations along the California coast.

In addition, no take by Level A harassment (injury or death) is anticipated and harassment takes should be at the lowest level practicable due to incorporation of the mitigation measures mentioned previously in this document. The activity will not have an unmitigable adverse impact on subsistence uses of marine mammals described in MMPA section 101(a)(5)(D)(i)(II).

Impact on Availability of Affected Species for Taking for Subsistence Uses

There are no relevant subsistence uses of marine mammals implicated by this action.

National Environmental Policy Act (NEPA)

NMFS' prepared an Environmental Assessment (EA) for the take of marine mammals incidental to construction of the East Span of the SF-OBB and made a Finding of No Significant Impact (FONSI) on November 4, 2003. Due to the modification of part of the construction project and the mitigation measures, NMFS reviewed additional information from CALTRANS regarding empirical measurements of pile driving noises for the smaller temporary piles without an air bubble curtain system and the use of vibratory pile driving. NMFS prepared a Supplemental Environmental Assessment (SEA) and analyzed the potential impacts to marine mammals that would result from the modification of the action. A Finding of No Significant Impact (FONSI) was signed on August 5, 2009. A copy of the SEA and FONSI is available upon request (*see ADDRESSES*).

Endangered Species Act (ESA)

On October 30, 2001, NMFS completed consultation under section 7 of the ESA with the Federal Highway Administration (FHWA) on the CALTRANS' construction of a replacement bridge for the East Span of the SF-OBB in California. Anadromous salmonids are the only listed species which may be affected by the project. The finding contained in the Biological Opinion was that the proposed action at the East Span of the SF-OBB is not likely to jeopardize the continued existence of listed anadromous salmonids, or result in the destruction or adverse modification of designated critical habitat for these species. Listed marine mammals are not expected to be

in the area of the action and thus would not be affected.

NMFS' issuance of an IHA to CALTRANS constitutes an agency action that authorizes an activity that may affect ESA-listed species and, therefore, is subject to section 7 of the ESA. There is no ESA-listed marine mammal species in the proposed action area, therefore, NMFS has determined that issuance of an IHA for this activity will have no effect on any listed marine mammal species.

Authorization

NMFS has issued an IHA to CALTRANS for the potential harassment of small numbers of harbor seals, California sea lions, harbor porpoises, and gray whales incidental to construction of a replacement bridge for the East Span of the San Francisco-Oakland Bay Bridge in California, provided the previously mentioned mitigation, monitoring, and reporting requirements are incorporated.

Dated: February 2, 2011.

James H. Lecky,

*Director, Office of Protected Resources,
National Marine Fisheries Service.*

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DEPARTMENT OF COMMERCE

Patent and Trademark Office

[Docket No.: PTO-P-2010-0088]

Supplementary Examination Guidelines for Determining Compliance With 35 U.S.C. 112 and for Treatment of Related Issues in Patent Applications

AGENCY: United States Patent and Trademark Office, Commerce.

ACTION: Notice.

SUMMARY: These supplementary guidelines are intended to assist United States Patent and Trademark Office (Office) personnel in the examination of claims in patent applications for compliance with 35 U.S.C. 112, second paragraph, which requires that claims particularly point out and distinctly claim the subject matter that applicant regards as his or her invention. In addition, supplemental information is provided to assist Office personnel in the examination of claims that contain functional language for compliance with 35 U.S.C. 112, especially computer-implemented invention claims. The guidelines also include information to assist Office personnel in the examination of dependent claims for compliance with 35 U.S.C. 112, fourth

paragraph. The guidelines are a supplement to the current provisions in the Manual of Patent Examining Procedure (MPEP) pertaining to 35 U.S.C. 112, and the current provisions in the MPEP pertaining to 35 U.S.C. 112 remain in effect except as where indicated in these guidelines.

DATES: These guidelines and supplemental examination information are effective February 9, 2011. These guidelines and supplemental examination information apply to all applications filed before, on or after the effective date of February 9, 2011.

Comment Deadline Date: To be ensured of consideration, written comments must be received on or before April 11, 2011. No public hearing will be held.

ADDRESSES: Comments concerning these guidelines and supplemental examination information may be sent by electronic mail message over the Internet addressed to *SEGuidelines112@uspto.gov*, or submitted by mail addressed to: Mail Stop Comments—Patents, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313–1450. Although comments may be submitted by mail, the Office prefers to receive comments via the Internet.

The comments will be available for public inspection at the Office of the Commissioner for Patents, located in Madison East, Tenth Floor, 600 Dulany Street, Alexandria, Virginia, and will be available via the USPTO Internet Web site (address: <http://www.uspto.gov>). Because comments will be available for public inspection, information that is not desired to be made public, such as an address or phone number, should not be included in the comments.

FOR FURTHER INFORMATION CONTACT: Caroline D. Dennison, Nicole D. Haines, or Joni Y. Chang, Legal Advisors, Office of Patent Legal Administration, Office of the Associate Commissioner for Patent Examination Policy, by telephone at (571) 272–7729, (571) 272–7717 or (571) 272–7720, or by mail addressed to: Mail Stop Comments—Patents, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313–1450, marked to the attention of Caroline D. Dennison.

SUPPLEMENTARY INFORMATION: These guidelines are intended to assist Office personnel in the examination of claims for compliance with 35 U.S.C. 112, ¶ 2 (§ 112, ¶ 2), which requires that claims particularly point out and distinctly claim the subject matter that applicant regards as his or her invention. In addition, supplemental information is provided to assist Office personnel in the examination of claims that contain

functional language for compliance with 35 U.S.C. 112, especially computer-implemented invention claims. The guidelines also include information to assist Office personnel in the examination of dependent claims for compliance with 35 U.S.C. 112, ¶ 4 (§ 112, ¶ 4). The guidelines and supplemental information are based on the Office's current understanding of the law and are believed to be fully consistent with the binding precedent of the U.S. Supreme Court, the U.S. Court of Appeals for the Federal Circuit (Federal Circuit) and its predecessor courts.

These guidelines and supplemental information do not constitute substantive rule making and hence do not have the force and effect of law. They have been developed as a matter of internal Office management and are not intended to create any right or benefit, substantive or procedural, enforceable by any party against the Office. Rejections will continue to be based upon the substantive law, and it is these rejections that are appealable. Consequently, any failure by Office personnel to follow the guidelines and supplemental information is neither appealable nor petitionable.

These guidelines and supplemental information merely update USPTO examination practice for consistency with the USPTO's current understanding of the case law regarding the requirements of 35 U.S.C. 112. Therefore, these guidelines and supplemental information relate only to interpretative rules, general statements of policy, or rules of agency organization, procedure, or practice. The USPTO is providing this opportunity for public comment because the USPTO desires the benefit of public comment on these guidelines and supplemental information; however, notice and an opportunity for public comment are not required under 5 U.S.C. 553(b) or any other law. See *Cooper Techs. Co. v. Dudas*, 536 F.3d 1330, 1336–37 (Fed. Cir. 2008) (stating that 5 U.S.C. 553, and thus 35 U.S.C. 2(b)(2)(B), do not require notice and comment rule making for

“interpretative rules, general statements of policy, or rules of agency organization, procedure, or practice.” (quoting 5 U.S.C. 553(b)(A))). Persons submitting written comments should note that the USPTO may not provide a “comment and response” analysis of such comments as notice and an opportunity for public comment are not required under 5 U.S.C. 553(b) or any other law.

Part 1: Examination Guidelines for Ensuring Compliance With 35 U.S.C. 112, Second Paragraph—Definite Claim Language

I. Background: 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. Accordingly, providing high quality patents is one of the agency's guiding principles. The Office recognizes that issuing patents with clear and definite claim language is a key component to enhancing the quality of patents and raising confidence in the patent process.

As part of the ongoing efforts to enhance patent quality and continually improve patent examination, the Office is issuing clarifying guidelines on examination of claims under § 112, ¶ 2. This statutory section requires that a patent application specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his or her invention. In patent examining parlance, the claim language must be “definite” to comply with § 112, ¶ 2. Conversely, a claim that does not comply with this requirement of § 112, ¶ 2 is “indefinite.”

It is of utmost importance that patents issue with definite claims that clearly and precisely inform persons skilled in the art of the boundaries of protected subject matter. Therefore, claims that do not meet this standard must be rejected under § 112, ¶ 2 as indefinite. Such a rejection requires that the applicant respond by explaining why the language is definite or by amending the claim, thus making the record clear regarding the claim boundaries prior to issuance. As an indefiniteness rejection requires the applicant to respond by explaining why the language is definite or by amending the claim, such rejections must clearly identify the language that causes the claim to be indefinite and thoroughly explain the reasoning for the rejection.

These guidelines set forth the examining procedure for making such determinations and focus on several key aspects of examining claims under § 112, ¶ 2. The guidelines are a first step toward providing additional examination guidance in this area and may be supplemented in later stages to address further topics relating to definite claim language. This document is not a comprehensive revision of the MPEP. However, it is anticipated that the MPEP will be updated based on a final version of these guidelines, and

those sections of the MPEP directly affected by these guidelines are referenced therein. The current provisions in the MPEP that are consistent with these guidelines remain in effect.

II. Step 1—Interpreting the Claims

A. Broadest Reasonable Interpretation:

Interpretation: The first step to examining a claim to determine if the language is definite is to fully understand the subject matter of the invention disclosed in the application and to ascertain the boundaries of that subject matter encompassed by the claim. During examination, a claim must be given its broadest reasonable interpretation consistent with the specification as it would be interpreted by one of ordinary skill in the art. Because the applicant has the opportunity to amend claims during prosecution, giving a claim its broadest reasonable interpretation will reduce the possibility that the claim, once issued, will be interpreted more broadly than is justified.¹ The focus of the inquiry regarding the meaning of a claim should be what would be reasonable from the perspective of one of ordinary skill in the art.² See MPEP § 2111 for a full discussion of broadest reasonable interpretation.

Under a broadest reasonable interpretation, words of the claim must be given their plain meaning, unless such meaning is inconsistent with the specification. The plain meaning of a term means the ordinary and customary meaning given to the term by those of ordinary skill in the art at the time of the invention. The ordinary and customary meaning of a term may be evidenced by a variety of sources, including the words of the claims themselves, the specification, drawings, and prior art. However, the best source for determining the meaning of a claim term is the specification—the greatest clarity is obtained when the specification serves as a glossary for the claim terms. The presumption that a term is given its ordinary and customary meaning may be rebutted by the applicant by clearly setting forth a different definition of the term in the specification.³ When the specification sets a clear path to the claim language, the scope of the claims is more easily determined and the public notice function of the claims is best served. See MPEP § 2111.01 for a full discussion of the plain meaning of claim language.

B. Claims Under Examination Are Evaluated With a Different Standard Than Patented Claims to Determine Whether the Language Is Definite: Patented claims enjoy a presumption of

validity and are not given the broadest reasonable interpretation during court proceedings involving infringement and validity, and can be interpreted based on a fully developed prosecution record. Accordingly, when possible, courts construe patented claims in favor of finding a valid interpretation. A court will not find a patented claim indefinite unless it is “insolubly ambiguous.”⁴ In other words, the validity of a claim will be preserved if some meaning can be gleaned from the language.

In contrast, no presumption of validity attaches before the issuance of a patent. The Office is not required or even permitted to interpret claims when examining patent applications in the same manner as the courts, which, post-issuance, operate under the presumption of validity.⁵ The Office must construe claims in the broadest reasonable manner during prosecution in an effort to establish a clear record of what applicant intends to claim. In deciding whether a pending claim particularly points out and distinctly claims the subject matter, a lower threshold of ambiguity is applied during prosecution.⁶ The lower threshold is applied because the patent record is in development and not fixed. As such, applicant has the ability to provide explanation and/or amend the claims to ensure that the meaning of the language is clear and definite prior to issuance.⁷

During examination, after applying the broadest reasonable interpretation to the claim, if the metes and bounds of the claimed invention are not clear, the claim is indefinite and should be rejected.⁸ For example, if the language of a claim, given its broadest reasonable interpretation, is such that a person of ordinary skill in the relevant art would read it with more than one reasonable interpretation, then a rejection under § 112, ¶ 2 is appropriate.⁹ Examiners, however, are cautioned against confusing claim breadth with claim indefiniteness. A broad claim is not indefinite merely because it encompasses a wide scope of subject matter provided the scope is clearly defined. Instead, a claim is indefinite when the boundaries of the protected subject matter are not clearly delineated and the scope is unclear. For example, a genus claim that covers multiple species is broad, but is not indefinite because of its breadth, which is otherwise clear. But a genus claim that could be interpreted in such a way that it is not clear which species are covered would be indefinite (e.g., because there is more than one reasonable interpretation of what species are included in the claim). See PART 1, section III.A.4. (below), for more

information regarding the determination of whether a Markush claim satisfies the requirements of § 112, ¶ 2.

C. Determine Whether Each Claim Limitation Invokes 35 U.S.C. 112, ¶ 6 or Not: As part of the claim interpretation analysis, examiners should determine whether each limitation invokes 35 U.S.C. 112, ¶ 6 (112, ¶ 6) or not. If the claim limitation invokes 112, ¶ 6, the claim limitation must “be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.”¹⁰ See PART 1, section III.C. (below), for more information regarding the determination of whether a limitation invokes 112, ¶ 6, and means-plus-function claim limitations.

III. Step 2—Determining Whether Claim Language Is Definite: During prosecution, applicant has an opportunity and a duty to amend ambiguous claims to clearly and precisely define the metes and bounds of the claimed invention. The claim places the public on notice of the scope of the patentee’s right to exclude.¹¹ As the Federal Circuit stated in *Halliburton Energy Services*:

We note that 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.¹²

A decision on whether a claim is indefinite under § 112, ¶ 2 requires a determination of whether those skilled in the art would understand what is claimed when the claim is read in light of the specification.¹³ Claim terms are typically given their ordinary and customary meaning as understood by one of ordinary skill in the pertinent art, and the generally understood meaning of particular terms may vary from art to art. Therefore, it is important to analyze claim terms in view of the application’s specification from the perspective of those skilled in the relevant art since a particular term used in one patent or application may not have the same meaning when used in a different application.¹⁴

The following sections highlight certain areas in which questions of definiteness commonly arise.

A. Indeterminate Terms

1. Functional Claiming: A claim term is functional when it recites a feature “by what it does rather than by what it is.”¹⁵ There is nothing intrinsically wrong with the use of such claim language.¹⁶ In fact, § 112, ¶ 6, expressly authorizes a form of functional claiming

(means-plus-function claim limitations discussed in III.C. below). Functional language may also be employed to limit the claims without using the means-plus-function format.¹⁷ Unlike means-plus-function claim language that applies only to purely functional limitations,¹⁸ functional claiming often involves the recitation of some structure followed by its function. For example, in *In re Schreiber*, the claims were directed to a conical spout (the structure) that “allow[ed] several kernels of popped popcorn to pass through at the same time” (the function).¹⁹ As noted by the court in *Schreiber*, “[a] patent applicant is free to recite features of an apparatus either structurally or functionally.”²⁰

Notwithstanding the permissible instances, the use of functional language in a claim may fail “to provide a clear-cut indication of the scope of the subject matter embraced by the claim” and thus be indefinite.²¹ For example, when 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.²² 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 claim.²³ Unlimited functional claim limitations that extend to all means or methods of resolving a problem may not be adequately supported by the written description or may not be commensurate in scope with the enabling disclosure,²⁴ both of which are required by § 112, ¶ 1.²⁵ For instance, a single means claim covering every conceivable means for achieving the stated result was held to be invalid under § 112, ¶ 1 because the court recognized that the specification, which disclosed only those means known to the inventor, was not commensurate in scope with the claim.²⁶ For more information regarding the written description requirement and enablement requirement under § 112, ¶ 1, see MPEP §§ 2161–2164.08(c) and PART 2, sections I and II (below).

When a claim limitation employs functional language, the examiner’s determination of whether the limitation is sufficiently definite will be highly dependent on context (e.g., the disclosure in the specification and the knowledge of a person of ordinary skill in the art).²⁷ For example, a claim that included the term “fragile gel” was found to be indefinite because the definition of the term in the specification was functional, *i.e.*, the fluid is defined by what it does rather than what it is (“ability of the fluid to

transition quickly from gel to liquid, and the ability of the fluid to suspend drill cuttings at rest”), and it was ambiguous as to the requisite degree of the fragileness of the gel, the ability of the gel to suspend drill cuttings (*i.e.*, gel strength), and/or some combination of the two.²⁸ In another example, the claims directed to a tungsten filament for electric incandescent lamps were held invalid for including a limitation that recited “comparatively large grains of such size and contour as to prevent substantial sagging or offsetting during a normal or commercially useful life for such a lamp or other device.”²⁹ The court observed that the prior art filaments also “consisted of comparatively large crystals” but they were “subject to offsetting” or shifting, and the court further found that the phrase “of such size and contour as to prevent substantial sagging and offsetting during a normal or commercially useful life for a lamp or other device” did not adequately define the structural characteristics of the grains (e.g., the size and contour) to distinguish the claimed invention from the prior art.³⁰ Similarly, a claim was held invalid because it recited “substantially (sic) pure carbon black in the form of commercially uniform, comparatively small, rounded smooth aggregates having a spongy or porous exterior.”³¹ In the latter example, the Court observed various problems with the limitation: “commercially uniform” meant only the degree of uniformity buyers desired; “comparatively small” did not add anything because no standard for comparison was given; and “spongy” and “porous” are synonyms that the Court found unhelpful in distinguishing the claimed invention from the prior art.³²

In comparison, a claim limitation reciting “transparent to infrared rays” was held to be definite because the specification showed that a substantial amount of infrared radiation was always transmitted even though the degree of transparency varied depending on certain factors.³³ Likewise, the claims in another case were held definite because applicant provided “a general guideline and examples sufficient to enable a person of ordinary skill in the art to determine whether a process uses a silicon dioxide source ‘essentially free of alkali metal’ to make a reaction mixture ‘essentially free of alkali metal’ to produce a zeolitic compound ‘essentially free of alkali metal.’”³⁴

Examiners should consider the following factors when examining claims that contain functional language to determine whether the language is ambiguous: (1) Whether there is a clear

cut indication of the scope of the subject matter covered by the claim; (2) whether the language sets forth well-defined boundaries of the invention or only states a problem solved or a result obtained; and (3) whether one of ordinary skill in the art would know from the claim terms what structure or steps are encompassed by the claim. These factors are examples of points to be considered when determining whether language is ambiguous and are not intended to be all inclusive or limiting. Other factors may be more relevant for particular arts. The primary inquiry is whether the language leaves room for ambiguity or whether the boundaries are clear and precise.

During prosecution, applicant may resolve the ambiguities of a functional limitation in a number of ways. For example: (1) “The ambiguity might be resolved by using a quantitative metric (e.g., numeric limitation as to a physical property) rather than a qualitative functional feature;”³⁵ (2) applicant could demonstrate that the “specification provide[s] a formula for calculating a property along with examples that meet the claim limitation and examples that do not;”³⁶ (3) applicant could demonstrate that the specification provides a general guideline and examples sufficient to teach a person skilled in the art when the claim limitation was satisfied;³⁷ or (4) applicant could amend the claims to recite the particular structure that accomplishes the function.

2. Terms of Degree: When a term of degree is used in the claim, the examiner should determine whether the specification provides some standard for measuring that degree.³⁸ If the specification does not provide some standard for measuring that degree, a determination must be made as to whether one of ordinary skill in the art could nevertheless ascertain the scope of the claim (e.g., a standard that is recognized in the art for measuring the meaning of the term of degree).³⁹ The claim is not indefinite if the specification provides examples or teachings that can be used to measure a degree even without a precise numerical measurement (e.g., a figure that provides a standard for measuring the meaning of the term of degree).⁴⁰ During prosecution, an applicant may also overcome an indefiniteness rejection by submitting a declaration under 37 CFR 1.132 showing examples that meet the claim limitation and examples that do not.⁴¹

3. Subjective Terms: When a subjective term is used in the claim, the examiner should determine whether the specification supplies some standard for

measuring the scope of the term, similar to the analysis for a term of degree. Some objective standard must be provided in order to allow the public to determine the scope of the claim. A claim that requires the exercise of subjective judgment without restriction may render the claim indefinite.⁴² Claim scope cannot depend solely on the unrestrained, subjective opinion of a particular individual purported to be practicing the invention.⁴³

For example, in *Datamize*, the invention was directed to a computer interface screen with an “aesthetically pleasing look and feel.”⁴⁴ The meaning of the term “aesthetically pleasing” depended solely on the subjective opinion of the person selecting features to be included on the interface screen. Nothing in the intrinsic evidence (*e.g.*, the specification) provided any guidance as to what design choices would result in an “aesthetically pleasing” look and feel.⁴⁵ The claims were held indefinite because the interface screen may be “aesthetically pleasing” to one user but not to another.⁴⁶

During prosecution, the applicant may overcome a rejection by providing evidence that the meaning of the term can be ascertained by one of ordinary skill in the art when reading the disclosure, or by amending the claim to remove the subjective term.

4. Markush Groups: A “Markush” claim recites a list of alternatively useable species.⁴⁷ A Markush claim is commonly formatted as: “selected from the group consisting of A, B, and C;” however, the phrase “Markush claim” as used in these guidelines means any claim that recites a list of alternatively useable species regardless of format. A Markush claim may encompass a large number of alternative species, but is not necessarily indefinite under § 112, ¶2 for such breadth.⁴⁸ In certain circumstances, however, a Markush group may be so expansive that persons skilled in the art cannot determine the metes and bounds of the claimed invention. For example, a Markush group that encompasses a massive number of distinct alternative species may be indefinite under § 112, ¶2 if one skilled in the art cannot determine the metes and bounds of the claim due to an inability to envision all of the members of the Markush group. In such a circumstance, an examiner may reject the claim for indefiniteness under § 112, ¶2.

In addition, a Markush claim may be rejected under the judicially approved “improper Markush grouping” doctrine when the claim contains an improper grouping of alternatively useable

species.⁴⁹ A Markush claim contains an “improper Markush grouping” if: (1) The species of the Markush group do not share a “single structural similarity,”⁵⁰ or (2) the species do not share a common use. Members of a Markush group share a “single structural similarity” when they belong to the same recognized physical or chemical class or to the same art-recognized class. Members of a Markush group share a common use when they are disclosed in the specification or known in the art to be functionally equivalent.⁵¹ When an examiner determines that the species of a Markush group do not share a single structural similarity or do not share a common use, then a rejection on the basis that the claim contains an “improper Markush grouping” is appropriate. The examiner should maintain the rejection of the claim on the basis that the claim contains an “improper Markush grouping” until the claim is amended to include only the species that share a single structural similarity and a common use, or the applicant presents a sufficient showing that the species in fact share a single structural similarity and a common use.

Under principles of compact prosecution, the examiner should also require the applicant to elect a species or group of indistinct species for search and examination (*i.e.*, an election of species).⁵² If the examiner does not find the species or group of indistinct species in the prior art, then the examiner should extend the search to those additional species that fall within the scope of a permissible Markush claim. In other words, the examiner should extend the search to the species that share a single structural similarity and a common use. The improper Markush claim should be examined for patentability over the prior art with respect to the elected species or group of indistinct species, as well as the species that share a single structural similarity and a common use with the elected species or group of indistinct species (*i.e.*, the species that would fall within the scope of a proper Markush claim). The examiner should also reject the claim under § 112, ¶2 as indefinite if appropriate.

Depending upon the circumstances of an application, it may be appropriate to reject a Markush claim under § 112, ¶2 as indefinite (if one skilled in the art cannot determine the metes and bounds of the Markush claim due to an inability to envision all of the members of the Markush), or under the “improper Markush grouping” doctrine (if the species of a Markush group do not share a single structural similarity or a common use). Alternatively, it may be

appropriate to reject a Markush claim under both § 112, ¶2 and the “improper Markush grouping” doctrine.

5. Dependent Claims: When examining a dependent claim, the examiner should also determine whether the claim complies with § 112, ¶4, which requires that dependent claims contain a reference to a previous claim in the same application, specify a further limitation of the subject matter claimed, and necessarily include all the limitations of the previous claim.⁵³ If the dependent claim does not comply with the requirements of § 112, ¶4, the examiner should reject the dependent claim under § 112, ¶4 as unpatentable rather than objecting to the claim.⁵⁴ Although the requirements of § 112, ¶4 are related to matters of form, non-compliance with § 112, ¶4 renders the claim unpatentable just as non-compliance with other paragraphs of § 112 would.⁵⁵ For example, a dependent claim must be rejected under § 112, ¶4 if it omits an element from the claim upon which it depends⁵⁶ or it fails to add a limitation to the claim upon which it depends.⁵⁷

B. Correspondence Between Specification and Claims: The specification should ideally serve as a glossary to the claim terms so that the examiner and the public can clearly ascertain the meaning of the claim terms. Correspondence between the specification and claims is required by 37 CFR 1.75(d)(1), which provides that claim terms must find clear support or antecedent basis in the specification so that the meaning of the terms may be ascertainable by reference to the specification. To meet the definiteness requirement under § 112, ¶2, the exact claim terms are not required to be used in the specification as long as the specification provides the needed guidance on the meaning of the terms (*e.g.*, by using clearly equivalent terms) so that the meaning of the terms is readily discernable to a person of ordinary skill in the art.⁵⁸ Nevertheless, glossaries of terms used in the claims are a helpful device for ensuring adequate definition of terms used in claims. Express definitions of claim terms can eliminate the need for any “time-consuming and difficult inquiry into indefiniteness.”⁵⁹ Therefore, applicants are encouraged to use glossaries as a best practice in patent application preparation. If the specification does not provide the needed support or antecedent basis for the claim terms, the specification should be objected to under 37 CFR 1.75(d)(1).⁶⁰ Applicant will be required to make appropriate amendment to the description to provide clear support or

antecedent basis for the claim terms provided no new matter is introduced, or amend the claim.

A claim, although clear on its face, may also be indefinite when a conflict or inconsistency between the claimed subject matter and the specification disclosure renders the scope of the claim uncertain.⁶¹ For example, a claim with a limitation of “the clamp means including a clamp body and first and second clamping members, the clamping members being supported by the clamp body” was determined to be indefinite because the terms “first and second clamping members” and “clamp body” were found to be vague in light of the specification which showed no “clamp member” structure being “supported by the clamp body.”⁶² In another example, a claim was directed to a process of treating an aluminum surface with an alkali silicate solution and included a further limitation that the surface has an “opaque” appearance.⁶³ The specification, meanwhile, associated the use of an alkali silicate with a glazed or porcelain-like finish, which the specification distinguished from an opaque finish.⁶⁴ Noting that no claim may be read apart from and independent of the supporting disclosure on which it is based, the court found that the claim was internally inconsistent based on the description, definitions and examples set forth in the specification relating to the appearance of the surface after treatment, and therefore indefinite.⁶⁵

C. Interpreting Claim Limitations Under § 112, ¶6

1. Determining Whether a Claim Limitation Invokes § 112, ¶6: If a claim limitation recites a term and associated functional language, the examiner should determine whether the claim limitation invokes § 112, ¶6. The claim limitation is presumed to invoke § 112, ¶6 when it explicitly uses the phrase “means for” or “step for” and includes functional language. That presumption is overcome when the limitation further includes the structure necessary to perform the recited function.⁶⁶

By contrast, a claim limitation that does not use the phrase “means for” or “step for” will trigger the rebuttable presumption that § 112, ¶6 does not apply.⁶⁷ This presumption is a strong one that is not readily overcome.⁶⁸ This strong presumption may be overcome if the claim limitation is shown to use a non-structural term that is “a nonce word or a verbal construct that is not recognized as the name of structure” but is merely a substitute for the term “means for,” associated with functional language.⁶⁹ However, § 112, ¶6 will not

apply if persons of ordinary skill in the art reading the specification understand the term to be the name for the structure that performs the function, even when the term covers a broad class of structures or identifies the structures by their function (e.g., “filters,” “brakes,” “clamp,” “screwdriver,” and “locks”).⁷⁰ The term is not required to denote a specific structure or a precise physical structure to avoid the application of § 112, ¶6.⁷¹

When the claim limitation does not use the phrase “means for” or “step for,” examiners should determine whether the claim limitation uses a non-structural term (a term that is simply a substitute for the term “means for”). Examiners will apply § 112, ¶6 to a claim limitation that uses a non-structural term associated with functional language, unless the non-structural term is (1) preceded by a structural modifier, defined in the specification as a particular structure or known by one skilled in the art, that denotes the type of structural device (e.g., “filters”), or (2) modified by sufficient structure or material for achieving the claimed function. The following is a list of non-structural terms that may invoke § 112, ¶6: “mechanism for,” “module for,” “device for,” “unit for,” “component for,” “element for,” “member for,” “apparatus for,” “machine for,” or “system for.”⁷² This list is not exhaustive, and other non-structural terms may invoke § 112, ¶6. The following are examples of structural terms that have been found not to invoke § 112, ¶6: “circuit for,”⁷³ “detent mechanism,”⁷⁴ “digital detector for,”⁷⁵ “reciprocating member,”⁷⁶ “connector assembly,”⁷⁷ “perforation,”⁷⁸ “sealingly connected joints,”⁷⁹ and “eyeglass hanger member.”⁸⁰

A limitation will not invoke § 112, ¶6 if there is a structural modifier that further describes the non-structural term. For example, although a non-structural term like “mechanism” standing alone may invoke § 112, ¶6 when coupled with a function, it will not invoke § 112, ¶6 when it is preceded by a structural modifier (e.g., “detent mechanism”).⁸¹ By contrast, when a non-structural term is preceded by a non-structural modifier that does not have any generally understood structural meaning in the art, the phrase may invoke § 112, ¶6 when coupled with a function (e.g., “colorant selection mechanism,” “lever moving element,” or “movable link member”).⁸²

To determine whether a word, term, or phrase coupled with a function denotes structure, examiners should check whether: (1) The specification

provides a description sufficient to inform one of ordinary skill in the art that the term denotes structure; (2) general and subject matter specific dictionaries provide evidence that the term has achieved recognition as a noun denoting structure; and (3) the prior art provides evidence that the term has an art-recognized structure to perform the claimed function.⁸³

Examiners will apply § 112, ¶ 6 to a claim limitation that meets the following conditions: (1) The claim limitation uses the phrase “means for” or “step for” or a **non-structural term** that does not have a structural modifier; (2) the phrase “means for” or “step for” or the non-structural term recited in the claim is modified by functional language; and (3) the phrase “means for” or “step for” or the non-structural term recited in the claim is not modified by sufficient structure, material, or acts for achieving the specified function.

This guideline modifies the 3-prong analysis in MPEP § 2181, which will be revised in due course.

When it is unclear whether a claim limitation invokes § 112, ¶ 6 or not, a rejection under § 112, ¶ 2 may be appropriate.⁸⁴ Similarly, when applicant uses the phrase “means for” or “step for” in the preamble, a rejection under § 112, ¶ 2 may be appropriate when it is unclear whether the preamble is reciting a means (or step) plus function limitation or whether the preamble is merely stating the intended use of the claimed invention. If applicant uses a structural or non-structural term with the word “for” in the preamble, the examiner should not construe such phrase as reciting a means-plus-function limitation.

2. Rejections Under § 112, ¶2 When Examining Means-Plus-Function Limitations Under § 112, ¶6: Once the examiner determines that a claim limitation is a means-plus-function limitation invoking § 112, ¶ 6, the examiner should determine the claimed function⁸⁵ and then review the written description of the specification to determine whether the corresponding structure, material, or acts that perform the claimed function are disclosed.⁸⁶ The disclosure must be reviewed from the point of view of one skilled in the relevant art to determine whether that person would understand the written description to disclose the corresponding structure, material, or acts.⁸⁷ To satisfy the definiteness requirement under § 112, ¶ 2, the written description must clearly link or associate the corresponding structure, material, or acts to the claimed function.⁸⁸ A rejection under § 112, ¶ 2 is appropriate if the written description

fails to link or associate the disclosed structure, material, or acts to the claimed function, or if there is no disclosure (or insufficient disclosure) of structure, material, or acts for performing the claimed function.⁸⁹ A bare statement that known techniques or methods can be used would not be a sufficient disclosure to support a means-plus-function limitation.⁹⁰

A rejection under § 112, ¶ 2 may be appropriate in the following situations when examining means-plus-function claim limitations under § 112, ¶ 6: (1) When it is unclear whether a claim limitation invokes § 112, ¶ 6; (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; and/or (3) when § 112, ¶ 6 is invoked and the supporting disclosure fails to clearly link or associate the disclosed structure, material, or acts to the claimed function.⁹¹ When the examiner cannot identify the corresponding structure, material, or acts, a rejection under § 112, ¶ 2 should be made. In some cases, a requirement for information under 37 CFR 1.105 may be made to require the identification of the corresponding structure, material, or acts.⁹² If a requirement for information under 37 CFR 1.105 is made and the applicant states that he or she lacks such information or the reply does not identify the corresponding structure, material, or acts, a rejection under § 112, ¶ 2 should be made.⁹³

If the written description sets forth the corresponding structure, material, or acts in compliance with § 112, ¶ 2, the claim limitation must “be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.”⁹⁴ However, functional limitations that are not recited in the claim, or structural limitations from the written description that are unnecessary to perform the claimed function, cannot be imported into the claim.⁹⁵

3. Computer-Implemented Means-Plus-Function Limitations: For a computer-implemented means-plus-function claim limitation invoking § 112, ¶ 6, the corresponding structure is required to be more than simply a general purpose computer or microprocessor.⁹⁶ To claim a means for performing a particular computer-implemented function and then to disclose only a general purpose computer as the structure designed to perform that function amounts to pure functional claiming.⁹⁷

The structure corresponding to a § 112, ¶ 6 claim limitation for a computer-implemented function must

include the algorithm needed to transform the general purpose computer or microprocessor disclosed in the specification.⁹⁸ The corresponding structure is not simply a general purpose computer by itself but the special purpose computer as programmed to perform the disclosed algorithm.⁹⁹ Thus, the specification must sufficiently disclose an algorithm to transform a general purpose microprocessor to the special purpose computer.¹⁰⁰ An algorithm is defined, for example, as “a finite sequence of steps for solving a logical or mathematical problem or performing a task.”¹⁰¹ Applicant may express the algorithm in any understandable terms including as a mathematical formula, in prose, in a flow chart, or “in any other manner that provides sufficient structure.”¹⁰²

A rejection under § 112, ¶ 2 is appropriate if the specification discloses no corresponding algorithm associated with a computer or microprocessor.¹⁰³ For example, mere reference to a general purpose computer with appropriate programming without providing an explanation of the appropriate programming,¹⁰⁴ or simply reciting “software” without providing detail about the means to accomplish the software function,¹⁰⁵ would not be an adequate disclosure of the corresponding structure to satisfy the requirements of § 112, ¶ 2. In addition, merely referencing a specialized computer (e.g., a “bank computer”), some undefined component of a computer system (e.g., “access control manager”), “logic,” “code,” or elements that are essentially a black box designed to perform the recited function, will not be sufficient because there must be some explanation of how the computer or the computer component performs the claimed function.¹⁰⁶

In several Federal Circuit cases, the patentees argued that the requirement for the disclosure of an algorithm can be avoided if one of ordinary skill in the art is capable of writing the software to convert a general purpose computer to a special purpose computer to perform the claimed function.¹⁰⁷ Such argument was found to be unpersuasive because the understanding of one skilled in the art does not relieve the patentee of the duty to disclose sufficient structure to support means-plus-function claim terms.¹⁰⁸ The specification must explicitly disclose the algorithm for performing the claimed function, and simply reciting the claimed function in the specification will not be a sufficient disclosure for an algorithm which, by definition, must contain a sequence of steps.¹⁰⁹

If the specification explicitly discloses an algorithm, the sufficiency of the disclosure of the algorithm must be determined in light of the level of ordinary skill in the art.¹¹⁰ The examiner should determine whether one skilled in the art would know how to program the computer to perform the necessary steps described in the specification (*i.e.*, the invention is enabled), and that the inventor was in possession of the invention (*i.e.*, the invention meets the written description requirement). Thus, the specification must sufficiently disclose an algorithm to transform a general purpose microprocessor to a special purpose computer so that a person of ordinary skill in the art can implement the disclosed algorithm to achieve the claimed function.¹¹¹

Often the supporting disclosure for a computer-implemented invention discusses the implementation of the functionality of the invention through hardware, software, or a combination of both. In this situation, a question can arise as to which mode of implementation supports the means-plus-function limitation. The language of § 112, ¶ 6 requires that the recited “means” for performing the specified function shall be construed to cover the corresponding “structure or material” described in the specification and equivalents thereof. Therefore, by choosing to use a means-plus-function limitation and invoke § 112, ¶ 6, applicant limits that claim limitation to the disclosed structure, *i.e.*, implementation by hardware or the combination of hardware and software, and equivalents thereof. Therefore, the examiner should not construe the limitation as covering pure software implementation.

However, if there is no corresponding structure disclosed in the specification (*i.e.*, the limitation is only supported by software and does not correspond to an algorithm **and** the computer or microprocessor programmed with the algorithm), the limitation should be deemed indefinite as discussed above, and the claim should be rejected under § 112, ¶ 2. It is important to remember that claims must be interpreted as a whole; so, a claim that includes a means-plus-function limitation that corresponds to software *per se* (and is thus indefinite for lacking structural support in the specification) is not necessarily directed as a whole to software *per se* unless the claim lacks other structural limitations.

IV. Step 3—Resolving Indefinite Claim Language

A. Examiner Must Establish a Clear Record: Examiners are urged to carefully carry out their responsibilities to see that the application file contains a complete and accurate picture of the Office's consideration of the patentability of an application.¹¹² In order to provide a complete application file history and to enhance the clarity of the prosecution history record, an examiner should provide clear explanations of all actions taken during prosecution of the application.¹¹³ Thus, when a rejection under § 112, ¶ 2, is appropriate based on the examiner's determination that a claim term or phrase is indefinite, the examiner should clearly communicate in an Office action any findings and reasons which support the rejection and avoid a mere conclusion that the claim term or phrase is indefinite.¹¹⁴

MPEP § 2173.05 provides numerous examples of rationales that may support a rejection under § 112, ¶ 2, such as functional claim limitations, relative terminology/terms of degree, lack of antecedent basis, etc. (See PART 1, section III above for detailed guidance on certain situations in determining whether claim language is definite.) Only by providing a complete explanation in the Office action as to the basis for determining why a particular term or phrase used in the claim is “vague and indefinite” will the examiner enhance the clarity of the prosecution history record.¹¹⁵

B. An Office Action Should Provide a Sufficient Explanation: The Office action must set forth the specific term or phrase that is indefinite and why the metes and bounds are unclear. Since a rejection requires the applicant to respond by explaining why claim language is definite or by amending the claim, the Office action should provide enough information for the applicant to prepare a meaningful response. “Because claims delineate the patentee’s right to exclude, the patent statute requires that the scope of the claims be sufficiently definite to inform the public of the bounds of the protected invention, *i.e.*, what subject matter is covered by the exclusive rights of the patent.”¹¹⁶ Thus, claims are given their broadest reasonable interpretation during prosecution “to facilitate sharpening and clarifying the claims at the application stage” when claims are readily changed.¹¹⁷

To comply with § 112, ¶ 2, applicants are required to make the terms that are used to define the invention clear and precise, so that the metes and bounds of

the subject matter that will be protected by the patent grant can be ascertained.¹¹⁸ It is important that a person of ordinary skill in the art be able to interpret the metes and bounds of the claims so as to understand how to avoid infringement of the patent that ultimately issues from the application being examined.¹¹⁹ Examiners should bear in mind that “[a]n essential purpose of patent examination is to fashion claims that are precise, clear, correct, and unambiguous. Only in this way can uncertainties of claim scope be removed, as much as possible, during the administrative process.”¹²⁰

Accordingly, when rejecting a claim as indefinite under § 112, ¶ 2, the examiner should provide enough information in the Office action to permit applicant to make a meaningful response, as the indefiniteness rejection requires the applicant to explain or provide evidence as to why the claim language is not indefinite or amend the claim. For example, the examiner should point out the specific term or phrase that is indefinite, explain in detail why such term or phrase renders the metes and bounds of the claim scope unclear and, whenever practicable, indicate how the indefiniteness issues may be resolved to overcome the rejection.¹²¹

The focus during the examination of claims for compliance with the requirement for definiteness under § 112, ¶ 2, is whether the claim meets the threshold requirements of clarity and precision, not whether more suitable language or modes of expression are available. See MPEP § 2173.02. If the language used by applicant satisfies the statutory requirement of § 112, ¶ 2, but the examiner merely wants the applicant to improve the clarity or precision of the language used, the examiner should suggest improved claim language to the applicant and not make a rejection under § 112, ¶ 2.¹²² Furthermore, when the examiner determines that more information is necessary to ascertain the meaning of a claim term, a requirement for information under 37 CFR 1.105 is appropriate. See MPEP § 704.10 regarding requirements for information.

It is highly desirable to have applicants resolve ambiguity by amending the claims during prosecution of the application rather than attempting to resolve the ambiguity in subsequent litigation of the issued patent.¹²³ Likewise, if the applicant traverses a rejection under § 112, ¶ 2, with or without the submission of an amendment, and the examiner considers applicant's arguments to be persuasive, the examiner should indicate in the next

Office communication that the previous rejection under § 112, ¶ 2, has been withdrawn and provide an explanation as to what prompted the change in the examiner's position (*e.g.*, by making specific reference to portions of applicant's remarks).¹²⁴

C. Practice Compact Prosecution

1. Interpret the Claim and Apply Art With an Explanation of How an Indefinite Term Is Interpreted: The goal of examination is to clearly articulate any rejection early in the prosecution process so that the applicant has the chance to provide evidence of patentability and otherwise reply completely at the earliest opportunity.¹²⁵ Under the principles of compact prosecution, the examiner should review each claim for compliance with every statutory requirement for patentability in the initial review of the application and identify all of the applicable grounds of rejection in the first Office action to avoid unnecessary delays in the prosecution of the application.¹²⁶

Thus, when the examiner determines that a claim term or phrase renders the claim indefinite, the examiner should make a rejection based on indefiniteness under § 112, ¶ 2, as well as a rejection(s) in view of the prior art under § 102 or § 103 that renders the prior art applicable based on the examiner's interpretation of the claim. When making a rejection over prior art in these circumstances, it is important that the examiner state on the record how the claim term or phrase is being interpreted with respect to the prior art applied in the rejection. By rejecting each claim on all reasonable grounds available, the examiner can avoid piecemeal examination.¹²⁷

2. Open Lines of Communication With the Applicant—When Indefiniteness Is the Only Issue, Attempt Resolution Through an Interview Before Resorting to a Rejection: Examiners are reminded that interviews can be an effective examination tool and are encouraged to initiate an interview with the applicant or applicant's representative at any point during the pendency of an application, if the interview can help further prosecution, shorten pendency, or provide a benefit to the examiner or applicant.¹²⁸ Issues of claim interpretation and clarity of scope may lend themselves to resolution through an examiner interview. For example, the examiner may initiate an interview to discuss, among other issues, the broadest reasonable interpretation of a claim, the meaning of a particular claim limitation, and the scope and clarity of preamble language, functional language,

intended use language, and means-plus-function limitations, etc.

An interview can serve to develop and clarify such issues and lead to a mutual understanding between the examiner and the applicant, potentially eliminating the need for the examiner to resort to making a rejection under § 112, ¶ 2. The examiner is reminded that the substance of any interview, whether in person, by video conference, or by telephone must be made of record in the application, whether or not an agreement was reached at the interview.¹²⁹ Examples of § 112 issues that should be made of record after the interview include: why the discussed claim term is or is not sufficiently clear; why the discussed claim term is or is not inconsistent with the specification; why the discussed claim term does or does not invoke § 112, ¶ 6, (and if it does, the identification of corresponding structure in the specification for a § 112, ¶ 6 limitation); and any claim amendments discussed that would resolve identified ambiguities.

D. Ensure That the Record Is Clear

1. Provide Claim Interpretation in Reasons for Allowance When Record Is Unclear: Pursuant to 37 CFR 1.104(e), if the examiner believes that the record of the prosecution as a whole does not make clear his or her reasons for allowing a claim or claims, the examiner may set forth such reasoning in reasons for allowance.¹³⁰ One of the primary purposes of 37 CFR 1.104(e) is to improve the quality and reliability of issued patents by providing a complete file history which should clearly reflect the reasons why the application was allowed. Such information facilitates evaluation of the scope and strength of a patent by the patentee and the public and may help avoid or simplify subsequent litigation of an issued patent.¹³¹ In meeting the need for the application file history to speak for itself, it is incumbent upon the examiner in exercising his or her responsibility to the public, to see that the file history is complete.¹³²

For example, when allowing a claim based on a claim interpretation which might not be readily apparent from the record of the prosecution as a whole, the examiner should set forth in reasons for allowance the claim interpretation that he or she applied in determining that the claim is allowable over the prior art.¹³³ This is especially the case where the application is allowed after an interview. The examiner should ensure, however, that statements of reasons for allowance do not place unwarranted interpretations, whether broad or narrow, upon the claims.¹³⁴

2. Provide Claim Interpretation When § 112, ¶ 6 Is Invoked: The examiner should specify in the Office action that a claim limitation has been interpreted under the provisions of § 112, ¶ 6, as provided above in section III.C. When claim terms other than “means for” or “step for” are determined to invoke § 112, ¶ 6 pursuant to the guidance above, the reasons why the claim was interpreted as invoking 112, ¶ 6, should also be clearly stated in the Office action. For example, the Office action can include a statement that a certain claim limitation is expressed in functional terms coupled to a non-structural word (e.g., “module for,”) that does not connote structure and therefore invokes treatment under § 112, ¶ 6. When the examiner has determined that § 112, ¶ 6 applies, the examiner may also specify what the specification identifies as the corresponding structure.

Additionally, if the corresponding structure for the claimed function is not clearly identifiable in the specification, the Office action should, nevertheless, attempt to identify what structure is most closely associated with the means-plus-function limitation to facilitate a prior art search. This is especially true when there may be confusion as to which disclosed implementation of the invention supports the limitation, as explained in section III.C.3 above.

When allowing a claim that was treated under § 112, ¶ 6, the examiner should indicate that the claim was interpreted under the provisions of § 112, ¶ 6 in reasons for allowance if such an explanation has not previously been made of record. As noted above, the indication should also clarify the associated structure if not readily apparent in the specification.

Part 2: Supplemental Information for Examining Computer-Implemented Functional Claim Limitations

The statutory requirements for computer-implemented inventions are the same as for all inventions, such as the subject matter eligibility¹³⁵ and utility¹³⁶ requirements under § 101, the definiteness requirement of § 112, ¶ 2, the three separate and distinct requirements of § 112, ¶ 1,¹³⁷ the novelty requirement of § 102, and nonobviousness requirement of § 103.¹³⁸ Nevertheless, computer-implemented inventions have certain unique examination issues, especially those that are claimed using functional language that is not limited to a specific structure. This section provides supplemental information to assist examiners in examining computer-implemented functional claim

limitations. See PART 1, sections III.C. and IV.D. (above) for information regarding means (or step) plus function limitations that invoke § 112, ¶ 6.

I. Determining Whether There Is Adequate Written Description for a Computer-Implemented Functional Claim Limitation: The first paragraph of § 112 contains a written description requirement that is separate and distinct from the enablement requirement.¹³⁹ To satisfy the written description requirement, the specification must describe the claimed invention in sufficient detail that one skilled in the art can reasonably conclude that the inventor had possession of the claimed invention.¹⁴⁰ Specifically, the specification must describe the claimed invention in a manner understandable to a person of ordinary skill in the art and show that the inventor actually invented the claimed invention.¹⁴¹

The written description requirement of § 112, ¶ 1 applies to all claims including original claims that are part of the disclosure as filed.¹⁴² As stated by the Federal Circuit, “[a]lthough many original claims will satisfy the written description requirement, certain claims may not.”¹⁴³ For instance, generic claim language in the original disclosure does not satisfy the written description requirement if it fails to support the scope of the genus claimed.¹⁴⁴ For example, in *LizardTech*, the claim was directed to a method of compressing digital images using seamless discrete wave transformation (“DWT”). The court found that the claim covered all ways of performing DWT-based compression processes that lead to a seamless DWT because there were no limitations as to how the seamless DWT was to be accomplished.¹⁴⁵ However, the specification provided only one method for creating a seamless DWT, and there was no evidence that the specification contemplated a more generic way of creating a seamless array of DWT coefficients. Therefore, the written description requirement was not satisfied in this case because the specification did not provide sufficient evidence that the inventor invented the generic claim.¹⁴⁶

In addition, original 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.¹⁴⁷ In *Ariad*, the court recognized the problem of using functional claim language without providing in the specification examples of species that achieve the claimed function:¹⁴⁸

The problem is especially acute with genus claims that use functional language to define the boundaries of a claimed genus. In such a case, the functional claim may simply claim a desired result, and may do so without describing species that achieve that result. But the specification must demonstrate that the applicant has made a generic invention that achieves the claimed result and do so by showing that the applicant has invented species sufficient to support a claim to the functionally-defined genus.¹⁴⁸

The level of detail required to satisfy the written description requirement varies depending on the nature and scope of the claims and on the complexity and predictability of the relevant technology.¹⁴⁹ Computer-implemented inventions are often disclosed and claimed in terms of their functionality. This is because writing computer programming code for software to perform specific functions is normally within the skill of the art once those functions have been adequately disclosed.¹⁵⁰ Nevertheless, for computer-implemented inventions, the determination of the sufficiency of disclosure will require an inquiry into both the sufficiency of the disclosed hardware as well as the disclosed software due to the interrelationship and interdependence of computer hardware and software.¹⁵¹ For instance, in *In re Hayes Microcomputer Products*, the written description requirement was satisfied because the specification disclosed the specific type of microcomputer used in the claimed invention as well as the necessary steps for implementing the claimed function. The disclosure was in sufficient detail such that one skilled in the art would know how to program the microprocessor to perform the necessary steps described in the specification.¹⁵² Two additional observations made by the Federal Circuit in *Hayes* are important. First, the Federal Circuit stressed that the written description requirement was satisfied because the particular steps, *i.e.*, algorithm, necessary to perform the claimed function were “described in the specification.”¹⁵³ Second, the Court acknowledged that the level of detail required for the written description requirement to be met is case specific.¹⁵⁴

When examining computer-implemented functional claims, examiners should determine whether the specification discloses the computer and the algorithm (*e.g.*, the necessary steps and/or flowcharts) that perform the claimed function in sufficient detail such that one of ordinary skill in the art can reasonably conclude that the inventor invented the claimed subject

matter. Specifically, if one skilled in the art would know how to program the disclosed computer to perform the necessary steps described in the specification to achieve the claimed function and the inventor was in possession of that knowledge, the written description requirement would be satisfied.¹⁵⁵ If the specification does not provide a disclosure of the computer and algorithm in sufficient detail to demonstrate to one of ordinary skill in the art that the inventor possessed the invention including how to program the disclosed computer to perform the claimed function, a rejection under § 112, ¶ 1 for lack of written description must be made. For more information regarding the written description requirement, see MPEP § 2161.01–2163.07(b).

II. Determining Whether the Full Scope of a Computer-Implemented Functional Claim Limitation Is Enabled: To satisfy the enablement requirement of § 112, ¶ 1, the specification must teach those skilled in the art how to make and use the full scope of the claimed invention without “undue experimentation.”¹⁵⁶ In *In re Wands*, the court set forth the following factors to consider when determining whether undue experimentation is needed: (1) The breadth of the claims; (2) the nature of the invention; (3) the state of the prior art; (4) the level of one of ordinary skill; (5) the level of predictability in the art; (6) the amount of direction provided by the inventor; (7) the existence of working examples; and (8) the quantity of experimentation needed to make or use the invention based on the content of the disclosure.¹⁵⁷ The undue experimentation determination is not a single factual determination. Rather, it is a conclusion reached by weighing all the factual considerations.¹⁵⁸

Functional claim language may render the claims broad when the claim is not limited to any particular structure for performing the claimed function.¹⁵⁹ Since such a claim covers all devices which perform the recited function, there is a concern regarding whether the scope of enablement provided to one skilled in the art by the disclosure is commensurate with the scope of protection sought by the claim.¹⁶⁰ Applicants who present broad claim language must ensure the claims are fully enabled. Specifically, the scope of the claims must be less than or equal to the scope of the enablement provided by the specification.¹⁶¹

For example, the claims in *Sitrick* were directed to “integrating” or “substituting” a user’s audio signal or visual image into a pre-existing video game or movie. While the claims

covered both video games and movies, the specification only taught the skilled artisan how to substitute and integrate user images into video games. The Federal Circuit held that the specification failed to enable the full scope of the claims because the skilled artisan could not substitute a user image for a preexisting character image in movies without undue experimentation. Specifically, the court recognized that one skilled in the art could not apply the teachings of the specification regarding video games to movies, because movies, unlike video games, do not have easily separable character functions. Because the specification did not teach how the substitution and integration of character functions for a user image would be accomplished in movies, the claims were not enabled.¹⁶²

Although the specification need not teach what is well known in the art, applicant cannot rely on the knowledge of one skilled in the art to supply information that is required to enable the novel aspect of the claimed invention, when the enabling knowledge is in fact not known in the art.¹⁶³ The Federal Circuit has stated that “[i]t is the specification, not the knowledge of one skilled in the art, that must supply the novel aspects of an invention in order to constitute adequate enablement.”¹⁶⁴ The rule that a specification need not disclose what is well known in the art is “merely a rule of supplementation, not a substitute for a basic enabling disclosure.”¹⁶⁵ Therefore, the specification must contain the information necessary to enable the novel aspects of the claimed invention.¹⁶⁶ For instance, in *Auto. Techs.*, the claim limitation “means responsive to the motion of said mass” was construed to include both mechanical side impact sensors and electronic side impact sensors for performing the function of initiating an occupant protection apparatus.¹⁶⁷ The specification did not disclose any discussion of the details or circuitry involved in the electronic side impact sensor, and thus, it failed to apprise one of ordinary skill how to make and use the electronic sensor. Since the novel aspect of the invention was side impact sensors, the patentee could not rely on the knowledge of one skilled in the art to supply the missing information.¹⁶⁸

A rejection under § 112, ¶ 1 for lack of enablement must be made when the specification does not enable the full scope of the claim. USPTO personnel should establish a reasonable basis to question the enablement provided for the claimed invention and provide reasons for the uncertainty of the enablement. For more information

regarding the enablement requirement, see MPEP §§ 2161.01, 2164.01(a)–2164.08(c), e.g., 2164.06(c) on examples of computer programming cases.

III. Determining Whether a Computer-Implemented Functional Claim Limitation Is Patentable Over the Prior Art Under §§ 102 and 103: Functional claim language that is not limited to a specific structure covers all devices that are capable of performing the recited function. Therefore, if the prior art discloses a device that can inherently perform the claimed function, a rejection under § 102 or 103 may be appropriate.¹⁶⁹ See MPEP §§ 2112 and 2114 for more information.

Computer-implemented functional claim limitations may also be broad because the term “computer” is commonly understood by one of ordinary skill in the art to describe a variety of devices with varying degrees of complexity and capabilities.¹⁷⁰ Therefore, a claim containing the term “computer” should not be construed as limited to a computer having a specific set of characteristics and capabilities, unless the term is modified by other claim terms or clearly defined in the specification to be different from its common meaning.¹⁷¹ In *In re Paulsen*, the claims, directed to a portable computer, were rejected as anticipated under § 102 by a reference that disclosed a calculator, because the term “computer” was given the broadest reasonable interpretation consistent with the specification to include a calculator, and a calculator was considered to be a particular type of computer by those of ordinary skill in the art.¹⁷²

When determining whether a computer-implemented functional claim is obvious, examiners should note that broadly claiming an automated means to replace a manual function to accomplish the same result does not distinguish over the prior art.¹⁷³ Furthermore, implementing a known function on a computer has been deemed obvious to one of ordinary skill in the art if the automation of the known function on a general purpose computer is nothing more than the predictable use of prior art elements according to their established functions.¹⁷⁴ Likewise, it has been found to be obvious to adapt an existing process to incorporate Internet and Web browser technologies for communicating and displaying information because these technologies had become commonplace for those functions.¹⁷⁵

For more information on the obviousness determination, see MPEP § 2141 and *Examination Guidelines Update: Developments in the*

Obviousness Inquiry after KSR v. Teleflex, 75 FR 53643 (Sept. 1, 2010).

Dated: January 21, 2011.

David J. Kappos,

Under Secretary of Commerce for Intellectual Property and Director of the United States Patent and Trademark Office.

¹ *In re Yamamoto*, 740 F.2d 1569, 1571 (Fed. Cir. 1984); *In re Zletz*, 893 F.2d 319, 321 (Fed. Cir. 1989) (“During patent examination the pending claims must be interpreted as broadly as their terms reasonably allow.”).

² *In re Suitco Surface, Inc.*, 603 F.3d 1255, 1260 (Fed. Cir. 2010); *In re Buszard*, 504 F.3d 1364 (Fed. Cir. 2007). In *Buszard*, the claim was directed to a flame retardant composition comprising a flexible polyurethane foam reaction mixture. *Id.* at 1365. The Federal Circuit found that the Board’s interpretation that equated a “flexible” foam with a crushed “rigid” foam was not reasonable. *Id.* at 1367. Persuasive argument was presented that persons experienced in the field of polyurethane foams know that a flexible mixture is different than a rigid foam mixture. *Id.* at 1366.

³ *In re Morris*, 127 F.3d 1048, 1054 (Fed. Cir. 1997) (the USPTO looks to the ordinary use of the claim terms taking into account definitions or other “enlightenment” contained in the written description); *But c.f. In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1369 (Fed. Cir. 2004) (“We have cautioned against reading limitations into a claim from the preferred embodiment described in the specification, even if it is the only embodiment described, absent clear disclaimer in the specification.”).

⁴ See, e.g., *Exxon Research and Eng’g Co. v. United States*, 265 F.3d 1371, 1375 (Fed. Cir. 2001).

⁵ *Morris*, 127 F.3d at 1054; *Zletz*, 893 F.2d at 321–322.

⁶ *Ex parte Miyazaki*, 89 USPQ2d 1207, 1212 (Bd. Pat. App. & Int. 2008) (precedential); *In re Am. Acad. of Sci. Tech Center*, 367 F.3d 1359, 1369 (Fed. Cir. 2004) (“However, the Board is required to use a different standard for construing claims than that used by district courts.”).

⁷ *Burlington Indus. Inc. v. Quigg*, 822 F.2d 1581, 1583 (Fed. Cir. 1987) (“Issues of judicial claim construction such as arise after patent issuance, for example during infringement litigation, have no place in prosecution of pending claims before the PTO, when any ambiguity or excessive breadth may be corrected by merely changing the claim.”) (emphasis added).

⁸ *Zletz*, 893 F.2d at 322.

⁹ See Memorandum entitled “*Indefiniteness rejections under 35 U.S.C. 112, second paragraph*” available at http://www.uspto.gov/web/offices/pac/dapp/opla/preognocite/section_112_6th_09_02_2008.pdf.

¹⁰ 35 U.S.C. 112, ¶ 6; see also *In re Donaldson Co.*, 16 F.3d 1189, 1193 (Fed. Cir. 1994) (en banc) (“[W]e hold that paragraph six applies regardless of the context in which the interpretation of means-plus-function language arises, i.e., whether as part of a patentability determination in the PTO or as

part of a validity or infringement determination in a court.”).

¹¹ See, e.g., *Johnson & Johnston Assoc. Inc. v. R.E. Serv. Co.*, 285 F.3d 1046, 1052 (Fed. Cir. 2002).

¹² *Halliburton Energy Servs., Inc. v. M-I LLC*, 514 F.3d 1244, 1255 (Fed. Cir. 2008) (emphasis added).

¹³ *Power-One, Inc. v. Artesyn Techs., Inc.*, 599 F.3d 1343, 1350 (Fed. Cir. 2010); *Orthokinetics, Inc. v. Safety Travel Chairs, Inc.*, 806 F.2d 1565 (Fed. Cir. 1986). In *Orthokinetics*, a claim directed to a wheel chair included the phrase “so dimensioned as to be insertable through the space between the doorframe of an automobile and one of the seats thereof.” *Id.* at 1568. The court found the phrase to be as accurate as the subject matter permits, since automobiles are of various sizes. *Id.* at 1576. “As long as those of ordinary skill in the art realized the dimensions could be easily obtained, § 112, 2d ¶ requires nothing more.” *Id.*

¹⁴ *Medrad, Inc. v. MRI Devices Corp.*, 401 F.3d 1313, 1318 (Fed. Cir. 2005).

¹⁵ *In re Swinehart*, 439 F.2d 210, 212 (CCPA 1971); see also MPEP § 2173.05(g).

¹⁶ *Swinehart*, 439 F.2d at 212; see also *Halliburton Energy Servs.*, 514 F.3d at 1255.

¹⁷ See, e.g., *K-2 Corp. v. Salomon S.A.*, 191 F.3d 1356, 1363 (Fed. Cir. 1999).

¹⁸ *Phillips v. AWH Corp.*, 415 F.3d 1303, 1311 (Fed. Cir. 2005) (en banc) (“Means-plus-function claiming applies only to purely functional limitations that do not provide the structure that performs the recited function.”).

¹⁹ *In re Schreiber*, 128 F.3d 1473, 1478 (Fed. Cir. 1997).

²⁰ *Id.*

²¹ *Swinehart*, 439 F.2d at 213.

²² *Halliburton Energy Servs.*, 514 F.3d at 1255 (noting that the Supreme Court explained that a vice of functional claiming occurs “when the inventor is painstaking when he recites what has already been seen, and then uses conveniently functional language at the exact point of novelty”) (quoting *General Elec. Co. v. Wabash Appliance Corp.*, 304 U.S. 364, 371 (1938)); see also *United Carbon Co. v. Binney & Smith Co.*, 317 U.S. 228, 234 (1942) (holding indefinite claims that recited substantially pure carbon black “in the form of commercially uniform, comparatively small, rounded smooth aggregates having a spongy or porous exterior”).

²³ *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1353 (Fed. Cir. 2010) (en banc).

²⁴ *In re Hyatt*, 708 F.2d 712, 714 (Fed. Cir. 1983).

²⁵ *Ariad*, 598 F.3d at 1340.

²⁶ *Hyatt*, 708 F.2d at 714–715.

²⁷ *Halliburton Energy Servs.*, 514 F.3d at 1255.

²⁸ *Id.* at 1255–56.

²⁹ *General Elec. Co.*, 304 U.S. at 370–71, 375.

³⁰ *Id.* at 370.

³¹ *United Carbon Co.*, 317 U.S. at 234.

³² *Id.* at 233.

³³ *Swinehart*, 439 F.2d at 214.

³⁴ *In re Marosi*, 710 F.2d 799, 803 (Fed. Cir. 1983).

³⁵ *Halliburton Energy Servs.*, 514 F.3d at 1255–56.

³⁶ *Id.* at 1256 (*citing Oakley, Inc. v. Sunglass Hut Int'l*, 316 F.3d 1331, 1341 (Fed. Cir. 2003)).

³⁷ *Marosi*, 710 F.2d at 803.

³⁸ *Hearing Components, Inc. v. Shure Inc.*, 600 F.3d 1357, 1367 (Fed. Cir. 2010); *Enzo Biochem, Inc., v. Applera Corp.*, 599 F.3d 1325, 1332 (Fed. Cir. 2010); *Seattle Box Co., Inc. v. Indus. Crating & Packing, Inc.*, 731 F.2d 818, 826 (Fed. Cir. 1984).

³⁹ See MPEP § 2173.05(b).

⁴⁰ See, e.g., *Young v. Lumenis, Inc.*, 492 F.3d 1336, 1346 (Fed. Cir. 2007); *Exxon Research*, 265 F.3d at 1381.

⁴¹ *Enzo Biochem*, 599 F.3d at 1335 (noting that applicant overcame an indefiniteness rejection over “not interfering substantially” claim language by submitting a declaration under 37 CFR 1.132 listing eight specific linkage groups that applicant declared did not substantially interfere with hybridization or detection).

⁴² *In re Musgrave*, 431 F.2d 882, 893 (CCPA 1970).

⁴³ *Datamize, LLC v. Plumtree Software, Inc.*, 417 F.3d 1342, 1350 (Fed. Cir. 2005).

⁴⁴ *Id.* at 1344–45.

⁴⁵ *Id.* at 1352.

⁴⁶ *Id.* at 1350.

⁴⁷ *In re Harnisch*, 631 F.2d 716, 719–20 (CCPA 1980); *Ex parte Markush*, 1925 Dec. Comm'r Pat. 126, 127 (1924).

⁴⁸ *In re Gardner*, 427 F.2d 786, 788 (CCPA 1970) (“Breadth is not indefiniteness.”).

⁴⁹ *Harnisch*, 631 F.2d at 721.

⁵⁰ *Id.* at 722.

⁵¹ See MPEP § 803.02.

⁵² See *id.* for more information on election of species.

⁵³ 35 U.S.C. 112, ¶4 (“Subject to the following paragraph, a claim in dependent form shall contain a reference to a claim previously set forth and then specify a further limitation of the subject matter claimed. A claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers.”).

⁵⁴ *Pfizer, Inc. v. Ranbaxy Labs., Ltd.*, 457 F.3d 1284, 1291–92 (Fed. Cir. 2006) (holding a dependent claim in a patent invalid for failure to comply with § 112, ¶4).

⁵⁵ *Id.*

⁵⁶ *Id.*

⁵⁷ *Curtiss-Wright Flow Control Corp. v. Velan, Inc.*, 438 F.3d 1374, 1380 (Fed. Cir. 2006) (stating that “reading an additional limitation from a dependent claim into an independent claim would not only make that additional limitation superfluous, it might render the dependent claim invalid” for failing to add a limitation to the claim upon which it depends, as required by § 112, ¶4).

⁵⁸ See, e.g., *Bancorp Servs., L.L.C. v. Hartford Life Ins. Co.*, 359 F.3d 1367, 1373 (Fed. Cir. 2004).

⁵⁹ *Id.*

⁶⁰ See MPEP §§ 608.01(o) and 2181.

⁶¹ *In re Cohn*, 438 F.2d 989, 993 (CCPA 1971); *In re Moore*, 439 F.2d 1232, 1235–36 (CCPA 1971); MPEP § 2173.03.

⁶² *In re Anderson*, 1997 U.S. App. Lexis 167 (Fed. Cir. Jan. 6, 1997) (unpublished).

⁶³ *Cohn*, 438 F.2d at 993.

⁶⁴ *Id.*

⁶⁵ *Id.*

⁶⁶ *TriMed, Inc. v. Stryker Corp.*, 514 F.3d 1256, 1259–60 (Fed. Cir. 2008) (“Sufficient

structure exists when the claim language specifies the exact structure that performs the function in question without need to resort to other portions of the specification or extrinsic evidence for an adequate understanding of the structure.”); see also *Altiris, Inc. v. Symantec Corp.*, 318 F.3d 1363, 1376 (Fed. Cir. 2003).

⁶⁷ See, e.g., *Phillips*, 415 F.3d at 1311; *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1369 (Fed. Cir. 2002); *Personalized Media Commc'ns, LLC v. ITC*, 161 F.3d 696, 703–04 (Fed. Cir. 1998).

⁶⁸ *Lighting World, Inc. v. Birchwood Lighting, Inc.*, 382 F.3d 1354, 1358 (2004).

⁶⁹ *Id.* at 1360.

⁷⁰ *Id.; Apex Inc. v. Raritan Computer, Inc.*, 325 F.3d 1364, 1372–73 (Fed. Cir. 2003); *CCS Fitness*, 288 F.3d at 1369; *Watts v. XL Sys. Inc.*, 232 F.3d 877, 800 (Fed. Cir. 2000); *Personalized Media*, 161 F.3d at 704; *Greenberg v. Ethicon Endo-Surgery, Inc.*, 91 F.3d 1580, 1583 (Fed. Cir. 1996) (“Many devices take their names from the functions they perform.”).

⁷¹ *Watts*, 232 F.3d at 800.

⁷² *Welker Bearing Co., v. PHD, Inc.*, 550 F.3d 1090, 1096 (Fed. Cir. 2008); *Massachusetts Inst. of Tech. v. Abacus Software*, 462 F.3d 1344, 1354 (Fed. Cir. 2006); *Personalized Media*, 161 F.3d at 704; *Mas-Hamilton Group v. LaGard, Inc.*, 156 F.3d 1206, 1214–1215 (Fed. Cir. 1998).

⁷³ *Linear Tech. Corp. v. Impala Linear Corp.*, 379 F.3d 1311, 1321 (Fed. Cir. 2004); *Apex*, 325 F.3d at 1373.

⁷⁴ *Greenberg*, 91 F.3d at 1583–84.

⁷⁵ *Personalized Media*, 161 F.3d at 704–05.

⁷⁶ *CCS Fitness*, 288 F.3d at 1369–70.

⁷⁷ *Lighting World*, 382 F.3d at 1358–63.

⁷⁸ *Cole v. Kimberly-Clark Corp.*, 102 F.3d 524, 531 (Fed. Cir. 1996).

⁷⁹ *Watts*, 232 F.3d at 881.

⁸⁰ *Al-Site Corp. v. VSI Int'l, Inc.*, 174 F.3d 1308, 1318–19 (Fed. Cir. 1999).

⁸¹ *Greenberg*, 91 F.3d at 1583 (holding that the term “detent mechanism” did not to invoke § 112, ¶6 because the structural modifier “detent” denotes a type of structural device with a generally understood meaning in the mechanical arts).

⁸² *Massachusetts Inst. of Tech.*, 462 F.3d at 1354; *Mas-Hamilton*, 156 F.3d at 1214–1215.

⁸³ *Ex parte Rodriguez*, 92 USPQ2d 1395, 1404 (Bd. Pat. App. & Int. 2009) (precedential).

⁸⁴ See Memorandum entitled “Rejections under 35 U.S.C. 112, second paragraph, when examining means (or step) plus function claim limitations under 35 U.S.C. 112, sixth paragraph” available at http://www.uspto.gov/web/offices/pac/dapp/opla/preognotice/section_112_6th_09_02_2008.pdf.

⁸⁵ The claimed function may include the functional language that precedes the phrase “means for.” *Baran v. Medical Device Techs., Inc.*, No. 2010–1058, slip op. at 12–13 (Fed. Cir. Aug. 12, 2010).

⁸⁶ Note that drawings may provide a written description of an invention as required by 35 U.S.C. 112. See *Vas-Cath Inc. v. Mahurkar*, 935 F.2d 1555, 1565 (Fed. Cir. 1991). The corresponding structure, material, or acts may be disclosed in the original drawings, figures, tables, or sequence listing.

However, the corresponding structure, material, or acts cannot include any structure, material, or acts disclosed only in the material incorporated by reference or a prior art reference. See *Pressure Prods. Med. Supplies, Inc. v. Greatbatch Ltd.*, 599 F.3d 1308, 1317 (Fed. Cir. 2010); *Atmel Corp. v. Info. Storage Devices, Inc.*, 198 F.3d 1374, 1381 (Fed. Cir. 1999).

⁸⁷ *Tech. Licensing Corp. v. Videotek, Inc.*, 545 F.3d 1316, 1338 (Fed. Cir. 2008); *Med. Instrumentation & Diagnostics Corp. v. Elektro AB*, 344 F.3d 1205, 1211–12 (Fed. Cir. 2003).

⁸⁸ *Telcordia Techs., Inc. v. Cisco Systems, Inc.*, No. 2009–1175, 2009–1184, slip op. at 19 (Fed. Cir. July 6, 2010).

⁸⁹ *Donaldson*, 16 F.3d at 1195.

⁹⁰ *Biomedino, LLC v. Waters Techs. Corp.*, 490 F.3d 946, 953 (Fed. Cir. 2007).

⁹¹ See Memorandum entitled “Rejections under 35 U.S.C. 112, second paragraph, when examining means (or step) plus function claim limitations under 35 U.S.C. 112, sixth paragraph” available at http://www.uspto.gov/web/offices/pac/dapp/opla/preognotice/section_112_6th_09_02_2008.pdf.

⁹² See MPEP § 704.11(a) (Example R).

⁹³ For more information, see MPEP § 704.12 (“Replies to requirements for information must be complete and filed within the time period set including any extensions. Failure to reply within the time period set will result in the abandonment of the application.”)

⁹⁴ 35 U.S.C. 112, ¶6.

⁹⁵ *Welker Bearing*, 550 F.3d at 1097; *Wenger Mfg., Inc. v. Coating Mach. Sys., Inc.*, 239 F.3d 1225, 1233 (Fed. Cir. 2001).

⁹⁶ *Aristocrat Techs. Australia Pty Ltd. v. Int'l Game Tech.*, 521 F.3d 1328, 1333 (Fed. Cir. 2008).

⁹⁷ *Id.*

⁹⁸ *Id.; Finisar Corp. v. DirecTV Group, Inc.*, 523 F.3d 1323, 1340 (Fed. Cir. 2008); *WMS Gaming, Inc. v. Int'l Game Tech.*, 184 F.3d 1339, 1349 (Fed. Cir. 1999).

⁹⁹ *Aristocrat*, 521 F.3d at 1333.

¹⁰⁰ *Id.* at 1338.

¹⁰¹ *Microsoft Computer Dictionary*, Microsoft Press, 5th edition, 2002.

¹⁰² *Finisar*, 523 F.3d at 1340; see also *Intel Corp. v. VIA Techs., Inc.*, 319 F.3d 1357, 1366 (Fed. Cir. 2003); *In re Dossel*, 115 F.3d 942, 946–47 (1997); MPEP § 2181.

¹⁰³ *Aristocrat*, 521 F.3d at 1337–38.

¹⁰⁴ *Id.* at 1334.

¹⁰⁵ *Finisar*, 523 F.3d at 1340–41.

¹⁰⁶ *Blackboard, Inc. v. Desire2Learn, Inc.*, 574 F.3d 1371, 1383–1385 (Fed. Cir. 2009); *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1366–67 (Fed. Cir. 2008); *Rodriguez*, 92 USPQ2d at 1405–06.

¹⁰⁷ See, e.g., *Blackboard*, 574 F.3d at 1385; *Biomedino*, 490 F.3d at 952; *Atmel Corp.*, 198 F.3d at 1380.

¹⁰⁸ *Blackboard*, 574 F.3d at 1385 (“A patentee cannot avoid providing specificity as to structure simply because someone of ordinary skill in the art would be able to devise a means to perform the claimed function.”); *Atmel Corp.*, 198 F.3d at 1380 (“[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.”).

¹⁰⁹ *Blackboard*, 574 F.3d at 1384 (stating that language that simply describes the function to be performed describes an outcome, not a means for achieving that outcome); *Microsoft Computer Dictionary*, Microsoft Press, 5th edition, 2002; *see also Encyclopaedia Britannica, Inc. v. Alpine Elecs., Inc.*, 355 Fed. Appx. 389, 394–95, 2009 U.S. App. Lexis. 26358, 10–16 (Fed. Cir. 2009) (holding that implicit or inherent disclosure of a class of algorithms for performing the claimed functions is not sufficient, and the purported “one-step” algorithm is not an algorithm at all) (unpublished).

¹¹⁰ *Aristocrat*, 521 F.3d at 1337; *AllVoice Computing PLC v. Nuance Commc’ns, Inc.*, 504 F.3d 1236, 1245 (Fed. Cir. 2007); *Intel Corp.*, 319 F.3d at 1366–67 (knowledge of a person of ordinary skill in the art can be used to make clear how to implement a disclosed algorithm).

¹¹¹ *Aristocrat*, 521 F.3d at 1338.

¹¹² See MPEP § 1302.14(I).

¹¹³ See MPEP § 707.07(f).

¹¹⁴ See MPEP § 706.03, 707.07(g).

¹¹⁵ See MPEP § 2173.02.

¹¹⁶ *Halliburton Energy Servs.*, 514 F.3d at 1249.

¹¹⁷ *In re Buszard*, 504 F.3d 1364, 1366 (Fed. Cir. 2007); *see also Yamamoto*, 740 F.2d at 1571; *Zletz*, 893 F.2d at 322.

¹¹⁸ See MPEP § 2173.05(a)(I).

¹¹⁹ See MPEP § 2173.02 (citing *Morton Int’l, Inc. v. Cardinal Chem. Co.*, 5 F.3d 1464, 1470 (Fed. Cir. 1993)); *see also Halliburton Energy Servs.*, 514 F.3d at 1249 (“Otherwise, competitors cannot avoid infringement, defeating the public notice function of patent claims.”).

¹²⁰ *Zletz*, 893 F.2d at 322.

¹²¹ See MPEP § 707.07(d).

¹²² See, e.g., *In re Skvorecz*, 580 F.3d 1262, at 1268–69 (Fed. Cir. 2009).

¹²³ *Halliburton Energy Servs.*, 514 F.3d at 1255.

¹²⁴ See MPEP § 2173.02.

¹²⁵ See MPEP § 706; *see also Best Practices in Compact Prosecution* (2009) examiner training materials, available at http://www.uspto.gov/patents/law/exam/exmr_training_materials.jsp.

¹²⁶ See 37 CFR 1.104(a)(1) (“On taking up an application for examination or a patent in a reexamination proceeding, the examiner shall make a thorough study thereof and shall make a thorough investigation of the available prior art relating to the subject matter of the claimed invention. The examination shall be complete with respect both compliance of the application * * * with the applicable statutes and rules and to the patentability of the invention as claimed, as well as with respect to matters of form, unless otherwise indicated.”).

¹²⁷ See MPEP § 707.07(g) (“Piecemeal examination should be avoided as much as possible. The examiner ordinarily should reject each claim on all valid grounds available * * *.”).

¹²⁸ See *Examiner Interview Training* (2009) examiner training materials, available at http://www.uspto.gov/patents/law/exam/exmr_training_materials.jsp.

¹²⁹ See MPEP § 713.04; *see also* 37 CFR 1.2 (“The action of the Patent and Trademark

Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.”).

¹³⁰ Note that, prior to allowance, the examiner may also specify allowable subject matter and provide reasons for indicating such allowable subject matter in an Office communication. *See* MPEP § 1302.14(I).

¹³¹ *Id.*

¹³² *Id.*

¹³³ *See* MPEP § 1302.14(II)(G).

¹³⁴ *See* MPEP § 1302.14(I).

¹³⁵ For determining whether claimed subject matter complies with the subject matter eligibility requirement of § 101, examiners should consult the *Interim Guidance for Determining Subject Matter Eligibility for Process Claims in View of Bilski v. Kappos*, 75 FR 43922 (July 27, 2010), and Memorandum entitled *New Interim Patent Subject Matter Eligibility Examination Instructions*, signed on August 24, 2009, available at <http://www.uspto.gov/patents/law/exam/memoranda.jsp>.

¹³⁶ For determining whether claimed subject matter complies with the utility requirement of § 101, examiners should consult the “Guidelines for Examination of Applications for Compliance with the Utility Requirement” set forth in MPEP § 2107.

¹³⁷ For determining whether claimed subject matter complies with the written description requirement of § 112, ¶1, examiners should consult the “Computer Programming and 35 U.S.C. § 112, First Paragraph, Guidelines” set forth in MPEP § 2161.01, and the “Guidelines for the Examination of Patent Applications Under the 35 U.S.C. 112, para. 1, ‘Written Description’ Requirement” set forth in MPEP § 2163, and for determining whether claimed subject matter complies with the enablement requirement of § 112, ¶1, examiners should consult the enablement guidelines set forth in MPEP § 2164 *et seq.*, including the “Examples of Enablement Issues—Computer Programming Cases” set forth in MPEP § 2164.06(c) and “Enablement Commensurate in Scope With the Claims” set forth in MPEP § 2164.08.

¹³⁸ For determining whether the claims comply with the nonobviousness requirement of § 103, examiners should use “Examination Guidelines for Determining Obviousness Under 35 U.S.C. 103” set forth in MPEP § 2141 and *Examination Guidelines Update: Developments in the Obviousness Inquiry after KSR v. Teleflex*, 75 FR 53643 (Sept. 1, 2010).

¹³⁹ *Ariad*, 598 F.3d at 1340.

¹⁴⁰ *Vas-Cath*, 935 F.2d at 1562–63.

¹⁴¹ *Id.*; *Ariad*, 598 F.3d at 1351.

¹⁴² *Ariad*, 598 F.3d at 1349.

¹⁴³ *Id.*; *see also LizardTech, Inc. v. Earth Res. Mapping, Inc.*, 424 F.3d 1336, 1343–46 (Fed. Cir. 2005); *Regents of the University of California v. Eli Lilly & Co.*, 119 F.3d 1559, 1568 (Fed. Cir. 1997).

¹⁴⁴ *Ariad*, 598 F.3d at 1350; *Enzo Biochem*, 323 F.3d at 968 (holding that generic claim language appearing in *ipsis verbis* in the original specification did not satisfy the written description requirement because it failed to support the scope of the genus

claimed); *Fiers v. Revel*, 984 F.2d 1164, 1170 (Fed. Cir. 1993) (rejecting the argument that “only similar language in the specification or original claims is necessary to satisfy the written description requirement”).

¹⁴⁵ *LizardTech*, 424 F.3d at 1346 (“[T]he description of one method for creating a seamless DWT does not entitle the inventor * * * to claim any and all means for achieving that objective.”).

¹⁴⁶ *Id.*

¹⁴⁷ *Ariad*, 598 F.3d at 1349 (“[A]n adequate written description of a claimed genus requires more than a generic statement of an invention’s boundaries.”) (*citing Eli Lilly*, 119 F.3d at 1568).

¹⁴⁸ *Id.*

¹⁴⁹ *Id.* at 1351; *Capon v. Eshhar*, 418 F.3d 1349, 1357–58 (Fed. Cir. 2005).

¹⁵⁰ *Fonar Corp. v. General Elec. Co.*, 107 F.3d 1543, 1549 (Fed. Cir. 1997).

¹⁵¹ *See* MPEP § 2161.01.

¹⁵² *In re Hayes Microcomputer Prods., Inc. Patent Litigation*, 982 F.2d 1527, 1533–34 (Fed. Cir. 1992).

¹⁵³ *Id.* at 1534 (emphasis in original).

¹⁵⁴ *Id.*

¹⁵⁵ *Id.*

¹⁵⁶ *See, e.g., In re Wright*, 999 F.2d 1557, 1561 (Fed. Cir. 1993); *In re Wands*, 858 F.2d 731, 736–37 (Fed. Cir. 1988).

¹⁵⁷ *Wands*, 858 F.2d at 737.

¹⁵⁸ *Id.*

¹⁵⁹ *Swinehart*, 439 F.2d at 213.

¹⁶⁰ *Id.*; *AK Steel Corp. v. Sollac*, 344 F.3d 1234, 1244 (Fed. Cir. 2003); *In re Moore*, 439 F.2d 1232, 1236 (CCPA 1971).

¹⁶¹ *Sitrick v. Dreamworks, LLC*, 516 F.3d 993, 999 (Fed. Cir. 2008) (“The scope of the claims must be less than or equal to the scope of the enablement to ensure that the public knowledge is enriched by the patent specification to a degree at least commensurate with the scope of the claims.”) (quotation omitted).

¹⁶² *Sitrick*, 516 F.3d at 999–1001.

¹⁶³ *ALZA Corp. v. Andrx Pharms., LLC*, 603 F.3d 935, 941 (Fed. Cir. 2010) (“ALZA was required to provide an adequate enabling disclosure in the specification; it cannot simply rely on the knowledge of a person of ordinary skill to serve as a substitute for the missing information in the specification.”); *Auto. Techs. Int’l, Inc. v. BMW of N. Am., Inc.*, 501 F.3d 1274, 1283 (Fed. Cir. 2007) (“Although the knowledge of one skilled in the art is indeed relevant, the novel aspect of an invention must be enabled in the patent.”).

¹⁶⁴ *Auto. Techs.*, 501 F.3d at 1283 (quoting *Genentech, Inc. v. Novo Nordisk A/S*, 108 F.3d 1361, 1366 (Fed. Cir. 1997)).

¹⁶⁵ *Genentech*, 108 F.3d at 1366; *see also ALZA Corp.*, 603 F.3d at 940–41.

¹⁶⁶ *ALZA Corp.*, 603 F.3d at 941; *Auto. Techs.*, 501 F.3d at 1283–84 (“[T]he ‘omission of minor details does not cause a specification to fail to meet the enablement requirement. However, when there is no disclosure of any specific stating material or of any of the conditions under which a process can be carried out, undue experimentation is required.’”) (quoting *Genentech*, 108 F.3d at 1366).

¹⁶⁷ *Auto. Techs.*, 501 F.3d at 1282.

¹⁶⁸ *Id.* at 1283.

¹⁶⁹ *Schreiber*, 128 F.3d at 1478; *In re Best*, 562 F.2d 1252, 1254 (CCPA 1977); *In re*

Ludtke, 441 F.2d 660, 663–64 (CCPA 1971); *Swinehart*, 439 F.2d at 212–213 (“[I]t is elementary that the mere recitation of a newly discovered function or property, inherently possessed by things in the prior art, does not cause a claim drawn to those things to distinguish over the prior art. Additionally, where the Patent Office has reason to believe that a functional limitation asserted to be critical for establishing novelty in the claimed subject matter may, in fact, be an inherent characteristic of the prior art, it possesses the authority to require the applicant to prove that the subject matter shown to be in the prior art does not possess the characteristic relied on.”).

¹⁷⁰ *In re Paulsen*, 30 F.3d 1475, 1479–80 (Fed. Cir. 1994).

¹⁷¹ *Id.*

¹⁷² *Id.*

¹⁷³ *Leapfrog Enters., Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1161 (Fed. Cir. 2007) (“Accommodating a prior art mechanical device that accomplishes [a desired] goal to modern electronics would have been reasonably obvious to one of ordinary skill in designing children’s learning devices. Applying modern electronics to older mechanical devices has been commonplace in recent years.”); *In re Vanner*, 262 F.2d 91, 95 (CCPA 1958); see also MPEP § 2144.04.

¹⁷⁴ *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 417 (2007); see also MPEP § 2143, Exemplary Rationales D and F.

¹⁷⁵ *Muniauction, Inc. v. Thomson Corp.*, 532 F.3d 1318, 1326–27 (Fed. Cir. 2008).

[FR Doc. 2011–2841 Filed 2–8–11; 8:45 am]

BILLING CODE 3510–16–P

DEPARTMENT OF EDUCATION

Notice of Proposed Information Collection Requests

AGENCY: Department of Education.

ACTION: Comment request.

SUMMARY: The Department of Education (the Department), in accordance with the Paperwork Reduction Act of 1995 (PRA) (44 U.S.C. 3506(c)(2)(A)), provides the general public and Federal agencies with an opportunity to comment on proposed and continuing collections of information. This helps the Department assess the impact of its information collection requirements and minimize the reporting burden on the public and helps the public understand the Department’s information collection requirements and provide the requested data in the desired format. The Director, Information Collection Clearance Division, Regulatory Information Management Services, Office of Management, invites comments on the proposed information collection requests as required by the Paperwork Reduction Act of 1995.

DATES: Interested persons are invited to submit comments on or before April 11, 2011.

ADDRESSES: Comments regarding burden and/or the collection activity requirements should be electronically mailed to *ICDocketMgr@ed.gov* or mailed to U.S. Department of Education, 400 Maryland Avenue, SW., LBJ, Washington, DC 20202–4537. Please note that written comments received in response to this notice will be considered public records.

SUPPLEMENTARY INFORMATION: Section 3506 of the Paperwork Reduction Act of 1995 (44 U.S.C. Chapter 35) requires that Federal agencies provide interested parties an early opportunity to comment on information collection requests. The Director, Information Collection Clearance Division, Regulatory Information Management Services, Office of Management, publishes this notice containing proposed information collection requests at the beginning of the Departmental review of the information collection. The Department of Education is especially interested in public comment addressing the following issues: (1) Is this collection necessary to the proper functions of the Department; (2) will this information be processed and used in a timely manner; (3) is the estimate of burden accurate; (4) how might the Department enhance the quality, utility, and clarity of the information to be collected; and (5) how might the Department minimize the burden of this collection on the respondents, including through the use of information technology.

Dated: February 4, 2011.

Darrin A. King,

Director, Information Collection Clearance Division, Regulatory Information Management Services, Office of Management.

Office of the Secretary

Type of Review: Extension.

Title of Collection: U.S. Department of Education Supplemental Information on the SF-424 Form.

OMB Control Number: 1894–0007.

Agency Form Number(s): SF-424 (U.S. Department of Education Supplemental Information).

Frequency of Responses: New Awards.

Affected Public: Businesses or other for-profit; Individuals or household; Not-for-profit institutions, State, Local, or Tribal Government, State Educational Agencies or Local Educational Agencies.

Total Estimated Number of Annual Responses: 19,000.

Total Estimated Number of Annual Burden Hours: 6,270.

Abstract: The U.S. Department of Education Supplemental Information form for the SF-424 is used together with the SF-424, Application for

Federal Assistance. The Supplemental Information form includes several needed data elements/questions that are not included on the SF-424, Application for Federal Assistance. We are requesting extension of the currently approved version of the Supplemental Information form.

Requests for copies of the proposed information collection request may be accessed from <http://edicsweb.ed.gov>, by selecting the “Browse Pending Collections” link and by clicking on link number 3910. When you access the information collection, click on “Download Attachments” to view. Written requests for information should be addressed to U.S. Department of Education, 400 Maryland Avenue, SW., LBJ, Washington, DC 20202–4537. Requests may also be electronically mailed to *ICDocketMgr@ed.gov* or faxed to 202–401–0920. Please specify the complete title of the information collection and OMB Control Number when making your request.

Individuals who use a telecommunications device for the deaf (TDD) may call the Federal Information Relay Service (FIRS) at 1–800–877–8339.

[FR Doc. 2011–2885 Filed 2–8–11; 8:45 am]

BILLING CODE 4000–01–P

DEPARTMENT OF EDUCATION

Native Hawaiian Education Program; Office of Elementary and Secondary Education; Overview Information; Native Hawaiian Education Program; Notice Inviting Applications for New Awards for Fiscal Year (FY) 2011

Catalog of Federal Domestic Assistance (CFDA) Number: 84.362A.

Dates:

Applications Available: February 9, 2011.

Deadline for Transmittal of Applications: April 11, 2011.

Full Text of Announcement

I. Funding Opportunity Description

Purpose of Program: The purpose of the Native Hawaiian Education (NHE) program is to support innovative projects that enhance the educational services provided to Native Hawaiian children and adults. These projects may include those activities authorized under section 7205(a)(3) of the Elementary and Secondary Education Act of 1965, as amended (ESEA).

Note: In prior years, Congress has expressly authorized that program funds may be used to support the construction, renovation, or modernization of any elementary school, secondary school, or structure related to an