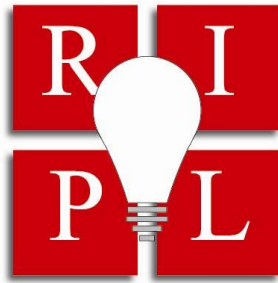


THE JOHN MARSHALL REVIEW OF INTELLECTUAL PROPERTY LAW



FUNCTIONAL ELEMENTS IN PATENT CLAIMS, AS CONSTRUED BY THE PATENT TRIAL AND APPEAL BOARD (PTAB)

TOM BRODY

ABSTRACT

Claims in patents include both structural elements and functional elements. Functional elements occur in various categories: (1) Functional elements that mandate a particular range of structures that are able to perform the required function; (2) Functional elements that mandate a particular cooperation between structures; (3) Compound noun/function functional elements, (4) Active-type functional elements; (5) “Capable of”-type functional elements, (6) Single-word structural elements that are typical nouns, but that are also functional elements, e.g., “plasticizer,” and (7) Quasi-functional elements that lack any patentable weight. This article discloses which of these types of functional elements confers the broadest claim scope, and which are most resistant to rejections under 35 U.S.C. § 102 or 35 U.S.C. § 103. The author also announces the discovery of a paradox in patent law, namely, the *Newman Paradox*, and compares it with another paradox, the *Wands-Vaeck Paradox*. This article describes two different traps, which can result from a failure to understand the proper construction of functional elements. These traps are The *Hough/Hovath* Trap, and The Trap of *In re Robertson*. This is the first article to provide an in-depth analysis of cases from the Patent Trial and Appeal Board (“PTAB”), previously known as the Board of Patent Appeals and Interferences (“BPAI”) (“Board”).

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FUNCTIONAL ELEMENTS IN PATENT CLAIMS, AS CONSTRUED BY THE PATENT TRIAL AND APPEAL BOARD (PTAB)

TOM BRODY*

I. INTRODUCTION

Patents contain two sections, the specification and the claims.¹ The claims identify the intellectual property, while the specification contains background information useful for defining the words in the claims and for providing guidance for making and using the invention.² Mainstream concerns in patenting include determining the persons to be named as inventors,³ determining the date of conception and the patent's priority date,⁴ drafting working and prophetic examples for the specification,⁵ claim drafting,⁶ duty to disclose,⁷ foreign filing strategies,⁸

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¹ 35 U.S.C. § 112(a)–(b) (2012).

² 35 U.S.C. § 112(a)–(b); 37 C.F.R. § 1.71 (2013); 37 C.F.R. § 1.75 (2013); U.S. PAT. & TRADEMARK OFFICE, U.S. DEP'T OF COMMERCE, MANUAL OF PATENT EXAMINING PROCEDURE § 608.01 (8th ed. Rev. 9, Aug. 2012) [hereinafter MPEP].

³ Dale L. Carlson & James R. Barney, *The Division of Rights Among Joint Inventors: Public Policy Concerns after Ethicon v. U.S. Surgical*, 39 IDEA 251, 257 (1999); David Hricik, Alexandra Gezi & Zachary Thomas, *Save a Little Room For Me: The Necessity of Naming as Inventors Practitioners Who Conceive of Claimed Subject Matter*, 55 MERCER L. REV. 635, 636 (2004).

⁴ Paula K. Davis & Steven P. Caltrider, *Timing (of Invention) is Everything: The Essential Role of the Written Description Requirement in Determining Conception*, 15 FED. CIR. B.J. 39, 40 (2005); Mark A. Lemley & Colleen V. Chien, *Are the U.S. Patent Priority Rules Really Necessary?*, 54 HASTINGS L.J. 1299, 1300 (2003); Charles L. Gholz, *A Critique of the New Rules and the New Standing Order in Contested Case/Interference Practice*, 87 J. PAT. & TRADEMARK OFF. SOC'Y 62, 63 (2005).

⁵ Thomas P. Noud, Mark S. Carlson & Paul T. Meiklejohn, *Patent Law Issues Affected by the Predictability of Technology in the Field of Invention*, 88 J. PAT. & TRADEMARK OFF. SOC'Y 603, 605 (2006); Brian P. O'Shaughnessy, *The False Inventive Genus: Developing a New Approach for Analyzing the Sufficiency of Patent Disclosure Within the Unpredictable Arts*, 7 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 147, 150–51 (1996).

⁶ See generally ROBERT C. FABER, LANDIS ON MECHANICS OF PATENT CLAIM DRAFTING (Practising Law Institute 5th ed. 2005); Tom Brody, *Functional Elements Can Ensure Allowance of Genus Claims*, 90 J. PAT. & TRADEMARK OFF. SOC'Y 621, 623 (2008) [hereinafter Brody, *Allowance of Genus Claims*]; Tom Brody, *Negative Claim Limitations in Patent Claims*, 41 AIPLA Q.J. 29, 31 (2013) [hereinafter Brody, *Negative Claim Limitations*].

⁷ Tom Brody, *Duty to Disclose: Dayco Products v. Total Containment*, 7 J. MARSHALL REV. INTELL. PROP. L. 325, 325 (2008) [hereinafter Brody, *Duty to Disclose*]; see also Dayco Prods., Inc. v. Total Containment, Inc., 329 F.3d 1358, 1364 (2003) (noting that “the extent, if any, to which the

claim construction,⁹ and claim construction's role in infringement analysis.¹⁰ To obtain a patent, one must also overcome common rejections in the form of anticipation under 35 U.S.C. § 102,¹¹ obviousness under 35 U.S.C. § 103,¹² and non-enablement under 35 U.S.C. § 112.¹³ An introduction to patent law, suitable for scientists and engineers, has been published.¹⁴

This article concerns functional elements in patent claims. Claims include *structural elements*, such as, hinge, spring, stent, photocell, steroid, and polypeptide, as well as *functional elements*. In claims, the terms “configured for,” “capable of,” and “adapted to,” are always followed by a functional element. In general, the Board construes functional elements that use the phrase “capable of” in exactly the same way that the Board construes functional elements that use the phrase, “adapted to” or “configured for.” In one published opinion from the Federal Circuit, the court has

Patent Office rulemaking was intended to provide guidance to the courts concerning the duty of disclosure in the context of inequitable conduct determinations is not clear”); *Ferring B.V. v. Barr Labs., Inc.*, 437 F.3d 1181, 1187 n.6 (Fed. Cir. 2006) (noting that both standards for the duty to disclose were valid).

⁸ Douglas N. Modlin & Michael A. Glenn, *International Patent Strategies for Individual Inventors*, 6 J. HIGH TECH. L. 129, 129 (2006).

⁹ The Federal Circuit frequently uses the “contexts of implication as a tool for claim construction,” which is problematic because “they are usually inadvertent and not drafted into the patent’s specification with the goal of narrowing claim scope.” Tom Brody, *Claim Construction Using Contexts of Implication*, 13 VA. J.L. & TECH. 3, at *2, *57 (2008) [hereinafter Brody, *Contexts of Implication*]; see also 35 U.S.C. § 112(a)–(b) (2012); *Bell Atlantic Network Servs. v. Covad Commc’ns Grp., Inc.*, 262 F.3d 1258, 1268 (Fed. Cir. 2001) (noting that “the specification may define claim terms ‘by implication’ such that the meaning may be ‘found in or ascertained by a reading of the patent documents’”) (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582, 1584 n.6 (1996)).

¹⁰ Tom Brody, *Preferred Embodiments in Patents*, 9 J. MARSHALL REV. INTELL. PROP. L. 398, 398–99 (2010) [hereinafter Brody, *Preferred Embodiments*]; see also *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 976 (1995) (“An infringement analysis entails two steps” where the first is to determine the scope of the claim and the second is a comparison between “the properly construed claims” and “the device accused of infringing”); Brody, *Contexts of Implication*, *supra* note 9 Table 2 (illustrating the two step analysis and how the Federal Circuit has applied it).

¹¹ 35 U.S.C. § 102(a) (“A person shall be entitled to a patent unless—the claimed invention was described in a printed publication, or in public use, on sale, or otherwise available to the public before the effective filing date of the claimed invention.”).

¹² 35 U.S.C. § 103. It states:

A patent for a claimed invention may not be obtained . . . if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains.

Id.; see also Tom Brody, *Obviousness in Patents Following the U.S. Supreme Court’s Decision of KSR International Co. v. Teleflex, Inc.*, 92 J. PAT. & TRADEMARK OFF. SOC’Y 26, 26–27 (2010) [hereinafter Brody, *Obviousness in Patents*].

¹³ 35 U.S.C. § 112 (“The specification shall . . . enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same . . .”); see also MPEP, *supra* note 2, § 706.03(c).

¹⁴ TOM BRODY, *CLINICAL TRIALS: STUDY DESIGN, ENDPOINTS AND BIOMARKERS, DRUG SAFETY, AND FDA AND ICH GUIDELINES* 607–23 (Academic Press 2012).

construed functional elements reciting “capable of” and reciting “adapted for” in different ways, as indicated by the footnote.¹⁵

Where a structural element is associated with a functional element, the functional element limits the claim to structures that are capable of performing that function.¹⁶ In other words, the functional element represents a laboratory test, where the test screens for potential structures or candidate structures that satisfy the recited function. This is also the first published in-depth article on functional elements, aside from the author’s earlier article on this same topic.¹⁷

A. The nature of the problem.

The most common elements in patent claims are listed below:

- Structural elements;
- Functional elements;
- Preamble;
- Means plus function elements;
- Negative limitations; and
- Markush groups.

A claim that contains only a structural element can be found in U.S. Pat. No. 3,156,523 issued to Seaborg.¹⁸ The claim, which contains only one structural element, reads:

“[Claim] 1. Element 95.”¹⁹

In contrast, an example of a claim to a structure, where most of the claim language takes the form of functional elements, can be found in countless patents.

¹⁵ *Aspex Eyewear, Inc. v. Marchon Eyewear, Inc.*, 672 F.3d 1335, 1349 (Fed. Cir. 2012). In dicta, which at least in part, narrowly tracked the facts of the case, the Federal Circuit has suggested that “capable of” language means something different from “adapted to” language. *Id.* “Capable of” has a broader scope, while “adapted to” is narrower, where “adapted to” is defined as follows. *Id.* According to the court, “adapted to” encompasses “capable of” and additionally “designed to.” *Id.* Where a claim recites that a structure is “capable of” a particular function, the phrase “capable of” encompasses structures that are capable of the function during the course of a use that is intended by the patent, as well as structures that are capable of accomplishing tasks through misuse or incidental use. *Id.* In contrast, “adapted to” encompasses only structures that are capable of the use that is set forth in the patent. *Id.*

¹⁶ MPEP, *supra* note 2, § 2173.05(g).

¹⁷ See generally Brody, *Allowance of Genus Claims*, *supra* note 6.

¹⁸ U.S. Patent No. 3,156,523 col.1 (filed Aug. 23, 1946).

¹⁹ *Id.* col.11 l.24.

One example is U.S. Pat. No. 6,170,651, issued to Taormina.²⁰ One of the functional elements in Claim 1 reads, “suitable for receiving in inserting fashion the pair of eyeglasses.”²¹ Another of the functional elements in the same claim reads, “which is actuated from a closed position to an open position in order to reveal an interior of said shell and to permit the insertion or removal of the pair of eyeglasses.”²²

The convoluted nature of these particular functional elements hints at the complex task of construing any claim that contains a functional element. What is convoluted is that functional elements are found nested within functional elements. The function indicated by “in order to” is nested within the function “which is actuated.”²³ Moreover, at first glance the meaning of the phrases, “suitable for” and “in order to,” might strike one as being somewhat cryptic. This author points out that “suitable for” and “in order to” are alternative versions of the more frequently used phrase, “capable of.”

The main problem in construing functional elements is as follows. Cases from the Federal Circuit are somewhat lacking in guidance for construing functional elements. The author reviewed all cases from the Federal Circuit that contain the terms “functional element,” “functional limitation,” and “functional language.” Most of these concerned *means plus function* elements, and hence are not relevant to the construction of functional elements.²⁴ Many of these cases merely referred to the existence of a functional element in the disputed claim, again failing to provide guidance on claim construction.²⁵ *Texas Instruments Inc. v. United States International Trade Commission*, a case from the Federal Circuit, cited a forty-five year old opinion from the Court of Customs and Patent Appeals (“CCPA”), holding that a functional element, “adds nothing to the patentability or substance of the claim.”²⁶ The Federal Circuit consequently refused to give patentable weight to a functional element.²⁷ But this type of logic is not consistent with the logic that is used by essentially all cases from the Board. The CCPA, the predecessor of the Federal Circuit, provides the following robust statement that functional elements do have patentable weight, referring to the functional elements by a term that is usually meant as a derisive term (“intended use”). *In re Benson* stated that:

Sometimes, as here, a material is as well defined by its intended use as by its dimensions or other physical characteristics, and in this case we know of

²⁰ U.S. Patent No. 6,170,651 (filed Dec. 17, 1999).

²¹ *Id.* col.7 l.27–28.

²² *Id.* col.7 l.31–34.

²³ *Id.* col.7 l.31–32.

²⁴ See *Welker Bearing Co. v. PHD, Inc.*, 550 F.3d 1090, 1095 (Fed. Cir. 2008); *LG Elecs., Inc. v. Bizcom Elecs., Inc.*, 453 F.3d 1364, 1372 (Fed. Cir. 2006); *Linear Tech. Corp. v. Impala Linear Corp.*, 379 F.3d 1311, 1319–20 (Fed. Cir. 2004); *Asyst Techs., Inc. v. Empak, Inc.*, 268 F.3d 1364, 1369–70 (Fed. Cir. 2001); *Chiuminatta Concrete Concepts, Inc. v. Cardinal Indus., Inc.*, 145 F.3d 1303, 1309 (Fed. Cir. 1998).

²⁵ See *Freedman Seating Co. v. Am. Seating Co.*, 420 F.3d 1350, 1362 (Fed. Cir. 2005); *Zodiac Pool Care Inc. v. Hoffinger Indus., Inc.*, 206 F.3d 1408, 1416 (Fed. Cir. 2000); *Ethicon Endo-Surgery, Inc. v. U.S. Surgical Corp.*, 93 F.3d 1572, 1577 (Fed. Cir. 1996); *Insta-Foam Prods., Inc. v. Universal Foam Sys., Inc.*, 906 F.2d 698, 701 (Fed. Cir. 1990).

²⁶ *Tex. Instruments Inc. v. ITC*, 988 F.2d 1165, 1172 (Fed. Cir. 1993) (*citing* *Israel v. Cresswell*, 166 F.2d 153, 156 (C.C.P.A. 1948)).

²⁷ *Id.*

no reason why the limitation in terms of use should not be placed in the claims and given meaning in their interpretation.²⁸

The Federal Circuit adopted the cases from the CCPA as precedent.²⁹

B. The nature of the solution.

This article mainly concerns cases from the Patent Trial and Appeal Board (“PTAB”), formerly known as the Board of Patent Appeals and Interferences (“BPAI”). At most, about six cases from the Federal Circuit provide any guidance on functional elements, and these cases are documented herein. In the context of civil procedure, nearly all of the cases heard by the Board are appeals from an examiner’s final rejection. Cases from the Board constitute a huge body of applied case law that provides guidance on many more issues in claim construction than will ever be found in cases from the Federal Circuit. Accounts of the history of the Board are found in the cited references.³⁰ About 600 cases from the Board concern functional elements. In reviewing all of these cases, the author discovered about a dozen distinct issues—that is, a dozen distinct themes—in construing functional elements.

C. Example of a claim with a functional element.

The following opinion concerned a claim possessing a functional element, where the wording in the claim dramatically establishes the connection between the function and a laboratory test. The footnote illustrates patents where a functional element in the claim was correlated with a laboratory test.³¹ Most claims that

²⁸ Application of Benson, 418 F.2d 1251, 1254 (C.C.P.A. 1969).

²⁹ STEVEN FLANDERS, *THE FEDERAL CIRCUIT—A JUDICIAL INNOVATION, ESTABLISHING A U.S. COURT OF APPEALS* 38–39 (Twelve Tables Press 2010); *South Corp. v. U.S.*, 690 F.2d 1368, 1369 (Fed. Cir. 1982) (“We hold that the holdings of our predecessor courts, the United States Court of Claims and the United States Court of Customs and Patent Appeals . . . shall be binding as precedent in this court.”).

³⁰ See generally Paul J. Federico, *The Board of Appeals 1861–1961*, 43 J. PAT. & TRADEMARK OFF. SOC’Y 691, 691 (1961); Paul J. Federico, *Evolution of Patent Office Appeals*, 22 J. PAT. & TRADEMARK OFF. SOC’Y 838, 838 (1940); Jeffrey W. Rennecker, *Ex Parte Appellate Procedure in the Patent Office and the Federal Circuit’s Respective Standards of Review*, 4 TEX. INTELL. PROP. L.J. 335, 340 (1996); Alan L. Koller, *The Role of the Patent Commissioner in Designating Panels from the Board of Patent Appeals and Interferences*, 34 IDEA 185, 187 (1994).

³¹ Claims to devices or to compositions of matter, where the claim includes a functional element, and where the functional element is further confined or restricted by the identification of a screening test, can be found in the following patents. U.S. Pat. No. 7,812,214 issued to Koele, et al, requires use of the ASTM-E132 test. See U.S. Patent No. 7,812,214 col. 11 l. 38–40 (filed Feb. 28, 2006). U.S. Pat. Nos. 8,021,664 issued to Berinstein, and 7,842,294 issued to Andersen, require use of the ELISPOT test. See U.S. Patent No. 8,021,664 col. 77 l. 45 (filed Apr. 15, 2004); U.S. Patent No. 7,842,294 col. 63 l. 3 (filed Nov. 18, 2004). U.S. Pat. No. 4,075,131 claims a shampoo, where the claim contains a functional element, and where the functional element requires that the function (viscosity) of the shampoo be tested with a specific machine, a viscometer. See U.S. Patent No. 4,075,131 col. 10 l. 41–50 (filed Sept. 17, 1976). *Ex parte Ahrens* discloses a functional element that represents a laboratory test. *Ex parte Ahrens*, No. 2008-3812, 2008 WL 4266207, at *1, *3 (B.P.A.I.

possess a functional element do not also identify a laboratory test. However, it is important that the specification contain a sentence or two that describes a laboratory test that corresponds to each of the functional elements in the claim set. On occasion, during the prosecution phase of a patent application, the examiner requires that wording describing the test be added, by way of amendment, to the claim.

The following provides a model example of a claim with a functional element. The claim is a model example, because the functional element contains a disclosure of a laboratory test. Although functional elements that actually describe a laboratory test are uncommon, it should be kept in mind that all functional elements in all patents refer to functions that can be tested, verified, or compared, by way of a laboratory test.

Ex parte Kao concerned the following claim.³² The functional element is shown in **bold**. The associated structure is “tablet.” The functional element requires that the tablet possess the function of dissolving at the indicated rate. The rate is 15–50% over the course of an hour.

[Claim] 1. An analgesically effective . . . pharmaceutical composition . . . in the form of a tablet, comprising oxymorphone or a pharmaceutically acceptable salt thereof . . . **wherein upon placement of the composition in an in vitro dissolution test comprising USP Paddle Method at 50 rpm in 500 ml media having a pH of 1.2 to 6.8 at 37 °C, about 15% to about 50%, by weight, of the oxymorphone . . . is released from the table at about 1 hour in the test.**³³

The test requires that the composition be capable of dissolving at a specific rate when placed in a medium of pH 1.2–6.8.

In drafting claims that include a functional element, the attorney or agent should consider including, in the specification, a short description of a laboratory test that can screen devices for the ability (or inability) to perform that function. The disclosure of this test can be useful when the attorney needs to draft a rebuttal against a rejection that alleges non-enablement, or when the attorney needs to draft a rebuttal against a rejection that alleges invalidity under 35 U.S.C. § 102 or 35 U.S.C. § 103. For rebutting a rejection that alleges invalidity, the rebuttal should provide a reasoned argument why the cited prior art flunks the laboratory test—that is, why the cited prior art does not possess the function.

Where a functional element includes a short description of a laboratory test, and where this description includes various devices or instruments, it must be recognized that the names of these devices and instruments do not have any patentable weight. This issue of structural terms residing within a functional element, which is a

Sept. 16, 2008). The Board construed the functional element “capable of initiating transcription in a plant cell,” and characterized it as a test, writing that, “it was routine in the art as of the application filing date to make and test promoter fragments and sequence variants for activity.” *Id.* (emphasis omitted). The activity was that of initiating transcription in a plant cell. *Id.* at *1.

³² *Ex parte Kao*, No. 2009-013710, 2010 WL 200411, at *1 (B.P.A.I. Jan. 12, 2010).

³³ *Id.*

potential trap, is detailed below in commentary on *Ex parte Hough* and *Ex parte Hovath*.³⁴

II. METHODOLOGY

In June 2011, the author inputted various search terms for exploring opinions from the Board, using the search device at www.uspto.gov. These search terms included “Swinehart” in combination with, for example, “functional limitation,” “functional element,” and “functional language,” as well as more targeted searches, using combinations of terms such as: (1) “assay method” AND “functional,” (2) “ex parte levy” AND “functional,” (3) “ex parte levy” AND “functionally,” (4) “indefiniteness” AND “functional element,” (5) “indefiniteness” AND “functional limitation” and “intended use.” In October 2011, the author conducted another large search, specifically targeted to all existing cases citing *In re Oelrich*, *In re Rijckaert*, or *Ex parte Levy*, or citing the forty most recent cases citing *In re Swinehart* (but not citing *Oelrich*, *Rijckaert*, or *Levy*). In November 2011, the author considered the possibility that bias could result from using a case name as a query term, and thus conducted three more searches inputting “functional element,”³⁵ “functional language,”³⁶ “functional limitation,”³⁷ and “functionally claimed”³⁸ as the query term, but without imputing a case name. In November 2012, the author conducted additional searches of the Board’s most recent opinions. To acquire opinions from the Federal Circuit, the author used LexisNexis® at Boalt Hall at the University of California at Berkeley. In January 2013, the author conducted an additional search of cases from the Board (dating from Jan. 1, 2012 to Dec. 31, 2012), using the query term “inherency,” reviewed all 329 cases, and detected fifteen more relevant cases, all of which are cited herein.

III. PHYSICAL NATURE OF FUNCTIONAL ELEMENTS, IN THE CONTEXT OF A CLAIM.

A. Subsets of functional elements that dictate structure.

Functional elements can confer two types of structure to the structural elements in the claim. The first type of structure is the shape, dimension, or chemical composition of a particular structural element. The second type of structure is the arrangements in space between two or more structural elements that are recited in the claim.

*Geneva Pharmaceuticals, Inc. v. GlaxoSmithKline PLC*³⁹ and *R.A.C.C. Industries, Inc. v. Stun-Tech, Inc.*⁴⁰ set forth the proper role of functional elements in

³⁴ See *infra* Part VIII.F.

³⁵ The author reviewed all 40 of the hits.

³⁶ The author reviewed the first 180 consecutive hits out of 566 hits.

³⁷ The author reviewed the first 240 consecutive hits out of 1292 hits.

³⁸ The author reviewed all twelve cases.

³⁹ *Geneva Pharm., Inc. v. GlaxoSmithKline PLC*, 349 F.3d 1373, 1384 (Fed. Cir. 2003).

claims. These cases provide the following rules. First, it is the case that, “functional [language] covers all embodiments performing the recited function.”⁴¹ Second, it is the case in anticipation analysis that “[f]unctional language in an apparatus claim requires that an accused apparatus possess the capability of performing the recited function.”⁴²

According to the Manual of Patent Examining and Procedure (“MPEP”), “[a] functional limitation is often used in association with an element, ingredient, or step of a process to define a particular capability or purpose that is served by the recited element, ingredient or step.”⁴³ Thus, where a claim encompasses several variations of one device or of one composition, and where the claim includes a functional element, it is the case that the claim covers only those devices or compositions that exhibit the function that is recited by the functional element. The functional element serves as a screening assay.

The following concerns functional elements that dictate relationships between different structural elements. In *Innova/Pure Water Inc. v. Safari Water Filtration Sys. Inc.*, the court noted that the functional element, “operatively connected” is “a general descriptive [claim] term frequently used in patent drafting to reflect a functional relationship between claimed components,” that is, the term “means the claimed components must be connected in a way to perform a designated function.”⁴⁴

1. Functional element that dictates the shape, dimension, or chemical composition of a particular structural element.

Claim construction of a claim with a functional element can be completed by determining if the recited function compels a particular structure for the claimed device. For example, in *Ex parte Ignatiev*, the Board wrote that proper claim construction involves asking “whether the functional language structurally distinguishes the claimed apparatus from the prior art apparatus.”⁴⁵ To give another example, in *Ex parte Adler*, the claim was to a molecule having the function of binding to chemicals with a bitter taste.⁴⁶ The Board held the range of structures of the claimed molecules—that is, the genus of molecules—was governed by “functional characteristics when coupled with a known or disclosed correlation between function and structure.”⁴⁷ In *Ex parte Abad*, the claim was to a nucleic acid having a pesticidal function.⁴⁸ The functional element in the claim was, “which is pesticidal

⁴⁰ *R.A.C.C. Indus., Inc. v. Stun-Tech, Inc.*, No. 98-1186, 1998 U.S. App. LEXIS 30769, at *9 (Fed. Cir. Dec. 2, 1998).

⁴¹ *Geneva Pharm.*, 349 F.3d at 1384.

⁴² *R.A.C.C.*, 1998 U.S. App. LEXIS 30769, at *9 (citing *Intel Corp. v. U.S. Int’l Trade Comm’n*, 946 F.2d 821, 832 (Fed. Cir. 1991)).

⁴³ MPEP, *supra* note 2, § 2173.05(g).

⁴⁴ *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1118 (Fed. Cir. 2004).

⁴⁵ *Ex parte Ignatiev*, No. 2009-011747, 2010 WL 1188327, at *4 (B.P.A.I. Mar. 25, 2010).

⁴⁶ *Ex parte Adler*, No. 2006-0157, at *3 (B.P.A.I. Mar. 23, 2006).

⁴⁷ *Id.* at *7.

⁴⁸ *Ex parte Abad*, No. 2007-4213, 2008 WL 904456, at *1 (B.P.A.I. Apr. 3, 2008).

for at least one pest.”⁴⁹ The *Abad* opinion teaches that claim construction can involve a determination of which variations (which species) of the claimed nucleic acid possesses the function that is required by the functional element. The *Abad* opinion expressly stated that the functional element “defined” the claimed molecule.⁵⁰ The Board wrote that “Claim 1 is directed to a nucleic acid defined by [the following] properties . . . [including having] pesticidal activity towards a pest.”⁵¹

The following provides another example. *Ex parte Takahashi* stated that the recitation of “intended use”—that is, the recitation of the functional element—can lend patentable weight to a claim, where the appropriate approach to claim construction is to determine if the prior art apparatus is capable of performing the intended use.⁵² In other words, if the prior art cannot perform the intended use, the claim element has prevented the prior art from invalidating the claim. The Board’s words express the general approach to claim construction. The Board wrote that “the prior art structure meets the claims because the prior art apparatus is capable of performing the intended use.”⁵³

Ex parte Johnson concerns the functional element highlighted below:

“a composition comprising . . . a zinc containing material **having an aqueous solubility . . . of less than about 25% by weight.**”⁵⁴

The associated structure is “zinc containing material.” In construing the claim, the Board reviewed the specification, and observed definitions, examples, and the disclosure of a screening assay that tests aqueous solubility.⁵⁵ The screening assay determines the solubility of any given species, and those that give a positive test result are covered by the claims.⁵⁶ Where a species gives a negative result with the screening assay, that particular species is not covered by the claim.⁵⁷ In view of the definitions, examples, and screening assay, the Board in *Ex parte Johnson, supra*, reversed the rejections for lack of written description and for non-enablement, and held the claim to be valid.⁵⁸

2. Functional element that dictates an arrangement of structural elements.

One subset of functional element is one that dictates the positioning of various structural elements with respect to each other. This subset of functional elements is set forth by *Ex parte Flowers*.⁵⁹ In this opinion, the claim contained an element that

⁴⁹ *Id.*

⁵⁰ *Id.* at *10.

⁵¹ *Id.*

⁵² *Ex parte Takahashi*, No. 2004-2192, 2004 WL 2733658, at *2 (B.P.A.I. Sept. 30, 2004).

⁵³ *Id.*

⁵⁴ *Ex parte Johnson*, No. 2009-006686, 2009 WL 5455504, at *1 (B.P.A.I. Dec. 30, 2009).

⁵⁵ *Id.* at *2–3.

⁵⁶ *Id.* at *2.

⁵⁷ *Id.*

⁵⁸ *Id.* at *8.

⁵⁹ *Ex parte Flowers*, No. 2008-1069, 2008 WL 503577, at *5 (B.P.A.I. Feb. 21, 2008).

confers spatial arrangements of the claimed structural elements.⁶⁰ In characterizing the functional element, the Board wrote, “[w]e construe this clause to set forth spatial limitations on the alignment structure relative to the front lip of the tub in functional terms.”⁶¹ This special subset of functional element was also used in *Ex parte Paul*, where the functional element, “in contact with,” determines an arrangement of structures.⁶² Similarly, in *Ex parte Kanflod*, the issue was a functional element that described a particular arrangement that allows cooperation between structural elements.⁶³ *Ex parte Flowers*, *Ex parte Paul*, and *Ex parte Kanflod* disclose that functional elements impose requirements on claimed structures, but can also mandate an arrangement between the structures described by the functional element in the claim. These three cases provide the attorney with a powerful claim-drafting tool.

IV. THE PRACTICAL UTILITY OF FUNCTIONAL ELEMENTS.

Functional elements in claims fall into various categories and serve various uses. These categories include:

Taking the place of a structural element, thereby enhancing claim breadth;⁶⁴

Taking the place of a structural element where the structure is unknown or cannot be defined by the inventors;⁶⁵

Distinguishing the claimed invention from the prior art, thereby defending the claim from rejections for anticipation (35 USC § 102) or for obviousness (35 USC § 103);⁶⁶ and

Confining the scope of a structural element that is a broad genus, thereby ensuring compliance with the requirement for enablement under 35 USC § 112. Functional elements are routinely used in biotechnology claims.⁶⁷

⁶⁰ *Id.*

⁶¹ *Id.*

⁶² *Ex parte Paul*, No. 2007-3404, 2008 WL 552676, at *1 (B.P.A.I. Feb. 29, 2008).

⁶³ *Ex parte Kanflod*, No. 2009-006604, 2010 WL 3032866, at *1 (Aug. 2, 2010).

⁶⁴ Brody, *Allowance of Genus Claims*, *supra* note 6, at 623.

⁶⁵ Personal communication with Mark Lemley, William H. Neukom Professor of Law at Stanford Law School, at Improving the Interface Between the USPTO and the Federal District Courts, USPTO & Berkeley Center for Law & Technology, Bancroft Hotel, Berkeley, CA (June 7, 2011). Professor Lemley stated:

You might do it because you can't define the invention any other way, so the chemical product by process claims fit into this category. . . . It's [functional elements]—not quite the same thing [as product by process claims], but it seems to me to be analogous. . . . I have an antigen that I can't characterize except by what it binds to.

Id.

⁶⁶ Brody, *Allowance of Genus Claims*, *supra* note 6, at 623.

The following discloses a spectrum of favorable to unfavorable aspects of functional elements. The following bullet points and narratives outline the advantages and disadvantages of using functional elements in claim drafting.

- Advantage. Enabling broader claim scope. This advantage is documented by the following statement in *Ex parte Kolarov*: “This functional limitation renders the claim quite broad, and covers essentially any embodiments that perform the recited function of matching a capacity of a communication network.”⁶⁸
- Advantage. Taking the place of structural language, where structural descriptions are not possible.⁶⁹
- Advantage. Facilitate communication with jury.⁷⁰
- Advantage. Adding difficulty to prior art searches that are conducted by an adverse party. On the other hand, the corresponding disadvantage is that when an attorney is contemplating filing a patent application, but first intends to conduct a prior art search, the presence of functional elements in the prior art can encumber the attorney’s prior art search.⁷¹
- Disadvantage. After filing the patent application, use of a functional element can have the disadvantage of a consequent increase in prior art rejections based on citations from technologies that are remote to the claims. This fact-pattern is detailed below under the heading, “A. Worst-case scenario.”⁷²
- Disadvantage. The attorney or agent might be tempted to use a functional element that is so broad and indistinct, that the functional element fails to confine the associated structural element to any particular dimension or substance. *Ex parte Edlund* provides an example of this disadvantage.⁷³ A more detailed example of this

⁶⁷ *Id.* at 653.

⁶⁸ *Ex parte Kolarov*, No. 2009-005070, 2010 WL 1252103, at *5 (B.P.A.I. Mar. 30, 2010).

⁶⁹ Brody, *Allowance of Genus Claims*, *supra* note 6, at 623.

⁷⁰ Personal communication with Bruce McCubbrey, Counsel at Manatt, Phelps & Phillips, LLP, at Improving the Interface Between the USPTO and the Federal District Courts, USPTO & Berkeley Center for Law & Technology, Bancroft Hotel, Berkeley, CA (June 7, 2011) [hereinafter Personal communication with McCubbrey].

⁷¹ This observation is based on the author’s thirteen years of experience in prior art searches and invalidity analysis.

⁷² See *infra* Part V.A.

⁷³ *Ex parte Edlund*, No. 2009-014696, 2010 WL 4991390, at *4–5 (B.P.A.I. Dec. 5, 2010). Regarding the failure of the functional elements to confer any particular shape, dimension, or composition, to the structural elements in the claim, the opinion stated:

Edlund has not claimed a process, or even an apparatus that positively recites the presence of certain materials that are conveyed to various parts of the apparatus. . . . In

disadvantage is shown below, under the heading, “B. Worst-case scenario.”⁷⁴

- Disadvantage. The attorney or agent might draft a functional element but neglect to associate it with a bona fide structural element. For example, the functional element might be associated with a word that does not mandate any structure, such as the word, “member,” “device,” “element,” “component,” “mechanism,” or “structure.” The result is that the claim can be rendered invalid.⁷⁵

Functional elements in claims are good, in that they can take the place of structural language, where it is impossible or difficult to use structural language. Functional elements are also good, in that they usually enable claim drafting that encompasses a broader range of structures than a corresponding structural element, thereby leading to broader claim scope.

Functional elements might be preferred in the early stages of any particular technology, where there will not likely be any existing prior art structures that can perform the same function, while structural elements might be preferred in late-stage technologies, where the field is crowded with patented inventions.

Regarding the goal of enhancing communication with a jury, functional elements in claims can prevent the claim from resembling the traditional song, *Dem Bones*, thereby making the claim easier for the jury to understand.⁷⁶ *Dem Bones* contains the lyrics, “The leg bone connected to your knee bone/The knee bone connected to your thigh bone/The thigh bone connected to your hip bone.”⁷⁷ This rationale for using functional elements finds a basis in the case law, as articulated in the MPEP: “a claim which fails to interrelate essential elements of the invention as defined by applicant(s) in the specification may be rejected under 35 U.S.C. 112, second paragraph, for failure to point out and distinctly claim the invention.”⁷⁸

Thus, where a device contains two or more structures, a functional element can be used to disclose a relation between the two structures.

the present claims, however, Edlund seeks to use the term “adapted to” to define structures solely by their function within the claimed apparatus.

Id.

⁷⁴ See *infra* Part V.B.

⁷⁵ *Halliburton Oil Well Cementing Co. v. Walker*, 329 U.S. 1, 14 (1946), cited in *Ex parte Eidson*, No. 2007-1098, 2007 WL 1787646, at *3 (B.P.A.I. June 20, 2007). *Ex parte Harvey* identifies elements that are purely functional as a distinct class of claim elements, stating that, “[t]his type of purely functional claiming where the statement of function is not attached to any structure or act, or to any ‘means’ or ‘step,’ is not permitted.” *Ex parte Harvey*, No. 2007-2115, at *46 (B.P.A.I. Jan. 13, 2009); see also *Ex parte Merdan*, No. 2010-009279, 2010 WL 3454262, at *2 (B.P.A.I. Aug. 31, 2010).

⁷⁶ Personal communication with McCubbrey, *supra* note 70; Mark Czerniec, *Ezekiel and Dry Bones: The Bone Song (Dem Bones Dem Bones)*, MARKCZ.COM (Oct. 19, 2011, 1:25 P.M.), <http://markcz.com/bone-song/>.

⁷⁷ Czerniec, *supra* note 76. Lyrics based on Ezekiel 37:1-10. *Id.*

⁷⁸ MPEP, *supra* note 2, § 2172.01.

V. EXAMPLES OF PATENT PROSECUTION THAT INVOLVE REJECTIONS AGAINST A CLAIM,
WHERE THE REJECTION WAS DIRECTED AGAINST A FUNCTIONAL ELEMENT.

The following examples illustrate the prosecution of claims having a functional element, and illustrate a typical scenario of a rejection, as well as selected worst-case scenarios involved in patent prosecution.

The following illustrates the typical type of prior art that is cited against a claim—that is, prior art that resides in the same technical field as the claim. This is not a worst-case scenario, but this example provides a context for understanding the worst-case scenarios that are subsequently disclosed below.

In *Ex parte Glidewell*, the prior art device and the claimed device were both fishing tackle boxes.⁷⁹ Claim 1 contained the following recitation. The associated structure is “slot”:

said vertical plane defining a slot **adapted to removably hang hooks of artificial bait**.⁸⁰

Thus, the invalidity question was whether the cited prior art (Bruce) disclosed a slot that could perform this same function.⁸¹ Bruce disclosed a fishing tackle box with slots.⁸² Even though Bruce did not disclose anything about *removably hanging hooks of artificial bait*, the Board held that Bruce was still capable of performing the function, and rejected the claim.⁸³ In other words, Bruce did not **expressly** disclose the functional element. Instead, Bruce **inherently** disclosed the functional element.

The above is the usual scenario, when an examiner or the Board studies a prior art reference, and seeks an express disclosure or an inherent disclosure of a functional element.

A. Worst-case scenario, relating to invalidation by prior art.

The author refers to the following examples as “worst-case scenarios,” because it is difficult for an inventor to rebut the allegation that the prior art is capable of the same function as a function of the claimed invention. This is a worst-case scenario because the attorney or agent is not likely to detect this reference by way of a prior search—that is, a prior art search conducted before filing the patent application.

1. The inventor fruitlessly argued that a hair clip is not a medical clamp.

When an attorney chooses to use a functional element it invites the following worst-case scenario. The examiner may find a prior art device that is in a field

⁷⁹ *Ex parte Glidewell & Horton, Jr.*, No. 2008-5112, 2008 WL 5228902, at *1, *2 (B.P.A.I. Dec. 12, 2008).

⁸⁰ *Id.* at *1.

⁸¹ *Id.* at *2.

⁸² *Id.*

⁸³ *Id.* at *6.

totally afield from the claimed invention, but where the prior art device is capable of the very same function as that recited in the functional element. *Ex parte Ortiz* provides an example.⁸⁴ The claim concerned a medical device.⁸⁵ The associated structure is “clamp body”:

[Claim] 13. A clamp for gastric reduction surgery, comprising: a clamp body **shaped and dimensioned to create a gastric pouch**.⁸⁶

The examiner’s job *prima facie* task is to find prior art that possesses structural elements that correspond to the structural elements of the claim.⁸⁷ Also, in the situation where the claim contains a functional element, the examiner’s *prima facie* task is to find structural elements in the prior art that possess the same function.⁸⁸ Thus, in *Ex parte Ortiz*, the examiner cited the Shyu prior art (U.S. Patent No. D473,342),⁸⁹ which disclosed a hair clip (see Figure 1). The inventor fruitlessly argued that the **hair clip** was not intended for use in the stomach.⁹⁰ Referring to the inventor’s fruitless argument, the opinion stated that “Appellants’ sole contention regarding the Examiner’s rejection of claim 13 as being anticipated by Shyu is that no one in the medical profession would attempt to use a hair clip during a surgical procedure.”⁹¹ But the examiner argued, and the Board agreed, that “placement of this hairclip in the stomach could form a pouch,” as required by the claims.⁹² The Board affirmed the rejection.⁹³ Thus, one risky and dangerous aspect of using a functional element in a claim, is that the inventor will not likely be aware of devices in a field that is totally unrelated to her invention, and will not have performed any kind of prior art search of that remote field before drafting the claims, and submitting the patent application.

⁸⁴ *Ex parte Ortiz*, No. 2009-012288, 2011 WL 2513948, at *2 (B.P.A.I. June 22, 2011).

⁸⁵ *Id.* at *1.

⁸⁶ *Id.*

⁸⁷ 37 C.F.R. § 1.104(e)(2) (2013).

⁸⁸ *Ortiz*, 2011 WL 2513948, at *2.

⁸⁹ *Id.* at *1, *2.

⁹⁰ *Id.* at *2.

⁹¹ *Id.*

⁹² Examiner’s Answer, U.S. Patent Application No. 11/197,528, at 7 (Apr. 16, 2009).

⁹³ *Ortiz*, 2011 WL 2513948, at *2.

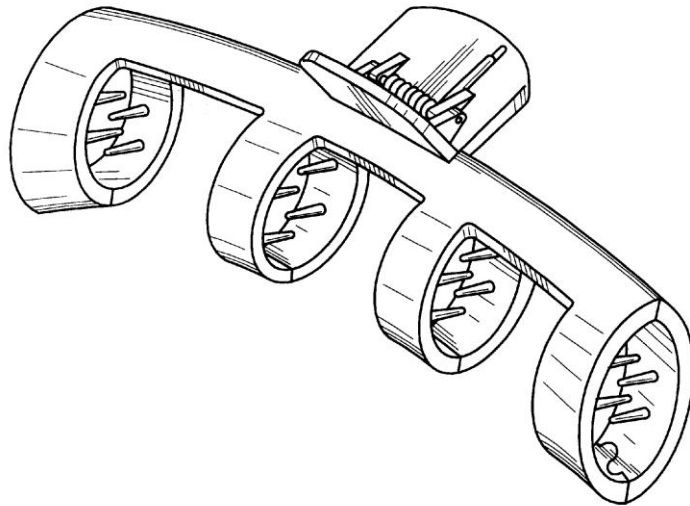


Figure 1.

2. *The inventor fruitlessly argued that a dishwashing pad is not a medical device for constraining the heart.*

The same type of worst-case scenario occurred in *Ex parte Alferness*, which concerned a cardiovascular medical device, where the device was **a jacket for constraining the heart**.⁹⁴ The claim contained functional language.⁹⁵ Unfortunately for the inventor, the examiner found a patent dating from 1928 (U.S. Pat. No. 1,682,119), which disclosed **a jacket for holding soap chips**.⁹⁶ This device was the well-known Brillo® pad.⁹⁷ Both the cardiovascular jacket and the Brillo pad were capable of performing the same function. The result is that the claim was rendered invalid in view of the cited prior art.⁹⁸

To reiterate, a danger of using a functional element instead of an appropriate structural element is that the examiner may find a device in a remote technology that is capable of performing the same function. Where the examiner finds a device

⁹⁴ *Ex parte Alferness*, No. 2008-4555, 2009 WL 180335, at *1 (B.P.A.I. Jan. 23, 2009).

⁹⁵ *Id.* at *1, *5.

⁹⁶ *Id.*; see also U.S. Patent No. 1,682,119 at 1, l.1–7 (filed Oct. 8, 1925).

⁹⁷ '119 Patent, at 1, l.1–7.

⁹⁸ *Alferness*, 2009 WL 180335, at *9.

that is capable of performing the same function, the prior art device can render the claim invalid.

A similar type of unexpected backfiring of an attempt to use functional elements is shown in *Ex parte Meyer*.⁹⁹ In this opinion, the claim was to a hand-held **massaging machine**.¹⁰⁰ The functional element was “wherein the user may grasp the handle portion and apply the massage effect to a body part.”¹⁰¹ However, the claim was invalidated by a prior art device that was a **motorized wire brush**.¹⁰² The inventor fruitlessly argued that a user would not use a motorized wire brush as a massage device.¹⁰³

The take-home lesson is that attorneys and agents should be aware that where a claim to a structure relies extensively on functional language, it increases the risk that the examiner will find invalidating prior art in technologies that are totally remote from technology of the presently claimed invention.

B. Worst-case scenario, relating to rejections for lack of written description (35 U.S.C. § 112).

The following problem is likely to arise in the unpredictable arts—that is, chemistry and biology—where the specification of a patent application identifies only one or two species of the invention, but where the claim set encompasses a genus. The advantage to the inventor of drafting this type of claim is that the genus claim covers an open-ended number of pharmaceuticals, but the inventor only did enough laboratory work to acquire complete information on the molecular structure of one species. But the disadvantage is that if the function is too broad, the claim will be rejected.

Ex parte Norin concerned the following claim.¹⁰⁴ The associated structure is “protein.”

[Claim] 1. An isolated . . . protein . . . **which binds natural killer cells**.¹⁰⁵

Thus, the inventor was attempting to create intellectual property that encompassed an unlimited number of proteins by the technique of submitting a claim that recited the function of this unlimited number of proteins.¹⁰⁶ The function was that of binding to natural killer cells (NK cells). Killer cells are a type of cell in the immune system.¹⁰⁷ The Board rejected the claim for lack of written description, writing that, “Appellant has not provided any identification of a single region or

⁹⁹ *Ex parte Meyer*, No. 2009-002681, 2009 WL 2403810, at *2 (B.P.A.I. Aug. 4, 2009).

¹⁰⁰ *Id.* at *1.

¹⁰¹ *Id.*

¹⁰² *Id.* at *2.

¹⁰³ *Id.* at *3–4.

¹⁰⁴ *Ex parte Norin*, No. 2009-010366, 2010 WL 2420454, at *1 (B.P.A.I. June 15, 2010).

¹⁰⁵ *Id.*

¹⁰⁶ *Id.* at *5–6.

¹⁰⁷ TOM BRODY, CLINICAL TRIALS: STUDY DESIGN, ENDPOINTS AND BIOMARKERS, DRUG SAFETY, AND FDA AND ICH GUIDELINES 503–16 (Academic Press/Elsevier 2012).

multiple regions within the p38.5 protein which are involved in NK binding,” citing the on-point case, *University of Rochester v. G.D. Searle & Co.*¹⁰⁸ The take-home lesson of *Ex parte Norin* is relevant to the unpredictable sciences. The issues in *Ex parte Norin* and in *Rochester v. Searle* rarely arise in cases relating to the predictable arts, such as engineering.¹⁰⁹

The take-home lesson is that attorneys and agents should use functional elements with care and restraint when claim-drafting in the unpredictable arts.

Ex parte Waldmann is similar to *Ex parte Norin*, in that the claims also attempt to cover an antibody.¹¹⁰ The claim was as follows. The associated structure is “antibody”:

[Claim] 1. A pharmaceutical comprising . . . a therapeutic antibody **that binds to a therapeutic target**, said antibody being modified with a peptide **that reduces binding of the antibody to the therapeutic target**.¹¹¹

The Board rejected the claim for failing to satisfy the written description requirement, writing:

Appellants’ argument reduces the invention to the solely functional elements. . . . That is the central issue here, where only a single species of antibody and peptide are disclosed, we conclude that Appellants’ claims “merely recite a description of the problem to be solved while claiming all solutions to it.”¹¹²

The Board cited *Ariad Pharmaceuticals, Inc. v. Eli Lilly and Co.*¹¹³ and *University of Rochester v. G.D. Searle and Co.*¹¹⁴ The take-home lesson is that at least in the unpredictable arts, functional elements can introduce an increased risk for rejections under 35 U.S.C. § 112 for lack of written description.

¹⁰⁸ *Norin*, 2010 WL 2420454, at *8; *Univ. of Rochester v. G.D. Searle & Co.*, 358 F.3d 916, 925 (Fed. Cir. 2004).

¹⁰⁹ See, e.g., *Ex parte Rodriguez*, No. 2008-000693, 2009 WL 3756279, at *23 (B.P.A.I. Oct. 1, 2009).

¹¹⁰ *Ex parte Waldmann*, No. 2011-003005, 2011 WL 2661226, at *1 (B.P.A.I. July 6, 2011). An antibody is a protein that tightly and specifically binds to a target. Typically, the target is another protein, where the protein can be free or where the target protein is attached to the outside of a living cell. See, e.g., H. Metzger & J.P. Kinet, *How Antibodies Work: Focus on Fc Receptors*, 2 FED’N AM. SOCIETIES FOR EXPERIMENTAL BIOLOGY J. 3, 3–11 (1988); Tom Brody, *Multistep Denaturation and Hierarchy of Disulfide Bond Cleavage of a Monoclonal Antibody*, 247 ANALYTICAL BIOCHEMISTRY 247, 247–56 (1997).

¹¹¹ *Waldmann*, No. 2011-003005, 2011 WL 2661226, at *1 (B.P.A.I. July 6, 2011).

¹¹² *Id.* at *6.

¹¹³ *Ariad Pharm., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1353 (Fed. Cir. 2010).

¹¹⁴ *Univ. of Rochester v. G.D. Searle & Co.*, 358 F.3d 916, 926 (Fed. Cir. 2004).

C. Best Case Scenario

Where a claim is rejected in view of the prior art, and where it is alleged that the prior art discloses all of the structural elements and also all of the functional elements, the best-case scenario is when the inventor succeeds in arguing that the prior art fails to disclose all of these elements. The cited cases are representative examples of opinions where the inventor succeeded in persuading the Board that the cited prior art failed to disclose the functional element. In arriving at a holding in these particular opinions, the Board typically writes that the examiner “has failed to provide sufficient evidence or scientific reasoning” that the cited prior art is capable of performing the same function as the function possessed by the claimed device.¹¹⁵ To provide a concrete example, in holding that the examiner had failed to meet the prima facie burden regarding the prior art’s ability to perform a function required by the claim, the Board wrote that, “the examiner has not even attempted much less succeeded in establishing that Allred’s safety device [the prior art] is capable of being attached to a ladder . . . in the manner required by the . . . claims.”¹¹⁶

VI. COMPOUND NOUNS.

Functional elements can take the form of a compound noun, where the compound noun includes a structural element and a functional element. Compound nouns¹¹⁷ that contain both a structural element and a functional element are common in patent claims. Claim elements that are compound nouns are construed by techniques used for construing typical functional elements. Compound nouns resist invalidation by the prior art more than claim elements that are merely structural

¹¹⁵ *Ex parte* Becker, No. 2010-004730, 2012 WL 1424845, at *2 (B.P.A.I. Apr. 22, 2012); *Ex parte* Christ, No. 2010-005928, 2012 WL 4483343, at *3 (B.P.A.I. Sept. 18, 2012); *Ex parte* Ciancimino & Moreira, No. 2009-012280, 2012 WL 2513947, at *3 (B.P.A.I. June 21, 2011); *Ex parte* Dewey, No. 2010-006525, 2011 WL 3666742, at *2–3 (B.P.A.I. Aug. 18, 2011); *Ex parte* Dronzek, Jr., No. 2010-001371, 2010 WL 4789644, at *2 (B.P.A.I. Nov. 23, 2010); *Ex parte* Eckhardt, No. 2011-009019, 2012 WL 4955443, at *2 (B.P.A.I. Oct. 15, 2012); *Ex parte* Fischer, No. 2010-005516, 2012 WL 3903344, at *2 (B.P.A.I. Sept. 6, 2012); *Ex parte* Field & Pouliot, No. 2009-015300, 2011 WL 1341753, at *2 (Apr. 6, 2011); *Ex parte* Gottis, No. 2001-0008, 2002 WL 31234500, at *4 (B.P.A.I. Jan. 16, 2002); *Ex parte* Grilliot & Grilliot, No. 2010-005532, 2012 WL 4483273, at *2 (B.P.A.I. Sept. 17, 2012); *Ex parte* Hagan, No. 2009-009157, 2011 WL 121765, at *4 (B.P.A.I. Jan. 12, 2011); *Ex parte* He & Harwell, No. 2011-005552, 2011 WL 2693009, at *4 (B.P.A.I. July 5, 2011); *Ex parte* Louw, No. 2010-006062, 2012 WL 2406017, at *4 (B.P.A.I. June 22, 2012); *Ex parte* McCarthy, No. 2009-013718, 2011 WL 2658869, at *3 (B.P.A.I. July 5, 2011); *Ex parte* McCrory, No. 2010-003076, 2012 WL 424124, at *3 (B.P.A.I. Feb. 8, 2012); *Ex parte* Paquette, No. 2010-010075, 2011 WL 1303798, at *4 (B.P.A.I. Apr. 4, 2011); *Ex parte* Rickerd, No. 2010-007223, 2012 WL 2486786, at *3 (B.P.A.I. June 27, 2012); *Ex parte* Siess & Penners, No. 2009-015015, 2011 WL 1661482, at *2 (B.P.A.I. Apr. 2, 2011); *Ex parte* Soika & Arich, No. 2010-002671, 2011 WL 4894095, at *2 (B.P.A.I. Sept. 28, 2011); *Ex parte* Sommerfeld & Schadt III, No. 95-3734, 1995 WL 1693067, at *3 (B.P.A.I. Aug. 24, 1998); *Ex parte* Spinelli & Rastegar, No. 2009-010380, 2011 WL 1631152, at *2 (B.P.A.I. Apr. 26, 2011); *Ex parte* Streuer, No. 2009-013528, 2010 WL 4264565, at *3 (B.P.A.I. Oct. 28, 2010); *Ex parte* Tonev, No. 2011-006444, 2012 WL 2165994, at *4 (B.P.A.I. June 12, 2012); *Ex parte* Zheng, No. 2010-003543, 2011 WL 4352741, at *3 (B.P.A.I. Sept. 9, 2011).

¹¹⁶ *Ex parte* Bamber, No. 2005-2435, 2005 WL 4779414, at *3 (B.P.A.I. Oct. 13, 2005).

¹¹⁷ THE CHICAGO MANUAL OF STYLE ¶ 5.91 (16th ed. 2010) [hereinafter CHICAGO MANUAL].

elements, because they also require that the prior art literally or inherently disclose the function.

Examples of compound nouns that contain a functional element in combination with a structural element are suture wing,¹¹⁸ projectile entry sheet,¹¹⁹ latch press,¹²⁰ liquid impingement orifices,¹²¹ leaving group,¹²² anchor member,¹²³ closing spring,¹²⁴ planarization layer,¹²⁵ primer sequence,¹²⁶ membrane eraser,¹²⁷ permanent wall,¹²⁸ chemical vapor deposition apparatus,¹²⁹ topical composition,¹³⁰ attachment device,¹³¹ shipping container,¹³² anti-icing composition,¹³³ and bee smoker.¹³⁴ In “suture wing,” the structure is wing and the function that is required of the wing is that it sutures.¹³⁵ In “latch press,” the structure is latch and the function is to press.¹³⁶ In “planarization layer” the structure is layer and the function is planarization.¹³⁷ In “primer sequence,” the structure is sequence and where this sequence must possess the function of being a primer.¹³⁸ In “bee smoker,” the structure is a smoker where the functional term (“bee”) requires that the smoker be configured for smoking bees.¹³⁹

¹¹⁸ *Ex parte* DiMatteo, No. 2009-009433, 2010 WL 4340291, at *1 (B.P.A.I. Nov. 1, 2010).

¹¹⁹ *Ex parte* Hunn, No. 2008-4571, 2008 WL 6678024, at *1 (B.P.A.I. Nov. 21, 2008).

¹²⁰ *Ex parte* Iy, No. 2009-003280, 2009 WL 2575680, at *1 (B.P.A.I. Aug. 17, 2009).

¹²¹ *Ex parte* Micheli, No. 2008-2641, 2008 WL 4338023, at *4 (B.P.A.I. Sept. 22, 2008). The Board explained the separate functional component and structural component of the hybrid functional element, “We conclude that the limitation ‘liquid impingement orifices’ is functional to the extent that it requires that the orifices be capable of directing liquid so as to impinge on other such liquid or an obstacle.” *Id.*

¹²² *Ex parte* Kool, No. 2008-2113, 2008 WL 2389796, at *1 (B.P.A.I. June 11, 2008).

¹²³ *Ex parte* Dingman, No. 2009-013673, 2010 WL 2505308, at *1 (B.P.A.I. June 18, 2010).

¹²⁴ *Ex parte* Rodriguez & Smith, No. 2009-012248, 2011 WL 3871985, at *1 (B.P.A.I. Aug. 29, 2011).

¹²⁵ *Ex parte* Doan, No. 2008-1034, 2008 WL 1929970, at *1 (B.P.A.I. May 2, 2008).

¹²⁶ *Ex parte* Zheng, No. 2009-007969, 2010 WL 674330, at *2 (B.P.A.I. Feb. 23, 2010).

¹²⁷ *Ex parte* Tano, No. 2007-002543, 2009 WL 1796028, at *2 (B.P.A.I. June 22, 2009). The structural word is “eraser.” The required function is, in effect, “configured to erase a membrane.” Although the structural word was eraser in this opinion, it should be apparent that the word “eraser” actually defines a function.

¹²⁸ *Ex parte* Underwood, No. 2009-006791, 2010 WL 3803671, at *1 (B.P.A.I. Sept. 27, 2010).

¹²⁹ *Ex parte* Mardian, No. 2008-2369, 2008 WL 2321841, at *1 (B.P.A.I. June 5, 2008).

¹³⁰ *Ex parte* Student, No. 2010-000438, at *2 (B.P.A.I. Aug. 2, 2011).

¹³¹ *Ex parte* Jordan & Persiani, No. 2009-012302, 2011 WL 2579102, at *1 (B.P.A.I. June 27, 2011).

¹³² *Ex parte* Lamstein, No. 2010-001964, 2011 WL 3380898, at *1 (B.P.A.I. Aug. 1, 2011).

¹³³ *Ice Ban Am., Inc. & Earth Friendly Chems., Inc. v. Patent of Sears Ecological Applications Co., LLC*, No. 2010-009574, 2010 WL 4913983, at *2 (B.P.A.I. Nov. 30, 2010).

¹³⁴ *Ex parte* Younger, No. 2009-002969, 2009 WL 5449462, at *1 (B.P.A.I. Dec. 22, 2009).

¹³⁵ *Ex parte* DiMatteo, No. 2009-009433, 2010 WL 4340291, at *1 (B.P.A.I. Nov. 1, 2010).

¹³⁶ *Ex parte* Iy, No. 2009-003280, 2009 WL 2575680, at *1 (B.P.A.I. Aug. 17, 2009).

¹³⁷ *Ex parte* Doan, No. 2008-1034, 2008 WL 1929970, at *1 (B.P.A.I. May 2, 2008).

¹³⁸ *Ex parte* Zheng, No. 2009-007969, 2010 WL 674330, at *2 (B.P.A.I. Feb. 23, 2010).

¹³⁹ *Younger*, 2009 WL 5449462, at *1.

A. Bizarre conversion of a structural word to a word referring to function, and conversion of a functional word to one that denotes structure.

Please note that compound nouns are potentially confusing, because they might ordinarily be construed as nouns. Please consider the functional element, “bee smoker.”¹⁴⁰ In this example, what is ordinarily considered to be a structure (a bee), is converted into a function, and what is ordinarily be interpreted as a function (smoking) becomes the structure. The potential ambiguity of compound nouns has resulted, in at least one opinion, in the notion that the compound noun should be considered as a whole to be either a structure or a function. The opinion was *Ex parte Fazekas*.¹⁴¹ The functional element was “walking surface.”¹⁴² The inventor argued that the element was not functional.¹⁴³ But the examiner argued that the element was functional.¹⁴⁴ The Board agreed that the writing was functional, writing that “the ‘walking surface’ is defined by the action that can take place on it, walking . . . [t]hus we agree with the Examiner that these limitations are functional.”¹⁴⁵ The Board concluded that the “joist protector” of the cited prior art was capable of being walked upon, and held that the claim was invalid.¹⁴⁶ The holding that “walking surface” is a functional element is consistent with all, or nearly all cases from the Board where the issue was a compound noun.

B. Example of claim construction, where the compound noun is “suture wing.”

Ex parte DiMatteo concerned a claim to a medical device.¹⁴⁷ The compound noun was “suture wing.”¹⁴⁸ The cited prior art was Kovacks. The claim in dispute was as follows.

[Claim] 1. A medical device for percutaneous access to a body comprising: a housing . . . and a first detachable **suture wing** selectively coupleable to the medical device.¹⁴⁹

In contemplating the function of “suture,” the Board wrote that:

The Examiner’s argument that Kovacks’ strap portions are capable of receiving sutures and are therefore suture wings . . . is unpersuasive. The examiner has not provided any scientific evidence or technical reasoning to establish that the method[s] [of Kovacks] . . . are, in fact, penetrable by a surgeon’s suturing instrument. . . . Thus, the examiner has not established

¹⁴⁰ *Id.*

¹⁴¹ *Ex parte Fazekas*, No. 2010-005303, 2012 WL 3766651, at *1 (B.P.A.I. Aug. 24, 2012).

¹⁴² *Id.* at *2.

¹⁴³ *Id.*

¹⁴⁴ *Id.*

¹⁴⁵ *Id.*

¹⁴⁶ *Id.*

¹⁴⁷ *Ex parte DiMatteo*, No. 2009-009433, 2010 WL 4340291, at *1 (B.P.A.I. Nov. 1, 2010).

¹⁴⁸ *Id.*

¹⁴⁹ *Id.*

that the penetrability . . . is a characteristic that necessarily flows from the teachings of the applied prior art.¹⁵⁰

In a nutshell, the Board held that the functional element “suture wing” was successful in maintaining claim validity.¹⁵¹

C. The danger of collapsing both structure and function into one word.

While compound nouns are a shorthand version of a typical functional element, where the function is distinct from the structural element, even more extreme is the case where one word serves as both the structural element and the functional element. Examples include plasticizer, catalyst, anti-oxidant, toaster, stapler, and filter. The danger of using this type of claim element is that the attorney or agent might overlook the fact that it can be anticipated (and rendered invalid) by a wide variety of structures found in the prior art, where anticipation requires only a matching function, and does not require any matching structure. To repeat, the danger of using a compound noun, such as “plasticizer,” is that the compound noun can be anticipated by any chemical in the world that happens to possess the function of plasticizing.

Ex parte Dillenbeck illustrates this danger, where the disputed claim term was “plasticizer.”¹⁵² The claim was rejected because a prior art compound that was a “dispersing agent” was alleged to be capable of performing a plasticizing function.¹⁵³ In rejecting the claim, the examiner observed that certain compounds known as “dispersing agent[s]” had properties and functions that overlapped with those of the plasticizer recited in the claim.¹⁵⁴ This author suggests that instead of using the term “plasticizing agent,” the inventor might have instead used “sulfonic acid-based plasticizer” or “polyacrylate-based plasticizer.”¹⁵⁵ Although these suggested terms are narrower than the term “plasticizer,” they would be expected to confer a greater degree of resistance of the claim to invalidation.

Compound nouns that take the form of only one word have been documented by *The Chicago Manual of Style*.¹⁵⁶ This manual refers to this type of noun as an “adjective-to-noun” transition, where examples include the transition of “collective object” to “collectible,” or the transition of “postmortem examination” to “postmortem.”¹⁵⁷

¹⁵⁰ *Id.* at *2.

¹⁵¹ *Id.* at *3.

¹⁵² *Ex parte Dillenbeck*, No. 2009-004202, 2010 WL 1220239, at *1 (B.P.A.I. Mar. 26, 2010).

¹⁵³ *Id.* at *7.

¹⁵⁴ Examiner’s Answer, U.S. Patent Application No. 11/013,931, at 4 (June 26, 2008).

¹⁵⁵ Specification, U.S. Patent Application No. 11/013,931, at 7 (Dec. 16, 2004).

¹⁵⁶ CHICAGO MANUAL, *supra* note 117, ¶ 5.92.

¹⁵⁷ *Id.*

D. The danger of combining a functional word with a relatively meaningless word that refers to a structure.

Another danger of using a compound noun is the temptation to use a bona fide function in combination with a meaningless word—meaningless in that it requires no particular structure or no particular range of structures. *Ex parte Dingman* provides an example of this danger, where a compound noun (“anchor member”) was used, where the functional word (“anchor”) referred to a genuine function, but the associated word that was intended to confer structure (“member”) actually did not confer any structure at all.¹⁵⁸ Other words that are sometimes used as structural elements, but fail to require any particular structure, are “device,” “element,” “component,” and “structure.”

¹⁵⁸ *Ex parte Dingman*, No. 2009-013673, 2010 WL 2505308, at *1 (B.P.A.I. June 18, 2010).

VII. “ACTIVE-TYPE” VS. “CAPABLE-OF-TYPE.”

The difference between an “active-type” functional element and a “capable of-type” functional element is revealed by the following question. Which is better, to draft a claim reading, e.g., “a device comprising a lever and a gear that sews buttons,” or “a device comprising a lever and a gear that is capable of sewing buttons”?

A. Introduction.

The following is an issue that directly confronts every attorney or agent who takes pen in hand, and begins to draft a claim set. This issue is separately relevant to the maintenance of claim validity (anticipation or obviousness) and to the claim’s ability to encompass infringing activities of competitors. This issue is described by way of a concrete example of a claim to a sewing machine.

The question is, is it better to write the functional element (**bold**) as:

“A device comprising a lever and a gear **that sews buttons,**”

or as:

“A device comprising a lever and a gear **that is capable of sewing buttons**”?

Functional elements using capable of-type language include recitations of “wherein the device is capable of,” “wherein the device is configured for,” and “wherein the device is adapted for.” In contrast, functional elements using active-type language include recitations that the claimed invention “radially compresses,” “inhibits inflammation,” or “resists oxidation,” to give three examples. The context of these three examples is disclosed in Table 1.

Table 1. Claims having active-type functional elements. Functional element shown in bold .		
U.S. Patent	Active-type functional element	Context in claim showing position of active-type functional element
U.S. Pat. No. 8,052,732 issued to Mitchell et al. ¹⁵⁹	“[R]adially compresses” ¹⁶⁰	“[Claim] 15. The delivery system of claim 13 wherein said primary sheath radially compresses said endoprosthesis.” ¹⁶¹
U.S. Pat. No. 6,372,456 issued to Wei et al. ¹⁶²	“[I]nhibits inflammation” ¹⁶³	“[Claim] 148. An isolated polynucleotide comprising a nucleic acid sequence selected from the group consisting of . . . a nucleic acid sequence encoding a fragment of SEQ ID NO:2, wherein said fragment inhibits inflammation .” ¹⁶⁴
U.S. Pat. No. 5,628,617 issued to Dalton et al. ¹⁶⁵	“[R]esists oxidation” ¹⁶⁶	“[Claim] 1. In a steam turbine having a main inlet pipe . . . the improvement which comprises a ring carrier replacing the bell seal, a stack of inner and outer sealing rings loosely sleeved on the ring carrier . . . the inner rings being made from a high strength super alloy which resists oxidation .” ¹⁶⁷

¹⁵⁹ U.S. Patent No. 8,052,732, at [10], [75] (filed Nov. 14, 2006).

¹⁶⁰ *Id.* col.12 l.21.

¹⁶¹ *Id.* col.12 l.20–21.

¹⁶² U.S. Patent No. 6,372,456, at [10], [75] (filed Oct. 23, 1998).

¹⁶³ *Id.* col. 60 l.22.

¹⁶⁴ *Id.* col. 60 l.16–22.

¹⁶⁵ U.S. Patent No. 5,628,617, at [11], [75] (filed Aug. 12, 1996).

¹⁶⁶ *Id.* col.8 l.29.

¹⁶⁷ *Id.* col.8 l.10–36.

Other examples are footnoted, that is, where one claim actually requires reduction of inflammation,¹⁶⁸ while another claim only requires the capability of reducing inflammation.¹⁶⁹

When drafting a claim to a device or to a composition of matter, and when faced with the decision of using active-type language versus capable of-type language, please note that the claim element that uses capable of-type language does not impose any requirement that the device or composition actually perform the function.¹⁷⁰ A claim that uses “capable of”-type language covers devices that have the recited components and which are capable of performing the recited functions.¹⁷¹

The following concerns active-type functional language. Where active-type functional language is used, it is self-evident that this covers infringing devices that actively perform what is described by the claim. But also note that case law from the Board establishes that active-type functional language covers infringing devices that are not being used by any operator. In other words, case law from the Board establishes that active-type functional language covers infringing devices that are merely determined to be capable of performing that function, as established by the cited cases. In all of the cited cases, the prior art references disclosed devices or compositions, but failed to have any literal disclosure that the function was performed. Instead, it was the case that in all of the cited cases, the Board determined that the function was disclosed by inherency. In these opinions, the active-type functional element was found to be anticipated by the inherently disclosed functions.¹⁷²

B. In methods claims, active-type functional language confers greater resistance to prior art rejections.

In method claims, differences in validity analysis materialize, when comparing validity analysis of claims possessing active-type versus claims possessing capable of-type functional elements. The following demonstrates that an active-type functional

¹⁶⁸ U.S. Patent No. 7,888,479, at [10], [75], col.148 l.20–21 (filed Nov. 25, 2003). In the patent, issued to De Fougerolles, claim 43 requires that the claimed composition of matter actually reduces inflammation: “43. An immunoglobulin or antigen-binding fragment of claim 1, which reduces inflammation in a subject.” *Id.* col.148 l.20–21.

¹⁶⁹ U.S. Patent No. 7,060,286, at [10], [75], col.11 l.7–col.8 l.4 (filed Feb. 13, 2004). In the patent, issued to Chung, we find a claim that merely requires that the claimed composition of matter be “capable” of reducing inflammation: “7. An external preparation comprising: oleaginous substances extracted from . . . spores . . . and a cosmetically acceptable carrier . . . wherein said topical formulation is capable of reducing inflammation.” *Id.* col.11 l.7–col.8 l.4.

¹⁷⁰ *Ex parte* Grischenko, No. 2009-001236, 2010 WL 889705, at *3 (B.P.A.I. Mar. 10, 2010).

¹⁷¹ *Ex parte* Aflekt, No. 2007-2815, 2007 WL 2823738, at *2 (B.P.A.I. Sept. 27, 2007).

¹⁷² *Ex parte* Aufderheide & Frank, No. 2007-3175, 2008 WL 752643, at *5 (B.P.A.I. Mar. 20, 2008); *Ex parte* Baker, No. 2006-2892, 2007 WL 630236, at *3 (B.P.A.I. Feb. 26, 2007); *Ex parte* Hougham, No. 2008-2787, 2009 WL 211774, at *6 (B.P.A.I. Jan. 27, 2009); *Ex parte* Kimijima, No. 2009-1994, 2009 WL 1288569, at *5 (B.P.A.I. May 8, 2009); *Ex parte* Kamimura, No. 2009-007132, 2010 WL 4018662, at *2–3 (B.P.A.I. Oct. 12, 2010); *Ex parte* Newman, No. 2008-5922, 2009 WL 803079, at *4–5 (B.P.A.I. Mar. 25, 2009); *Ex parte* Schembri, No. 2008-2978, 2009 WL 492114, at *6 (B.P.A.I. Feb. 25, 2009); *Ex parte* Waldmann, No. 2011-003005, 2011 WL 2661226, at *3 (B.P.A.I. July 6, 2011).

element confers greater resistance to the claim against prior art rejections, than with a capable-of-type functional element. This benefit is possible only in method claims, and not claims to devices.

Ex parte Newton addresses the issue of whether a functional element should be expressed in terms of what the device is capable of, or in terms of what the device actually does.¹⁷³ *Ex parte Newton* concerned two claims, Claim 1 and Claim 15, as shown below.¹⁷⁴ The cited prior art was Sprigg.¹⁷⁵

Claim 1 is a claim to a device, where the claim requires that the device is merely capable of doing something.¹⁷⁶ The capable-of-type language is bolded.

1. A device comprising . . . a storage management unit **for allocating a portion of the local storage arrangement** . . . and referencing the portion with identification information respecting respective access rights.¹⁷⁷

In contrast, Claim 15 is a claim to a method, where the claim requires actually doing the same thing.¹⁷⁸ The active-type language is bolded.

15. A method for managing a local storage arrangement in a device comprising: **allocating a portion of the local storage arrangement** . . . and, including in the portion identification information respecting the access rights.¹⁷⁹

The Board performed separate validity analyses for claim 1 and claim 15, regarding the use of the Sprigg reference to invalidate these claims.¹⁸⁰ The Board observed that “Sprigg’s storage management unit references identifying information . . . [and that] Sprigg’s identifying information is capable of granting access rights.”¹⁸¹ In view of this observation, the Board held that claim 1 was invalid.¹⁸² But regarding claim 15, the Board held that “Sprigg does not actually grant access rights to the software application,” and in view of this, refrained from holding that claim 15 is invalid.¹⁸³

The take-home lesson is that active-type functional language can be more resistant to prior art rejections than capable-of-type functional language, but only for methods claims.¹⁸⁴

¹⁷³ *Ex parte Newton*, No. 2009-010083, 2011 WL 1536023, at *5 (B.P.A.I. Apr. 21, 2011).

¹⁷⁴ *Newton*, 2011 WL 1536023, at *1.

¹⁷⁵ *Id.*

¹⁷⁶ *Id.*

¹⁷⁷ *Id.*

¹⁷⁸ Claims, U.S. Patent Application No. 10/575,412, at 1 (Apr. 10, 2006).

¹⁷⁹ *Id.* at 2.

¹⁸⁰ *Newton*, 2011 WL 1536023, at *2–4.

¹⁸¹ *Id.* at *3.

¹⁸² *Id.* at *4.

¹⁸³ *Id.* at *5.

¹⁸⁴ *Ex parte Laing*, No. 2009-005770, 2010 WL 1170483, at *4 (B.P.A.I. Mar. 25, 2010); *Ex parte Harris*, No. 2007-2377, 2007 WL 5108546, at *4–5 (B.P.A.I. Sept. 19, 2007); *Ex parte Barnhill, Jr.*, No. 2007-3077, 2007 WL 5151254, at *10 (B.P.A.I. Sept. 26, 2007); *Ex parte Hill & Casper*, No. 2009-012902, 2010 WL 3728725, at *6 (B.P.A.I. Sept. 22, 2010); *Ex parte Tarenskeen, Jr.*, No. 2008-

Where active-type functional language is used, this may result in the risk of an indefiniteness rejection, involving allegations that the claim is a mixture of a device claim and method claim. This author recommends using only capable-of-type language, in view of the fact that it unambiguously requires that the associated structure be capable of performing the indicated function, and because it unambiguously avoids suggesting that the structure actually perform that function.

Also, this author recommends avoiding using “capable of” language for some claims, and “active type” language for other claims, because of established case law that holds that when different terms are used in separate claims, they are presumed to have different meanings.¹⁸⁵ This author recommends against drafting a variety of different terms that mean “capable of,” and instead make uniform use of “capable of.”

C. The “impossible standard” for being “capable of” is a strict set-point.

In determining if a prior art reference is capable of performing any given function, it is not particularly relevant if the prior art can perform the function, but only with great difficulty or inconvenience. The only thing relevant is whether it is absolutely impossible that the prior art be capable of performing the function. If it is absolutely impossible, then the prior art cannot be invalidating against the claim.

Ex parte Justis concerned the following claim.¹⁸⁶ The functional element is in bold. The invention was a spinal rod for fusing vertebra in the spine.¹⁸⁷

[Claim] 1. A connector . . . comprising . . . a fastener configured to mate with the receiver to maintain the longitudinal member in the channel, **a force applied by the fastener to maintain the longitudinal rod within the channel.**¹⁸⁸

The claim was rejected for anticipation in view of the Shluzas prior art.¹⁸⁹ The inventor attempted to rebut the rejection, arguing that using the Shluzas device to perform the inventor’s process would be difficult and inconvenient.¹⁹⁰ The inconvenience was that to use the Shluzas disclosure for practicing the claim “would require a patient to be strapped down to an operating table, inverted, and for the connector to be inserted into the patient while the patient is in this orientation.”¹⁹¹

005079, 2010 WL 581985, at *4 (B.P.A.I. Feb. 17, 2010). In *Ex parte Britt*, the opinion stated that “[t]he examiner responds that the billing function recited in the claim is not positively claimed but only requires that the element be able to perform the function.” *Ex parte Britt*, No. 2009-006557, 2010 WL 2070567, at *7 (B.P.A.I. May 21, 2010). Here, the Board clearly distinguishes between the efficacy of “active-type” functional language versus “capable of”-type functional language to resist prior art rejections.

¹⁸⁵ *Comark Commc’ns, Inc. v. Harris Corp.*, 156 F.3d 1182, 1187 (Fed. Cir. 1998); *Aspex Eyewear, Inc. v. Marchon Eyewear, Inc.*, 672 F.3d 1335, 1349 (Fed. Cir. 2012).

¹⁸⁶ *Ex parte Justis & Molz IV*, No. 2010-001025, 2011 WL 3791632, at *1 (B.P.A.I. Aug. 22, 2011).

¹⁸⁷ *Id.*

¹⁸⁸ *Id.*

¹⁸⁹ *Id.* at *2.

¹⁹⁰ *Id.*

¹⁹¹ Appeal Brief, U.S. Patent Application No. 11/341,239, at 7 (May 11, 2009).

The Board affirmed the rejection, writing that “inconvenience alone does not preclude the possibility that the procedure could be performed while the patient is inverted.”¹⁹²

A similar fact pattern is found in *Ex parte Putre*, which involved the following claim:

[Claim] 1. A work stand comprising . . . a collar slidable on said support member . . . and links between said collar and said legs **for displacing said legs between expanded and retracted positions.**¹⁹³

The cited prior art was Dalton, which disclosed a knob, leg assembly, and tripod.¹⁹⁴ The inventor attempted to persuade the Board that Dalton was incapable of performing the function.¹⁹⁵ However, the Board held that Dalton was merely awkward in performing the function, writing, “[f]urther, while it might be awkward for a user to grasp the knob 22 when the leg assemblies are folded due to space constraints, it does not appear to be impossible.”¹⁹⁶ Thus, *Ex parte Putre* provides the “impossible standard” for assessing whether or not the cited prior art is capable of performing the function set forth in the functional element.

The “impossible standard” was also vividly set forth by *Ex parte Cho*, which concerned the functional element “pre-shrunk.”¹⁹⁷ The Board held that any prior art that discloses a structure that is “pre-shrunk” is invalidating prior art, even if the amount of pre-shrunkedness is minimal.¹⁹⁸ In the Board’s words:

[T]he claim encompasses a fabric having properties resulting from any amount of pre-shrinking however minuscule that amount may be. It is reasonable to conclude that the pre-shrunk structure resulting would be the same or substantially the same as the structure of the prior art fabric containing PMP hollow membrane fibers whether shrinking has occurred or not.¹⁹⁹

The take-home lesson is that inventors should not expect arguments relating to difficulty, inconvenience, or awkwardness to be successful in rebutting an inherency-based rejection that is directed against a functional element.

VIII. TECHNIQUES FOR REBUTTING REJECTIONS AGAINST A CLAIM.

The following is a practical guide on rebutting rejections against a claim that has a functional element.

¹⁹² *Justis*, 2011 WL 3791632, at *2.

¹⁹³ *Ex parte Putre*, No. 2008-1701, 2008 WL 3874449, at *1 (B.P.A.I. Aug. 19, 2008).

¹⁹⁴ *Id.* at *2.

¹⁹⁵ *Id.* at *4.

¹⁹⁶ *Id.* at *3.

¹⁹⁷ *Ex parte Cho*, No. 2005-1608, 2005 WL 4773370, at *1 (B.P.A.I. Sept. 22, 2005).

¹⁹⁸ *Id.* at *4.

¹⁹⁹ *Id.* at *3. For a similar fact pattern, see *Ex parte Ericson*, No. 2010-010875, 2012 WL 5982978, at *3 (B.P.A.I. Nov. 26, 2012).

A. Opposite function.

The most dramatic technique for rebutting an allegation that the prior art discloses the same function as that of the claim's functional element is to argue that the prior art discloses the opposite function.

Ex parte Schneider concerned the following.²⁰⁰ The prior art was the Naor patent.²⁰¹ In the claim, the functional element is associated with a structure, where this structure is a "controller."²⁰²

[Claim] 1. A welding-type system comprising: a plasma torch controlled by a trigger and constructed to generate an arc...and a controller **configured to control the air supply...and if arc outage is detected... cause (1) continued air flow through the plasma torch for a predetermined period and (2) then regenerate a pilot arc in the plasma torch.**²⁰³

According to the opinion, "[t]he examiner took the position that the functional limitations of the controller . . . are inherent characteristics of the prior art."²⁰⁴

The inventor pointed out that the Naor prior art disclosure taught the opposite of what was required by the functional element.²⁰⁵ Where an arc outage occurs, the claims require that air continue to flow for a predetermined period, and that after this period the arc be regenerated.²⁰⁶ But in contrast, Naor requires that:

[w]hen an arc outage is sensed . . . controller 109 causes air solenoid 307 to interrupt the air supply and vent the torch...and a pilot arc is reinitiated.²⁰⁷

In the inventor's argument, the inventor identified this part of the Naor patent. The inventor stated that, "[i]t is clear from even a cursory review of Naor . . . that what is called for in claim 1, specifically the continued air flow through the torch, is not anticipated by that which is disclosed in Naor."²⁰⁸ The Board agreed with the inventor, reversed the rejection, and held that the claim was allowable over the prior art.²⁰⁹

²⁰⁰ *Ex parte Schneider*, No. 2008-4677, 2009 WL 191989, at *1 (B.P.A.I. Jan. 26, 2009).

²⁰¹ *Id.*

²⁰² *Id.*

²⁰³ *Id.*

²⁰⁴ *Id.* at *5.

²⁰⁵ *Id.*

²⁰⁶ *Id.*

²⁰⁷ U.S. Patent No. 5,828,030, at [11], [75], col.7, l.11–27.

²⁰⁸ Appeal Brief, U.S. Patent Application No. 10/905,420, at 7 (June 29, 2007).

²⁰⁹ *Schneider*, 2009 WL 191989, at *6.

B. Declaration from an expert.

1. Example of Ex parte Sanocki.

Ex parte Sanocki concerned a catalytic converter.²¹⁰ The cited prior art was Stroom.²¹¹ The disputed claim was as follows. The associated structural element is “insert.”²¹²

[Claim] 1. A pollution control device comprising . . . at least one **resilient, flexible, fibrous non-intumescent** insert.²¹³

The inventor’s goal was to convince the court that Stroom did not disclose a composition that functioned as resilient and flexible.²¹⁴ The inventors submitted a declaration from an expert in ceramic engineering.²¹⁵ The declaration revealed an experiment providing side-by-side laboratory data that compared resiliency of an example (“example 38”) from Stroom with an example of the inventor.²¹⁶ The data in the expert’s declaration distinguished the Stroom reference from Claim 1.²¹⁷ This declaration is an excellent model for attorneys and agents to follow for use in prosecuting patent applications in any technology.

Regarding expert declarations, *Ex parte Lamstein* expressly suggested that inventors submit declarations, where the goal is to persuade the court that a cited prior art reference is not capable of performing the function in question.²¹⁸

2. Example of Ex parte Santos.

Ex parte Santos concerned a pharmaceutical composition that masks a bad-tasting drug that is part of the composition.²¹⁹ The cited prior art was White.²²⁰ The claim was as follows, where the two functional elements are highlighted in **bold**.

[Claim] 1. A taste-masked liquid pharmaceutical composition . . . comprising: at least one **unpleasant tasting** drug;

²¹⁰ *Ex parte Sanocki*, No. 2008-2497, 2008 WL 2553081, at *1 (B.P.A.I. June 25, 2008).

²¹¹ *Id.* at *2.

²¹² *Id.* at *1.

²¹³ *Id.*

²¹⁴ *Id.* at *4.

²¹⁵ *Id.* at *4. Declaration of Gary G. Howorth, U.S. Patent Application No. 10/652,838, at 3–5 (June 21, 2007).

²¹⁶ *Id.* at 3.

²¹⁷ *Id.* at 4–5.

²¹⁸ *Ex parte Lamstein*, No. 2010-001964, 2011 WL 3380898, at *3 (B.P.A.I. Aug. 1, 2011).

²¹⁹ *Ex parte Santos*, No. 2006-0251, 2006 WL 1665493, at *1 (B.P.A.I. Apr. 28, 2006).

²²⁰ *Id.*

polyethylene glycol . . . and polyvinyl pyrrolidone . . . wherein a final form of said **taste-masked** pharmaceutical composition . . . is a liquid.”²²¹

The inventor submitted a declaration from an expert that demonstrated that the cited prior art (White) was not capable of performing the function.²²² The declaration, which was written by a researcher with a Ph.D. in chemical engineering, disclosed the following taste test.²²³ The experiment involved human subjects, where the subjects were asked to drink water and take unsalted crackers between samples to remove traces of the first sample tested.²²⁴ The experiment involved tasting only samples prepared according to the White reference. The result of the tasting test was that a composition made according to White’s example VIII was “unacceptably bitter.”²²⁵ The Board was persuaded by the inventor’s rebuttal, and the Board held that the claims were valid.²²⁶

C. Include a bank of claim limitations in the specification.

Another technique for rebutting rejections against functional elements is to draft a bank of potential claim limitations into the specification. This bank consists of a list of progressively narrowing aspects of the same function.

Where a functional element includes a term, such as “inhibits,” “resists,” “prevents,” “lowers,” “compresses,” “dampens,” “enhances,” or “increases,” or any term that can be characterized by a scientific unit (speed, velocity, density, hardness, etc.), the patent attorney or agent should include a bank of claim limitations in the specification for future use. This bank should take the following form, as shown by way of example: “in alternative embodiments, the present device inhibits oxidation, where inhibition is at least 5%, at least 10%, at least 15%, at least 20%, at least 30%, at least 40%, at least 50%, at least 60%, at least 70%, at least 80%, at least 90%,” and the like. During prosecution, the attorney might find a need to input the limitation “inhibition of at least 60%” into the claim. The existence of this bank enables the attorney to import this limitation to the claims.

Ex parte Bradley provides guidance for enhancing the ability of a functional element to confer resistance of the claim, when faced with a prior art rejection.²²⁷ In *Ex parte Bradley*, the functional element was “sufficient to inhibit oxidation of the fluorescent label.”²²⁸ The examiner rejected the claim, alleging that the chemical reagents and conditions described in the prior art (Rothberg) were sufficient to inhibit this type of oxidation.²²⁹ Please note that “inhibition” is a concept that can be expressed in terms of a unit, where the unit is “percent.”

²²¹ *Id.*

²²² Declaration of Kennie U. Dee, U.S. Patent Application No. 10/017,697, at 3 (Apr. 30, 2004).

²²³ *Id.* at 1, 8.

²²⁴ *Id.* at 8.

²²⁵ *Id.* at 6.

²²⁶ *Santos*, 2006 WL 1665493, at *3–4.

²²⁷ *Ex parte Bradley & Cai*, No. 2008-1184, 2008 WL 2125177, at *7–8 (B.P.A.I. May 19, 2008).

²²⁸ *Id.* at *1.

²²⁹ *Id.* at *2.

The Board affirmed the rejection, writing: “because claim 28 does not recite any particular level of oxidation inhibition, claim 28 encompasses even miniscule levels of inhibition.”²³⁰

But from this opinion, the take-home lesson is that the specification should have included a bank of claim limitations suitable for inputting into the claim element, that is, by way of an amendment following the rejection. This bank could have taken the form of “sufficient to inhibit oxidation by at least 80%,” “sufficient to inhibit oxidation by at least 90%,” “sufficient to inhibit oxidation by at least 95%,” and “sufficient to inhibit oxidation by at least 99%.”

This type of bank of limitations is conventional in the patent drafting art. The patent application in *Ex parte Bradley*²³¹ did contain banks of progressively narrowing limitations, where these banks concern parameters such as temperature, concentration of reagents, molecular weight, ranges of viscosity, ability to inhibit oxidation, and so on. But there was no bank of limitations relating to percent inhibition. The take-home lesson is that every functional element drafted into the claim set should have a corresponding bank of progressively narrowing limitations, drafted into the specification before submitting the patent application to the Patent Office.

D. Arguments that a functional element is really a structural element, or that a structural element is really a functional element.

Where it is alleged that a particular claim element is functional, and if it is to the inventor’s advantage to argue that the element is really structural, the inventor should explore avenues for drafting and submitting this type of argument. The cited cases list most if not all of the cases where the Board’s opinion contained inventor’s arguments that an element that was allegedly a functional element was really a structural element.²³²

Ex parte Krause concerned a claim to an apparatus for use with a mixing bag, where the apparatus included the mixing bag.²³³ The functional element related to the direction of impeller that moved around in the bag.²³⁴ The claim in question was as follows:

²³⁰ *Id.* at *7.

²³¹ *Id.*; Specification, U.S. Patent Application No. 10/207,440, at 6 (July 26, 2002).

²³² *Ex parte Perez-Cruet*, No. 2010-007447, 2012 WL 32279, at *5 (B.P.A.I. Jan. 3, 2012); *Ex parte Sauer*, No. 2011-010199, 2012 WL 4042827, at *3 (B.P.A.I. Sept. 7, 2012); *Tempo Lighting v. Patent of Tivoli LLC*, No. 2011-012102, 2012 WL 627809, at *9 (B.P.A.I. Feb. 24, 2012); *Ex parte Bemis*, No. 2006-2036, 2006 WL 2786857, at *2 (B.P.A.I. Sept. 25, 2006); *Ex parte Fazekas*, No. 2010-005303, 2012 WL 3766651, at *2–3 (B.P.A.I. Aug. 24, 2012); *Ex parte Johnson*, No. 2010-005357, 2011 WL 5013824, at *2 (B.P.A.I. Oct. 17, 2011); *Ex parte Lipscomb*, No. 2009-004292, 2009 WL 3165389, *4–5 (Oct. 2, 2009); *Ex parte Ota*, No. 2009-005055, 2010 WL 676165, at *2 (B.P.A.I. Feb. 24, 2010); *Ex parte Piepgras*, No. 2009-010531, 2011 WL 1576586, at *4 (Apr. 25, 2011); *Ex parte Shaw*, No. 2010-003526, 2011 WL 4009524, at *3 (B.P.A.I. Aug. 31, 2011); *Ex parte Stadelhofer*, No. 2009-008536, 2010 WL 4018666, at *2 (B.P.A.I. Oct. 12, 2010); *Ex parte Underwood*, No. 2009-006791, 2010 WL 3803671, at *3 (B.P.A.I. Sept. 28, 2010).

²³³ *Ex parte Krause*, No. 2009-0371, 2009 WL 537183, at *1 (B.P.A.I. Mar. 3, 2009).

²³⁴ *Id.*

[Claim] 4. An apparatus for mixing fluid, comprising: a mixing bag formed of a flexible material, an impeller connected to a shaft within the mixing bag, wherein a portion of the shaft **traverses the mixing bag . . . opposite a . . . base portion of the mixing bag.**²³⁵

In an attempt at arguing that the prior art (Bibbo) was distinguished from the claims, the inventor provided a drawing of the claimed device, showing a long mixing shaft reaching from the top all the way down to the bottom of the bag (for mixing the base portion), and a drawing of the Bibbo device, showing a short shaft coming out from the bottom of the bag (for mixing the base portion).²³⁶ In viewing the dictionary definition of the word, “traverses” (the functional element in the claim contains this word), it is apparent that “traverses” compels a particular structure.²³⁷ The dictionary definition of “traverses” means *moving all the way across*.²³⁸ To repeat, the word “traverses” mandates a particular dimension to the shaft, with respect to the mixing bag.

The inventor argued that “[t]his claim limitation is devoid of intended-use or method-of-use language, and only defines a location of a physical structure. Therefore, the limitation should be afforded patentable weight for differentiating [the inventor’s] Claims from the prior art.”²³⁹

Although the inventor’s argument in *Ex parte Krause* did not succeed,²⁴⁰ this case is an excellent teaching example of how to argue that an alleged functional element is really structural.

Similarly, *Ex parte Cho* discloses the fact-pattern where the inventor argued that one particular claim element was structural, but where the Board held that the element was a functional element.²⁴¹ The claim contained the phrase, “pre-shrunk microporous membrane fabric.”²⁴² The disputed claim element was “pre-shrunk.”²⁴³ This element, which the examiner argued was functional, was associated with the structure, “microporous membrane fabric.”²⁴⁴ This author points out that “pre-shrunk” can be characterized as functional, because it refers the function of the fabric as being resistant to further shrinking. On the other hand, this author also points out that “pre-shrunk” is structural, because the term refers to a dimension, that is, a size dimension, and because any “pre-shrunk” fabric is likely to have a unique footprint when viewed by electron microscopy.

The inventor argued that “pre-shrunk” was a structural element, because the prior art documents that were cited in the rejection failed to disclose the term “pre-shrunk.”²⁴⁵ Unfortunately, the inventor’s arguments were totally conclusory. The

²³⁵ *Id.*

²³⁶ *Id.*; Appellant’s Reply Brief, U.S. Patent Application No. 10/838,576, at 5 (Feb. 25, 2008) [hereinafter 10/838,576 Reply Brief].

²³⁷ MERRIAM-WEBSTER’S COLLEGIATE DICTIONARY 1332 (11th ed.).

²³⁸ *Id.*

²³⁹ 10/838,576 Reply Brief, *supra* note 236, at 7.

²⁴⁰ *Krause*, 2009 WL 537183, at *4.

²⁴¹ *Ex parte Cho*, No. 2005-1608, 2005 WL 4773370, at *2 (B.P.A.I. Sept. 22, 2005).

²⁴² *Id.* at *1.

²⁴³ *Id.*

²⁴⁴ *Id.*

²⁴⁵ *Id.* at *2, *4.

inventor failed to argue that “pre-shrunk” mandated a particular dimension. The conclusory argument was “pre-shrunk is a structural limitation describing the microporous membrane fabric of the instant invention.”²⁴⁶

The Board took the following approach for determining if “pre-shrunk” is functional or structural. Established case law holds that the court must explore the specification of the patent for guidance on the meaning of claim terms.²⁴⁷ The Board explored the specification for guidance on the meaning of “pre-shrunk,” and found the following writing: “a preferred method of preshrinking and stabilizing the fabric is to heat the fabric to about 15°C above the expected operating temperature for approximately 2 to 8 hours.”²⁴⁸ In view of this functional characterization, the Board found that it related to the function of heating a fabric, and reasonably concluded that “pre-shrunk” is a functional element.²⁴⁹ In holding that the term “pre-shrunk” was functional, the Board observed that the cited prior art disclosed a structure that corresponded to the claim, and affirmed the rejection of the claim.²⁵⁰

Ex parte Hall is another case where the examiner argued that a word (“lid”) was functional, while the inventor argued that the same word (“lid”) was structural.²⁵¹ In this case, the Board dispensed with the conventional structural definition of the word “lid” and, in assessing the anticipation by the prior art, only took into account the functional aspects of this word.²⁵² The prior art was U.S. Pat. No. 571,349 issued to Farquhar, “Combined Dough-Board and Bread-Cutting Tray,” dating from 1896.²⁵³ The inventor fruitlessly argued that the prior art device is not a lid, and pointed out that dictionaries define a “lid” as a moveable cover for opening a hollow container, and that the Farquhar patent does not disclose any container.²⁵⁴ Nevertheless, the Board held that the Farquhar device was capable of functioning as a lid.²⁵⁵ The result is that the claim was rendered invalid.²⁵⁶ This holding of invalidity stemmed from the Board’s refusal to accept the conventional use of the word “lid” as referring to a structure.²⁵⁷ This case illustrates the danger of allowing an adverse party to argue that a particular element is functional.

Ex parte Johnson is similar to *Ex parte Hall* in that it provides the fact pattern where the examiner argued that the structural features of a word (“pore”) did not exist, and that the meaning of the word “pore” was only the function of a pore.²⁵⁸ However, the Board restored the structural meaning of the word “pore,” where this

²⁴⁶ Appeal Brief, U.S. Patent Application No. 10/424,327, at 11 (Dec. 9, 2004).

²⁴⁷ Brody, *Contexts of Implication*, *supra* note 9, at *3; *Hockerson-Halberstadt, Inc. v. Avia Group Int’l, Ltd.*, 222 F.3d 951, 955 (Fed. Cir. 2000).

²⁴⁸ *Cho*, 2005 WL 4773370, at *2.

²⁴⁹ *Id.*

²⁵⁰ *Id.* at *4.

²⁵¹ *Ex parte Hall*, No. 2011-012859, 2011 WL 5080234, at *5 (B.P.A.I. Oct. 22, 2011).

²⁵² *Id.* at *4.

²⁵³ *Id.* at *2; U.S. Patent No. 571,349.

²⁵⁴ *Hall*, 2011 WL 5080234, at *2–3.

²⁵⁵ *Id.* at *4.

²⁵⁶ *Id.* at *5.

²⁵⁷ *Id.* In this author’s opinion, the inventor should have submitted a Declaration under 37 CFR § 1.132 regarding the definition of “lid” according to one skilled in the art.

²⁵⁸ *Ex parte Johnson*, No. 2009-004294, 2009 WL 3044472, at *4 (B.P.A.I. Sept. 22, 2009).

restoration was based on the Board's reference to the meaning that was understood by the skilled artisan.²⁵⁹

The Federal Circuit in *Acco Brands, Inc. v. Micro Security Devices, Inc.* also addressed the issue of whether a particular element was structural or functional.²⁶⁰ In this opinion, if the element was structural, the claim would be broader in scope, but if functional, the claim would have narrower scope.²⁶¹ This case is on point to a recurring problem in patent prosecution, namely the meaning of the word "when." *Acco Brands* provides the warning that where "when" refers to a specific moment in time, the element is functional, but where "when" refers to the ongoing status of a device, the element is structural.²⁶² The court followed the conventional hierarchy of claim construction, reviewed the specification for guidance, and held that "when" referred to a specific moment in time, and that the element was functional.²⁶³

To conclude, an attorney or agent might consider scrutinizing the draft claims, and replacing words that could be construed as either structural or functional (e.g. "traverses" or "pre-shrunk") with words that can only be interpreted as structural.

In general, functional elements place a claim at greater risk to invalidation from prior art references in technologies that are remote from that of the claim, and also place a claim at greater risk for inherency-based rejections under *In re Schreiber*.²⁶⁴ Functional elements may be more susceptible to rejections, in view of *In re Schreiber*,²⁶⁵ which can shift the burden to the inventor to prove the cited prior art is incapable of performing the function.

E. Impermissible hindsight.

Impermissible hindsight, also known as "hindsight reconstruction," has a basis in, for example, *Graham v. John Deere Co.*,²⁶⁶ *W.L. Gore and Associates, Inc. v. Garlock, Inc.*,²⁶⁷ *In re Fritch*,²⁶⁸ and *In re Wesslau*.²⁶⁹ The term "hindsight" means that, in imposing an obviousness rejection, the examiner had made excessive use of the inventor's patent application as instruction manual or template for seeking out the prior art, or for picking and choosing elements from within one particular prior

²⁵⁹ *Id.*

²⁶⁰ *Acco Brands, Inc. v. Micro Sec. Devices, Inc.*, 346 F.3d 1075, 1077 (Fed. Cir. 2003).

²⁶¹ *Id.* at 1080.

²⁶² *Id.* at 1078.

²⁶³ *Id.* at 1079; Brody, *Contexts of Implication*, *supra* note 9, Table 1.

²⁶⁴ *In re Schreiber*, 128 F.3d 1473, 1479 (Fed. Cir. 1997).

²⁶⁵ *Id.* at 1478. *In re Schreiber* concerns validity analysis—that is, anticipation analysis and obviousness analysis. More specifically, this case sets forth a rule for burden shifting during inherency analysis. The burden is as follows: where an adverse party alleges that the cited prior art inherency discloses a function, that is, a function that is the same as that recited in the claim's functional element, the burden shifts to the inventor. *Id.* When this happens, the inventor's burden is to demonstrate that the prior art cannot perform that function. *Id.*

²⁶⁶ *Graham v. John Deere Co.*, 383 U.S. 1, 36 (1966).

²⁶⁷ *W.L. Gore & Assocs., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1553 (Fed. Cir. 1983).

²⁶⁸ *In re Fritch*, 972 F.2d 1260, 1266 (Fed. Cir. 1992).

²⁶⁹ *Application of Wesslau*, 353 F.2d 238, 241 (C.C.P.A. 1965).

art reference.²⁷⁰ In other words, the Patent Office Boards (the P.T.A.B. and the B.P.A.I.) have complained that an examiner's rejections made use of impermissible hindsight in selecting the prior art references from the prior art, and have also complained that the examiner had used impermissible hindsight to select structures from different examples that are all disclosed in one particular prior art reference.²⁷¹

"Impermissible hindsight" is frequently used by the Patent Office and the Federal Circuit as a basis for reversing obviousness rejections. The Board has observed that a bright-line rule for impermissible hindsight has not been provided by the Federal Circuit, writing that, "[w]e are cognizant that our reviewing courts have not established a bright-line test for hindsight."²⁷² Inspired by this failure, the author reviewed about 500 cases from the Board, and detected the following categories of impermissible hindsight. The author selected these 500 cases because the Board had invoked "impermissible hindsight" and that, as a consequence, reversed the examiner's obviousness rejection. The categories include the following:

(1) **Unneeded advantage.** Where the secondary reference disclosed an advantage, but where none of the cited prior art references suggested that the primary reference could benefit from that advantage or was in need of that advantage.²⁷³

(2) **Redundant advantage.** Where the secondary reference disclosed an advantage, and where the primary reference already possessed that advantage.²⁷⁴

(3) **Disparity.** Where the primary reference and secondary reference were disparate from each other; for example, where the primary reference was a golf club and the secondary reference was an underwater observatory,²⁷⁵ or where the primary reference was a baby bottle and the secondary reference was an industrial gas tank.²⁷⁶

(4) **Context.** Where a structure that was provided by the device of the secondary reference resided in a context that was dramatically different from the context of the device of the primary reference.²⁷⁷

²⁷⁰ *W.L. Gore*, 721 F.2d at 1553.

²⁷¹ *Id.*

²⁷² *Ex parte Kastelewicz & Kim*, No. 2008-004808, 2009 WL 1719394, at *6 (B.P.A.I. June 9, 2009).

²⁷³ See, e.g., *Ex parte Saiki*, No. 2000-0373, 2002 WL 32102452, at *3 (B.P.A.I. Jan. 17, 2002); *Ex parte Burak*, No. 2004-0823, 2004 WL 4981768, at *4 (Dec. 8, 2004).

²⁷⁴ See, e.g., *Ex parte Anttila & Jung*, No. 2010-006328, 2012 WL 4718520, at *3 (B.P.A.I. Sept. 27, 2012); *Kastelewicz*, 2009 WL 1719394, at *5-7; *Ex parte Levine*, No. 2010-001240, 2012 WL 4483329, at *3 (B.P.A.I. Sept. 25, 2012).

²⁷⁵ *Ex parte Miura*, No.2002-1488, 2004 WL 4978591, at *1, *2 (B.P.A.I. Mar. 25, 2004).

²⁷⁶ *Ex parte Michaels*, No. 2006-3175, 2006 WL 4005482, at *1, *2 (B.P.A.I. Dec. 12, 2006).

²⁷⁷ See, e.g., *Ex parte Bian*, No. 2008-3625, 2008 WL 4418282, *4-5 (B.P.A.I. Sept. 29, 2008); *Ex parte Park*, No. 2010-001574, 2012 WL 683692, at *2 (Feb. 28, 2012); *Ex parte Oda & Suzuki*, No. 2011-001399, 2012 WL 889732, at *2 (B.P.A.I. Mar. 5, 2012); *Ex parte Schroeder*, No. 2002-1408, 2002 WL 33948433, at *3 (B.P.A.I. Nov. 26, 2002).

(5) **Selecting.** Where the examiner had used “selection” in picking and choosing elements from the cited prior art references, for example, by selecting from a long list of chemicals.²⁷⁸

(6) **Optimizing.** Where the examiner had invoked routine optimization in arriving at the obviousness rejection.²⁷⁹

(7) **Missing element.** Where not all of the elements required by the claim were disclosed by the combination of the cited references. Most of these opinions concerned missing structural elements, but some concerned a missing functional element. The following table lists nearly all of the opinions where the missing element was a functional element.

(8) **Secondary reference provides a disadvantage to primary reference.** The following establishes the category of impermissible hindsight, where the secondary reference provides a disadvantage to the primary reference. In these obviousness rejections, the primary reference provided all but one of the elements of the claim, and the secondary reference provided the missing element. However, importing the missing element from the device of the secondary reference into the device of the primary reference resulted in a disadvantage to the device of the primary reference. In all of the opinions, the Board compared the references with each other.²⁸⁰

(9) **Non-analogous art.** Rebuttals that argue for non-obviousness because of non-analogous art compare a prior art reference with the claim. In all of the cited cases, the Board characterized the obviousness rejection as based on impermissible hindsight.²⁸¹

²⁷⁸ See, e.g., *Ex parte* Fokken & Reith, No. 2007-1565, 2007 WL 1540195, at *4 (B.P.A.I. May 16, 2007); *Ex parte* Wofford & James, No. 95-4450, 1995 WL 1696890, at *3-4 (B.P.A.I. May 5, 1999); *Ex parte* Miller, No. 2001-0120, 2003 WL 23013167, at *2 (B.P.A.I. Dec. 18, 2002).

²⁷⁹ See, e.g., *Ex parte* Domen & Hara, No. 2010-008469, 2012 WL 3133037, at *2 (B.P.A.I. July 26, 2012); *Ex parte* Botros, No. 2011-012279, 2012 WL 6824032, at *2 (P.T.A.B. Dec. 17, 2012); *Ex parte* Musgrave, No. 2011-009559, 2013 WL 819564, at *8 (P.T.A.B. Feb. 25, 2013); *Ex parte* Ho, No. 1998-1069, 2002 WL 31234516, at *3, *5 (B.P.A.I. Nov. 26, 2001).

²⁸⁰ *Ex parte* Adams, No. 2002-1407 (B.P.A.I. Mar. 9, 2003); *Ex parte* Baiges, No. 2005-1273 (B.P.A.I. July 17, 2005); *Ex parte* Beggs, No. 1996-2341 (B.P.A.I. Aug. 30, 1999); *Ex parte* Bemis, No. 2006-2036 (B.P.A.I. Sept. 24, 2006); *Ex parte* Breiner, No. 2010-011623 (B.P.A.I. Dec. 17, 2012); *Ex parte* Coulton, No. 2004-1298 (B.P.A.I. June 8, 2004); *Ex parte* Gilbert, No. 2002-0352 (March 21, 2002); *Ex parte* Grenier, No. 2011-007921 (B.P.A.I. Dec. 14, 2011); *Ex parte* Guzzardo, No. 2004-1600 (B.P.A.I. Aug. 11, 2004); *Ex parte* Hale, No. 96-2391 (B.P.A.I. Aug. 10, 1997); *Ex parte* Ito, No. 2010-003391 (B.P.A.I. July 24, 2012); *Ex parte* Howard, No. 2009-005947 (B.P.A.I. May 25, 2010); *Ex parte* Korb, No. 2008-006186 (B.P.A.I. June 30, 2009); *Lacks Indus., Inc. v. Hayes Lemmerz Int'l, Inc.*, No. 2010-005186 (B.P.A.I. July 9, 2010); *Ex parte* Lang, No. 2010-000573 (B.P.A.I. Feb. 28, 2012); *Ex parte* Nakamura, No. 2005-1458 (B.P.A.I. Sept. 28, 2005); *Ex parte* Perez, No. 2009-015402 (B.P.A.I. Jan. 20, 2011); *Ex parte* Piorkowski, No. 2010-000592 (B.P.A.I. Sept. 26, 2012); *Ex parte* Shane, No. 2005-1115 (B.P.A.I. July 27, 2005); *Ex parte* Steele, No. 95-0942 (B.P.A.I. July 14, 1997); *Ex parte* Umeda, No. 2005-2408 (B.P.A.I. Nov. 17, 2005); *Ex parte* Zatkulak, No. 2010-007573 (B.P.A.I. June 21, 2012).

²⁸¹ *Ex parte* Ziarno, No. 1997-3968 (B.P.A.I. July 1, 2000) (This case is exemplary, because separately comparing the primary reference with the claim, and also comparing the secondary

Table 2 discloses nearly all of the opinions from the Patent Office relating to missing functional elements, where the Board characterized the rejection as involving impermissible hindsight. To conclude, the Patent Office frequently cites precedential case law regarding impermissible hindsight in the situation where not all of the claim elements are disclosed by the cited prior art. This provides an additional avenue for rebutting obviousness rejections, where the issue was an allegation that the cited prior art disclosed a functional element. The Federal Circuit and its predecessor court have also established that obviousness rejections can be characterized as involving “impermissible hindsight,” in the situation where the cited references fail to disclose one or more of the elements in the claim.²⁸²

Table 2. Functional element of the claim, where the recited function was not disclosed in the cited prior art references, in opinions where the Board held that the rejection was based on impermissible hindsight.	
Opinion	Functional element
<i>Ex parte Schweikhardt</i>	“wicking element” ²⁸³
<i>Ex parte Field</i>	“a squeegee . . . configured to engage the surface.” ²⁸⁴
<i>Ex parte Thomas</i>	“under conditions to promote nitroreductase activity.” ²⁸⁵
<i>Ex parte Gottis</i>	“wherein the coating composition flows and cures at temperatures in the range of

reference with the claim, where each comparison supported the conclusion that non-analogous art had been cited.); *Ex parte Reddy*, No. 2002-2318 (B.P.A.I. Apr. 18, 2004); *Ex parte Feld*, No. 1999-2783 (B.P.A.I. Jan. 24, 2001). This opinion provides a rebuttal that the claim and a reference are from non-analogous art, and a separate rebuttal that the cited references are “disparate” from each other. *Id.* Thus, this opinion is exemplary in that it enables a side-by-side comparison of two doctrines that fall under the umbrella of impermissible hindsight. *Id.*; *Ex parte Lang*, No. 2010-000573 (B.P.A.I. Feb. 28, 2012).

²⁸² *In re Kotzab*, 217 F.3d 1365, 1371–72 (Fed. Cir. 2000); *In re Fritch*, 972 F.2d 1260, 1266 (Fed. Cir. 1992); Application of Marshall, 578 F.2d 301, 304–05 (C.C.P.A. 1978); Application of Rosenberger, 386 F.2d 1015, 1018 (C.C.P.A. 1967).

²⁸³ *Ex parte Schweikhardt*, No. 2010-005319, 2012 WL 760133, at *1 (B.P.A.I. Mar. 6, 2012).

²⁸⁴ *Ex parte Field & Pouliot*, No. 2009-015300, at *1 (B.P.A.I. Apr. 6, 2011).

²⁸⁵ *Ex parte Thomas*, No. 2009-011,263, 2009 WL 3127479, at *1 (B.P.A.I. Sept. 28, 2009).

	about 100°C to about 150°C to a smooth form.” ²⁸⁶
<i>Ex parte Lind</i>	“regions with different coefficients of friction” ²⁸⁷
<i>Ex parte Gonzales</i>	“adjustably movable . . . to create a locking force.” ²⁸⁸
<i>Ex parte Bernaski</i>	“minimize the amount of workpiece coating bridging” ²⁸⁹

²⁸⁶ *Ex parte* Gottis, No. 2001-0008, 2002 WL 31234500, at *1 (Jan. 16, 2002).

²⁸⁷ *Ex parte* Lind, No. 2003-0117, 2004 WL 77362, at *1 (B.P.A.I. July 9, 2003).

²⁸⁸ *Ex parte* Gonzales, No. 2010-006566, 2012 WL 1562605, at *1 (B.P.A.I. Apr. 30, 2012).

²⁸⁹ *Ex parte* Bernaski & Palmieri, No. 2011-006732, 2012 WL 2930138, at *1 (B.P.A.I. July 16, 2012).

<i>Ex parte Laude</i>	“noise is common throughout said noise susceptible circuits” ²⁹⁰
<i>Ex parte Soika</i>	“adapted to prevent removal of said second end from said recess” ²⁹¹
<i>Ex parte Schnoebelen</i>	“presents each uppermost said sheet for . . . grasping between a thumb and fingers” ²⁹²
<i>Ex parte Honma</i>	“for thin film growth” ²⁹³
<i>Ex parte Bemis</i>	“for automatically draining and cleaning” ²⁹⁴
<i>Ex parte Kinross</i>	“having a minimal coefficient of friction for providing operational advantages” ²⁹⁵

F. The trap of Ex parte Hough and Ex parte Hovath.

The following discloses a trap that can result in the drafting of an inappropriate rebuttal to rejection against a claim that has a functional element. By disclosing an incorrect way to rebut the rejection, the following provides guidance for drafting correct rebuttals. In *Ex parte Hough* the claim read as follows.

²⁹⁰ *Ex parte Laude*, No. 1999-1553, 2003 WL 21280019, at *1 (B.P.A.I. Sept. 24, 2001).

²⁹¹ *Ex parte Soika & Arich*, No. 2010-002671, 2011 WL 4894095, at *1 (B.P.A.I. Sept. 28, 2011).

²⁹² *Ex parte Schnoebelen, Jr.*, No. 2012-000090, 2013 WL 663569, at *2 (P.T.A.B. Feb. 21, 2013).

²⁹³ *Ex parte Honma & Arai*, No. 2002-1640, 2003 WL 25283764, at *1 (B.P.A.I. Mar. 6, 2003)

²⁹⁴ *Ex parte Bemis*, No. 96-2270, 1996 WL 1749167, at *1 (B.P.A.I. Dec. 9, 1997).

²⁹⁵ *Ex parte Kinross*, No. 2010-001194, 2012 WL 1493776, at *1 (B.P.A.I. Apr. 26, 2012).

[Claim] 1. A cleaning apparatus . . . comprising . . . a first strip of material . . . wherein the first strip **will vertically compress when drawn through a roller nip and partially vertically decompress when exiting the roller nip.**²⁹⁶

The associated structural element is “first strip.”²⁹⁷ Please notice the existence of a structure (“roller nip”) residing in the functional element. The examiner rejected the claim in view of the Beeson prior art, and the Board affirmed this rejection.²⁹⁸ The inventor fruitlessly argued that “there is no roller nip described [in Beeson] and no vertical decompression beyond a nip for cleaning.”²⁹⁹ In other words, the inventor argued that Beeson does not disclose a roller nip, and that the fact that Beeson does not disclose a roller nip mandates that Beeson cannot be invalidating prior art against the claim.

The Board explained the correct role of functional elements in claims: “the claim language does not positively recite a roller nip. Instead the claim defines a cleaning apparatus for use in a paper handling device which includes a roller nip.”³⁰⁰

Where a functional element includes a short description of a laboratory test, and where this description includes various devices or instruments, it must be realized that the names of these devices and instruments do not have any patentable weight. This trap should be avoided.

Ex parte Horvath discloses the same trap. The claim was as follows:

[Claim] 11. A pull bar screen system, comprising: a screen **for retraction into and extension from a cassette housing.**³⁰¹

The inventor argued that to invalidate the claim, the cited prior art (Tedeschi) must disclose the cassette housing.³⁰² Thus, the inventor argued, “Tedeschi utterly fails to teach the claimed cassette housing.”³⁰³ But the inventor had fallen into a trap. The Board refused the inventor’s argument, writing, “[w]e note that claim 11 does not recite the structure of a cassette housing, but rather claim 11 calls for the screen to have the capability of being retracted into and extended out of a cassette housing.”³⁰⁴ The Board affirmed the rejection.³⁰⁵ *Ex parte Depuy Spine* also illustrates, “*The Hough/Hovath Trap*.” In this opinion, the inventor improperly argued that a structure (“bone anchor”) residing in the functional element had patentable weight.³⁰⁶

²⁹⁶ *Ex parte Hough & Feshazion*, No. 2009-002932, 2009 WL 2203090, at *1–2 (B.P.A.I. July 22, 2009).

²⁹⁷ *Id.* at *2.

²⁹⁸ *Id.* at *5–6.

²⁹⁹ *Id.* at *5; Appellant’s Brief, U.S. Patent Application No. 10/707,470, at 8 (Oct. 22, 2007).

³⁰⁰ *Hough*, 2009 WL 2203090, at *5.

³⁰¹ *Ex parte Horvath*, No. 2009-007735, 2010 WL 4780590, at *1 (B.P.A.I. Nov. 18, 2010).

³⁰² *Id.* at *5.

³⁰³ *Id.*

³⁰⁴ *Id.*

³⁰⁵ *Id.* at *6.

³⁰⁶ *Ex parte Depuy Spine, Inc.*, No. 2009-1700, 2009 WL 887278, at *3–4 (B.P.A.I. Mar. 31, 2009).

G. Inappropriate use a function of a prior art structure to invalidate a structural element in a claim—the trap of In re Robertson.

The trap of *Ex parte Hough* and *Ex parte Hovath*, described above, reveals how a **structural element** that is **nested within a functional element** does not have patentable weight. The following reveals another trap, the trap of *In re Robertson*. The trap of *In re Robertson* teaches that a function disclosed in the prior art, without more, cannot anticipate a structural element in a claim.³⁰⁷

Where a claim element in question is a structural element, a prior art disclosure of a function possessed by that structure is not likely to be relevant to that structural element, where an adverse party's goal is to invalidate the claim.

In re Robertson provides an exemplary fact-pattern. The claims to the **Robertson diaper** were to a diaper having three fasteners.³⁰⁸ The prior art **Wilson diaper** was a diaper that had only two fasteners.³⁰⁹ In an earlier hearing before the Board, the Board had held that the **Wilson diaper** was invalidating prior art against the **Robertson diaper**, in view of the fact that the two fasteners of the Wilson diaper could perform all of the same functions as the three fasteners of the Robertson diaper.³¹⁰

The case was appealed to the Federal Circuit, and the resulting opinion held that the Board had wrongly decided the case.³¹¹ The Federal Circuit held that even though the two fasteners of the Wilson diaper could perform the same function as the three-fastener diaper of Robertson, Wilson was not invalidating prior art.³¹² The take-home lesson is that the disclosure of a function in the cited prior art must not be used to invalidate, by anticipation, a structural element in the claim under review, where the adverse party alleges that the function constitutes a disclosure of that structure.

IX. MALLEABILITY OF FUNCTIONAL ELEMENTS.

The meaning of any given functional element in a claim can be altered, during prosecution, by amending the claim. Typically, where a functional element is amended, it is amended to recite a narrower function. Where the goal, during prosecution, is to narrow the scope of the functional element, the functional element can be changed from one that is broader in scope to one that is narrower in scope. Narrowing amendments are typically made to avoid the prior art. Narrowing amendments are also made to confer enablement to a claim, where a claim element otherwise would be too broad to be patentable.

Claim amendments are not permitted during an appeal, but the meaning of any given functional element can be altered merely by way of arguments, for example, an argument that the examiner's understanding of a functional element was too broad,

³⁰⁷ *In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999).

³⁰⁸ *Id.* at 744.

³⁰⁹ *Id.*

³¹⁰ *Id.* at 745.

³¹¹ *Id.* at 746.

³¹² *Id.* at 745.

and that the true meaning of the functional element must conform to a definition that is found in the specification.³¹³

“Malleability,” in this article, refers to claim amendments, and also to arguments (without any amendment) that contend that a given functional element should be interpreted to have a broader or a narrower meaning.

A. Malleability taking the form of amending the claim to replace a first functional element with a second, narrower functional element.

In the file history of U.S. Pat. No. 7,241,865, the claim initially had a claim reading:

said polypeptide **is capable of inducing chondrocyte re-differentiation.**³¹⁴

The functional element is shown in **bold**. The associated structure is, “polypeptide.”³¹⁵ But the patent examiner rejected the claim, alleging that the claim was not enabled (35 USC § 112).³¹⁶ The examiner alleged that the functional element was complex, involved many factors, that the specification failed to provide guidance on measuring chondrocyte re-differentiation, and that it would require undue experimentation to measure chondrocyte re-differentiation.³¹⁷ In response, the applicant amended the functional element to a simpler form, where the simpler functional element read:

said **polypeptide is capable of inducing chondrocyte proliferation.**³¹⁸

The result was allowance of the claim.³¹⁹

The following concerns a different patent case, which also illustrates malleability. In the file history of U.S. Pat. No. 6,927,056, the claim initially read:

An isolated polynucleotide encoding . . . **a biologically active fragment** of a polypeptide that comprises the amino acid sequence depicted in SEQ ID NO.1.³²⁰

In response to an indefiniteness rejection, the inventor amended the claim to input a narrower functional element.³²¹ The amended claim read as follows. The two functional elements shown in **bold**:

³¹³ Brody, *Contexts of Implication*, *supra* note 9, at *42–43.

³¹⁴ Claims, U.S. Patent Application No. 10/363,937, at 2 (Mar. 4, 2003) (redrafted and shortened from Claim 1 by the author).

³¹⁵ *Id.*

³¹⁶ Non-Final Rejection, U.S. Patent Application No. 10/448,923, at 3 (Mar. 27, 2006).

³¹⁷ *Id.* at 4.

³¹⁸ Amended Claims, U.S. Patent Application No. 10/448,923, at 3 (June 28, 2006).

³¹⁹ U.S. Patent No. 7,241,865 col.650 l.27–29 (filed May 29, 2003).

³²⁰ Amendment, U.S. Patent Application No. 10/363,937, at 3 (Dec. 17, 2004).

An isolated polynucleotide encoding . . . **a biologically active fragment** of the polypeptide that consists of the amino acid sequence depicted in SEQ ID NO: 1, **wherein the fragment has cysteine protease activity**.³²²

The result was allowance of the claim.³²³

The Federal Circuit, in *Monsanto Corp. v. Syngenta Seeds, Inc.*, has also addressed the issue of functional elements that are overly broad, and that fail to satisfy the enablement requirement (35 U.S.C. § 112).³²⁴

B. Malleability taking the form of amending the claim to include a functional element where none previously existed.

The file history of U.S. Pat. No. 7,105,721 is representative of a fact pattern that occurs in about half of all file histories of biotechnology patent applications.³²⁵ This situation is amending a claim to include a functional element where, prior to the amendment, the claim did not contain a functional element.³²⁶ In the file history of U.S. Pat. No. 7,105,721, the inputted functional element was as follows:

“which is useful in antisense inhibition or sense suppression of endogenous delta-12 desaturase activity in a transformed plant.”³²⁷

This functional element applied to the structural element “nucleic acid sequence encoding a plant delta-12 desaturase.”³²⁸ Inputting a functional element by way of an amendment, where no functional element had earlier resided in the claim, represents a type of malleability. The amendment resulted in allowance of the claim.³²⁹

C. Drawings as a basis for amending the functional element in a claim.

To amend a claim, a basis must be found elsewhere in the patent application for the new language that is to be added by way of amendment. Typically, the newly added language is imported from another claim in the claim set, or from the

³²¹ Office Action, U.S. Patent Application No. 10/363,937, at 4 (Sept. 22, 2004). The examiner contended that, “[s]aid definition renders Claim 1 indefinite as the scope of the functions encompassed by the phrase ‘biologically active’ is not clear and, thus, one of skill in the art would not know the metes and bounds of the invention.” *Id.*

³²² U.S. Patent No. 6,927,056 col.191 l.2–9 (filed Sept. 6, 2001).

³²³ *Id.*

³²⁴ *Monsanto Co. v. Syngenta Seeds, Inc.*, 503 F.3d 1352, 1361–62 (Fed. Cir. 2007).

³²⁵ Brody, *Allowance of Genus Claims*, *supra* note 6, at 648, Table 4A.

³²⁶ *Id.*

³²⁷ Amendment and Response to Final Office Action, U.S. Patent Application No. 10/108,795, at 4 (Apr. 5, 2005).

³²⁸ *Id.*

³²⁹ U.S. Patent No. 7,105,721 col.79 l.31–45 (filed Mar. 28, 2002).

specification. Established case law³³⁰ holds that the language added to the claim being amended does not have to match exactly the wording found in the other claim, or found in the specification.

But what about deriving language, for an amendment, from a drawing that resides in the specification? Drawings in patents usually do not contain any words at all.

Ex parte Dart,³³¹ *Ex parte Almada*,³³² and *Ex parte Lee*³³³ disclose the situation where an inventor successfully argued that a drawing served as a basis for new language (structural element) inputted into a claim by way of an amendment. The new language, in these three respective cases, was: “no smaller than a particular size of about 40 microns,” “a ring diameter more than two times a ring width,” and, “a drum connection duct positioned adjacent an exhaust outlet.”³³⁴ Functional elements, when inputted into a claim by way of an amendment, can also find a basis in a drawing, as illustrated by *Ex parte Michelson*.³³⁵ The functional element related to the flexing function of a member, when the member contacts a tissue.³³⁶ The inventor successfully argued that the new language found a basis in the drawings, as revealed by an excerpt from the *Michelson* opinion, revealed in the footnote.³³⁷

To conclude, when an attorney finds it necessary to amend the wording of a functional element, a basis for this can be found in the specification, as well as in drawings.

³³⁰ *Purdue Pharma L.P. v. Faulding, Inc.*, 230 F.3d 1320, 1328 (Fed. Cir. 2000); *Application of Wertheim*, 541 F.2d 257, 270 (C.C.P.A. 1976).

³³¹ *Ex parte Dart & Richmond*, No. 2010-010812, 2011 WL 4545864, at *2–3 (B.P.A.I. Sept. 29, 2011).

³³² *Ex parte Almada*, No. 2008-3862, 2009 WL 789939, at *5 (B.P.A.I. Mar. 23, 2009).

³³³ *Ex parte Lee*, No. 2009-003595, 2009 WL 2904632, at *6 (B.P.A.I. Sept. 9, 2009).

³³⁴ *Id.* at *3; *Dart*, 2011 WL 4545864, at *2; *Almada*, 2009 WL 789939, at *4.

³³⁵ *Ex parte Michelson*, No. 2009-009897, at 22 (B.P.A.I. Dec. 9, 2009).

³³⁶ *Id.* at 21–22.

³³⁷ *Id.* at 21. The Board stated:

The Examiner responded that the requirement the flexible member is at least in part curved or concave when in contact with the tissue ‘does not further limit the structure of the rivet itself’ because Appellant is basing patentability on one specific intended use and one specific location when the device is not limited to use in one specific situation. We disagree with the Examiner’s claim interpretation. Each of the above-identified claims contains language requiring the flexible member to be at least in part curved or concave *when said flexible member is in contact with the tissue*. This language imparts a structural limitation on the rivet in that it requires that the rivet has a flexible member that is made of a material and in a configuration that renders it capable of conforming to the tissue and, in particular, that renders it capable of assuming a specific shape when in contact with the tissue.

Id. (internal citation omitted) (emphasis in original).

D. Malleability taking the form of alternate interpretations of one term.

In *Ex parte Bree*, the issue was the breadth of the meaning of the claim term “hold.”³³⁸ The claim was as follows:

[Claim] 7. A locking actuator system . . . comprising . . . the combination of the link, slot, extending pin, worm gear and worm **hold the manual locking lever in the locked position so that external force on the manual locking lever does not move the manual locking lever.**³³⁹

The examiner’s interpretation of the meaning of the word “hold” was such that the lever could move or wiggle when held in the locking position.³⁴⁰ This interpretation permitted the examiner to impose a rejection in view of the prior art.³⁴¹ But the inventor’s interpretation of the word “hold” was narrower.³⁴² This interpretation was that wiggling cannot occur at all.³⁴³ The Board preferred the narrow interpretation of the functional word, “hold.”³⁴⁴ Thus, the inventor’s argument was a success.³⁴⁵

To conclude, where it is necessary to amend a claim to narrow the scope of a functional element, the attorney or agent should first contemplate whether it is possible to narrow the scope merely by arguing that the definition understood by a person reading the patent’s specification is narrower than the definition understood by the examiner.

X. WEIGHT OF A FUNCTIONAL ELEMENT.

Claim elements of questionable weight fall into the established categories of:

- Recitations of intended use;
- Recitations of a workpiece; and
- Recitation of instructions, numbers, or a database.

Although the first two of these are bona fide functional elements, they are typically dismissed by patent examiners, and sometimes by the Board, as having no patentable weight. Recitations of instructions, numbers, or of a database, are rarely or almost never given patentable weight.³⁴⁶

³³⁸ *Ex parte Bree*, No. 1996-1300, 1996 WL 33140801, at *3 (B.P.A.I. Apr. 9, 2001).

³³⁹ *Id.* at *1–2.

³⁴⁰ *Id.* at *2.

³⁴¹ *Id.*

³⁴² *Id.* at *3.

³⁴³ *Id.* at *4.

³⁴⁴ *Id.*

³⁴⁵ *Id.*

³⁴⁶ *Ex parte Aikens*, No. 2009-006565, 2011 WL 4975869, at *5–6 (B.P.A.I. Oct. 14, 2011); *Ex parte Filippo*, No. 2009-004068, at 14–15 (Apr. 13, 2010); *In re Gulack*, 703 F.2d 1381, 1386–87 (Fed.

On occasion, cases from the Board dismiss functional elements, per se, as not having patentable weight—that is, as being merely an “intended use” with no ability to shield the patent from the invalidating effects of the prior art. Even though functional elements are almost universally used in all technologies, the patentable weight of this type of element continues to be inappropriately questioned in contemporary opinions from the Board. The rudest treatment of functional elements comes from *In re Fuetterer*. The *Fuetterer* opinion went so far as to contemplate (but reject) the possibility that functional language is “expressly condemned by the patent statutes,” and that the possibility that there is a “statutory ban on the use of . . . ‘functional’ language.”³⁴⁷

Recitations of instructions, numbers, or databases do not constitute functional elements, but are mentioned here in order to provide perspective on the issue of what is and what is not a functional element. The best perspective of “patentable weight” can be provided by describing a functional element that is truly weightless, as shown below. “Weightless” means that the element is not capable of distinguishing the invention, as claimed, from the prior art.

A. Example of functional element that truly lacks patentable weight.

As a reference point in this article, *Ex parte Lee* provides a functional element that truly lacks weight.³⁴⁸ This functional element was the word “pharmaceutical,” as it occurred in the term, “pharmaceutical composition.”³⁴⁹ The inventor tried to distinguish the claimed composition from the prior art by arguing that “pharmaceutical” requires sterility and requires that the composition be free of toxins.³⁵⁰ The inventor provided a reasonable and clever argument, in an effort to distance his claimed drug (erythropoietin-binding protein) from the compound disclosed by the Lee prior art.³⁵¹ In short, the inventor pointed out that in Lee, the erythropoietin-binding protein was injected into experimental animals in a form that contained toxins (blue dye and polyacrylamide).³⁵² However, the Board refused this argument primarily on the basis that the specification failed to define “pharmaceutical” as requiring sterility and freedom from toxins.³⁵³ This author also points out that the term “pharmaceutical” cannot mean sterility and cannot exclude toxins, because pharmaceuticals that are vaccines often include live bacteria, and pharmaceuticals that are anti-cancer agents are usually toxins.³⁵⁴ Terms such as

Cir. 1983); *Ex parte Jaehn*, No. 2009-010768, at 13–14 (B.P.A.I. Nov. 24, 2009); *Ex parte Kurz & Reinschke*, No. 2009-006519, 2010 WL 3198430 (B.P.A.I. Aug. 9, 2010); *Ex parte Lewis*, No. 2009-003285, 2009 WL 4062365, at *6 (B.P.A.I. Nov. 20, 2009); *Ex parte Nehls*, No. 2007-1823, 2008 WL 258370, at *4–5 (B.P.A.I. Jan. 28, 2008); *In re Ngai & Lin*, 367 F.3d 1336, 1339 (Fed. Cir. 2004).

³⁴⁷ Application of *Fuetterer*, 319 F.2d 259, 262, 265 (C.C.P.A. 1963).

³⁴⁸ *Ex parte Lee*, No. 2010-007770, 2011 WL 109121, at *2 (B.P.A.I. Jan. 11, 2011).

³⁴⁹ *Id.* at *1.

³⁵⁰ *Id.* at *2.

³⁵¹ *Id.*

³⁵² *Id.*

³⁵³ *Id.* at *3.

³⁵⁴ William R., *Toxicity and Antitumor Effect of Divided Doses of Methotrexate*, 115 ARCHIVES INTERNAL MED. 285, 285 (1965); Peter H. Wiernik, *Phase I Clinical and Pharmacokinetic Study of Taxol*, 47 CANCER RES. 2486, 2486 (1987).

“pharmaceutical composition” or “formulation” can distinguish a composition from the prior art, where the composition in the prior art is generated inside the body (and does not occur in a form that can possibly be administered to a patient). In this case, “pharmaceutical composition” and “formulation” are negative claim limitations, because they exclude certain embodiments, that is, they exclude embodiments that occur inside the body.

Another quasi-functional element is “naturally occurring.” *Ex parte Lal* concerned a claim that read as follows. The quasi-functional element is shown in **bold**:

An isolated polynucleotide encoding . . . a polypeptide comprising a **naturally occurring** amino acid sequence at least 90% identical to the amino acid [sequence] of SEQ ID NO:1.³⁵⁵

The claim was rejected for lack of enablement (35 U.S.C. § 112), because the claimed polynucleotide encompassed many polynucleotides that possessed no particular function.³⁵⁶ Please note that the claim element “naturally occurring” does not imply, suggest, or require any biological function. To provide a concrete example, the skilled artisan will readily understand that “naturally occurring” glucose is exactly the same, in structure and in functional capabilities, as synthetic glucose.

Ex parte Lee and *Ex parte Lal* provide a reference point, or perspective, for assessing all other opinions described in this article, that is, by disclosing the concept of functional elements that truly lack any patentable weight.

B. Cases where both the examiner and the Board improperly dismissed recitation of intended use.

Ex parte Warner illustrates the fact pattern where the Board dismissed the intended use element, without taking the following into consideration.³⁵⁷ The Board failed to consider the argument that the cited prior art was not capable of that intended use. Also, the Board failed to consider the argument that the recitation of intended use could distinguish the claim from the prior art. The claim was as follows, where the intended use is shown in **bold**.

[Claim] 1. A device for opening a frozen or stiff seal formed between a door and a door frame, said device comprising . . . plate portions . . . the device pivots about the central point . . . and force the car door away from an adjacent relationship with the door frame so as to **separate and break the frozen or stiff seal** formed between the door and the door frame.³⁵⁸

³⁵⁵ *Ex parte Lal*, No. 2006-1035, 2006 WL 2710996, at *1 (B.P.A.I. Sept. 18, 2006).

³⁵⁶ *Id.* at *2.

³⁵⁷ *Ex parte Warner*, 2006-1748, 2006 WL 2524303, at *2, *3 (B.P.A.I. Aug. 29, 2006).

³⁵⁸ Appeal Brief, U.S. Patent Application No. 10/728,375, at 11–12 (May 19, 2005) [hereinafter 10/728,375 Appeal Brief].

The examiner rejected the claim, writing that the “limitations regarding the use of the device on a frozen door are merely considered to be intended use of the device and are not accorded patentable weight.”³⁵⁹ The inventor did, in fact, argue that the cited prior art (Sutton) was not able to separate and break a frozen or stiff seal, writing that “the device disclosed in Sutton would be ill-suited for opening frozen doors . . . as the plastic construction [of Sutton] may break as the user attempts to lever the door open.”³⁶⁰

But the Board similarly dismissed the intended use element, writing, “we agree with the examiner that this language pertains to the intended use of the device. . . . A statement of intended use does not qualify or distinguish the structural apparatus claimed over the reference.

C. Cases where examiner dismissed recitation of intended use, but the Board properly assessed the patentable weight of the intended use.

The cited cases document most or all of the cases, to date, where a claim element that recited an “intended use” was dismissed by the examiner, but was properly construed by the Board where the patentable weight was properly assessed.³⁶¹

The following discloses a typical fact pattern where a functional element is dismissed by the examiner as having no patentable weight, and where the Board properly assesses the weight.

Ex parte Takahashi properly stated that “intended use” can lend patentable weight to a claim, where the appropriate approach to claim construction is to determine if the prior art apparatus is capable of performing the intended use.³⁶² In other words, if the prior art *cannot* perform the intended use, the claim element has prevented the prior art from invalidating the claim. Although the following wording was crafted to address the facts of the case, the Board’s words express the general approach to claim construction. The Board wrote that, “the prior art structure meets the claims because the prior art apparatus is capable of performing the intended use.”³⁶³

³⁵⁹ Office Action, U.S. Patent Application No. 10/728,375, at 2 (June 10, 2004).

³⁶⁰ 10/728,375 Appeal Brief, *supra* note 358, at 5.

³⁶¹ *Ex parte* Stengelin & Baaser, No. 2011-004953, 2012 WL 3720951, at *2–3 (B.P.A.I. Aug. 27, 2012); *Ex parte* Betzold & Busacker, No. 2011-011011, 2012 WL 3801747, at *8 (Aug. 28, 2012); *Ex parte* Kent, No. 2010-008673, 2012 WL 3863265, at *4 (B.P.A.I. Aug. 31, 2012); *Ex parte* Quickie, LLC, No. 2012-000944, 2012 WL 2316828, at *3–4 (B.P.A.I. June 15, 2012); *Ex parte* Otis, No. 2009-007406, 2010 WL 4340271, at *2 (B.P.A.I. Nov. 1, 2010); *Ex parte* Kamihara, No. 2010-010642, 2012 WL 1071539, at *2 (B.P.A.I. Mar. 27, 2012); *Ex parte* Hosoi & Okazaki, No. 2010-005212, 2012 WL 889723, at *2–3 (B.P.A.I. Mar. 7, 2012); *Ex parte* Cronley, No. 2009-012643, 2011 WL 2621058, at *3 (B.P.A.I. June 30, 2011); *Ex parte* Ochiai & Ozawa, No. 2010-000856, 2012 WL 2356530, at *2–3 (B.P.A.I. June 12, 2012); *Ex parte* Kraft, No. 2010-003586, 2011 WL 2168571, at *2, *3 (B.P.A.I. May 26, 2011); *Ex parte* Mudge, No. 2010-011847, 2010 WL 4670640, at *4–5 (B.P.A.I. Nov. 16, 2010); *Ex parte* Bemis, No. 96-2270, 1996 WL 1749167, at *1–3 (B.P.A.I. Dec. 10, 1997); *Ex parte* Baiges, No. 2005-1273, 2005 WL 4773323, at *2–3 (B.P.A.I. July 18, 2005); *Ex parte* Schnoebelen, Jr., No. 2012-000090, 2013 WL 663569, at *2–3 (P.T.A.B. Feb. 21, 2013).

³⁶² *Takahashi*, 2004 WL 2733658, at *2.

³⁶³ *Id.*

Similarly, in *Ex parte Jochum*, the examiner refused to consider the patentable weight of the functional element:

with the proviso that said composition is suitable for preparing a temporary dental restorative material.³⁶⁴

The examiner's rationale was that this element was merely a recitation of "intended use."³⁶⁵ The Board reversed the rejection, holding that the functional element describes "indispensable characteristics that must be present in the monomeric components required by the claimed invention."³⁶⁶

In *Ex parte Kormann*, the functional element was as follows:

with the proviso that the relaxivities of the contrast media are such that r_1 is greater than $9 \times 10^4 \text{ M}^{-1}\text{s}^{-1}$.³⁶⁷

In imposing an anticipation rejection, the examiner, in effect, dismissed the weight of the functional element, writing that the cited prior art are "presumed" to contain all of the functional elements.³⁶⁸ In imposing an obviousness rejection, the examiner also, in effect, dismissed the weight of the functional element, writing that "it would have been obvious to those of ordinary skill in the art that minor variations in the relaxivity . . . could be made."³⁶⁹ The Board reversed both rejections, demonstrating that functional elements have *bona fide* patentable weight, and also demonstrating the proper burden for alleging anticipation and obviousness.³⁷⁰

D. Claim construction that uses a strawman.

Several opinions from the Board use a "strawman" approach for claim construction. In this approach, the Board first dismissed recitations of intended use as having no patentable weight. Then, the Board proceeded to assess the patentable weight of the recitation of intended use. The strawman approach to claim construction was used in *Ex parte Jung*. The opinion initially wrote that "[t]he mere recitation of an intended use in a claim will not be given any patentable weight," citing *In re Dense*.³⁷¹ But immediately after this, the opinion analyzed the patentable weight of the functional element, writing, "[n]otwithstanding the proscription against giving patentable weight to statements of intended use," and then held that the functional element distinguished the claim from the prior art.³⁷² Thus, by its own admission, the Board takes the "strawman" approach to claim construction. In the

³⁶⁴ *Ex parte Jochum*, No. 95-1999, 1999 WL 33161329, at *2 (B.P.A.I. Feb. 8, 1999).

³⁶⁵ *Id.*

³⁶⁶ *Id.*

³⁶⁷ *Ex parte Kormann*, No. 1997-2199, 2001 WL 816644, at *1 (B.P.A.I. June 27, 2000).

³⁶⁸ *Id.* at *2.

³⁶⁹ *Id.*

³⁷⁰ *Id.* at *2, *3.

³⁷¹ *Ex parte Jung*, No. 2009-014528, 2010 WL 1725741, at *9 (B.P.A.I. Apr. 27, 2010); *Application of Dense*, 156 F.2d 76, 77 (C.C.P.A. 1946).

³⁷² *Jung*, 2010 WL 1725741, at *9.

strawman approach, the Board cites case law that it never intends to use, and then proceeds to ignore that case law.

Other cases using the strawman approach are cited.³⁷³ This author suggests that the Board refrain from using the strawman approach to claim construction. The strawman approach, which is based on archaic case law such as *In re Sinex*,³⁷⁴ *In re Casey*,³⁷⁵ and *In re Dense*,³⁷⁶ is counterproductive.

E. Summary and conclusions.

To conclude, where an examiner or the Board dismisses a functional element as “intended use,” the inventor’s first goal should be to argue that the recitation of intended use is a genuine functional element. The inventor’s next goals are to argue using one or more of the following approaches:

- The cited prior art fails to expressly disclose the function of that functional element;
- The cited prior art is not capable of performing the same function as that identified in the functional element;
- The cited prior art performs a function that is opposite that which is required by the claim’s functional element;
- The functional element in the claim confers upon the corresponding structural element (in the same claim) a specific type of structure, where this type of structure is not disclosed by the cited prior art reference. For example, the specific type of structure can be constrained by a certain shape, dimension, chemical composition, or relation to other structural elements in the same claim.

F. Workpiece.

“Workpiece” is a category of claim element that is typically found to have no patentable weight. Where a claim identifies a workpiece, the claimed device is described in terms of its relationship with the workpiece, or with a particular environment of use. The workpiece and environment of use have a firmly established role in determining the structures of the structural elements in a claim, according to

³⁷³ *Ex parte* Su & Lin, No. 2010-005722, 2012 WL 3903368, at *5 (B.P.A.I. Aug. 31, 2012); *Ex parte* Henninger III & Bolotine, No. 2010-010605, 2012 WL 5975825, at *8 (P.T.A.B. Nov. 26, 2012); *Ex parte* Ignatiev, No. 2009-011747, 2010 WL 1188327, at *4 (B.P.A.I. Mar. 25, 2010); *Ex parte* Denvir, No. 2009-014463, 2010 WL 3803765, at *4 (B.P.A.I. Sept. 24, 2010); *Ex parte* Addington, No. 2008-0915, 2008 WL 3874418, at *4 (B.P.A.I. Aug. 19, 2008); *Ex parte* Honma & Arai, No. 2002-1640, 2003 WL 25283764, at *4 (Mar. 6, 2003).

³⁷⁴ Application of Sinex, 309 F.2d 488, 492 (C.C.P.A. 1962).

³⁷⁵ Application of Casey, 370 F.2d 576, 580 (C.C.P.A. 1967).

³⁷⁶ *Dense*, 156 F.2d at 77.

Ex parte Nelson.³⁷⁷ The *Ex parte Nelson* opinion admits to the “tremendous difficulty in making sense of apparatus claims whose structure depends on the environment of use.”³⁷⁸

The following discloses the workpieces in various claims. *Ex parte Crenshaw* concerned a claim to a fly swatter, where the workpiece was **a fly**.³⁷⁹ *Ex parte Manser* concerned a claim to a treadmill, where the workpiece was **a person’s foot**.³⁸⁰ *Ex parte Faye* claimed a device that was a fuel cell, where the workpiece identified in the claim was **hydrogen**.³⁸¹ *Ex parte Khan* claimed a conduit where the workpiece was **vapor**.³⁸² In *Ex parte Bogatyrev*, the claimed structure was “an element for arranging,” and the workpiece was **stacks of bank notes**.³⁸³

The inventors were not interested in making, using, or selling flies, human feet, hydrogen, vapor, or stacks of bank notes. These recitations were workpieces which, in a properly drafted claim set, serve the purpose of conferring a particular range of structures on the claimed device, for example, a device that is a fly swatter, a device that is a treadmill, a device that is a fuel cell, or an element for arranging, respectfully.

Often, the Board dismisses a recitation of a workpiece as having no patentable weight. For example, *Ex parte Bergdoll* dismissed workpieces in this way.³⁸⁴ A number of cases from the Federal Circuit and Court of Customs and Patent Appeals also dismiss workpieces, as identified in the footnote.³⁸⁵

In contrast, in the following cases, the Board considered the possibility that the recitation of a workpiece conferred patentability to the claimed device.³⁸⁶

Where the examiner or Board fails to assess patentable weight of a “workpiece,” the attorney or agent should explore the possibility that the workpiece does confer one or more of the following things:

- A specific range of structures or dimensions to any particular structural element;
- A specific range of chemical compositions to any particular structural element; or

³⁷⁷ *Ex parte Nelson & Anderson*, No. 2007-2914, 2007 WL 4162768, at *5 n.2 (B.P.A.I. Nov. 21, 2007).

³⁷⁸ *Id.*

³⁷⁹ *Ex parte Crenshaw*, No. 2008-4083, 2008 WL 6678100, at *1 (B.P.A.I. Nov. 18, 2008).

³⁸⁰ *Ex parte Manser*, No. 2009-005349, 2010 WL 896634, at *1 (B.P.A.I. Mar. 11, 2010).

³⁸¹ *Ex parte Faye*, No. 2007-2553, 2007 WL 2211385, at *1 (B.P.A.I. July 31, 2007).

³⁸² *Ex parte Khan*, No. 2009-004390, 2009 WL 2760731, at *1 (B.P.A.I. Aug. 28, 2009).

³⁸³ *Ex parte Bogatyrev*, No. 2009-002185, 2009 WL 1719562, at *1 (B.P.A.I. June 12, 2009).

³⁸⁴ *Ex parte Bergdoll*, No. 2009-011825, 2011 WL 1100038, at *3 (B.P.A.I. Mar. 23, 2011).

³⁸⁵ Application of Otto, 312 F.2d 937, 941 (C.C.P.A. 1963); Application of Rishoi, 197 F.2d 342, 345 (C.C.P.A. 1952); *In re Young*, 75 F.2d 996, 998 (C.C.P.A. 1935); *In re Smith*, 36 F.2d 302, 303 (C.C.P.A. 1929).

³⁸⁶ *Ex parte Maeda*, No. 2009-011173, 2010 WL 2070573, at *3–4 (B.P.A.I. May 21, 2010); *Ex parte Farris*, No. 2004-1945, 2004 WL 4983402, at *3–4 (B.P.A.I. Sept. 15, 2004); *Khan*, 2009 WL 2760731, at *9; *Ex parte Porro & Sauer*, No. 2008-0184, 2008 WL 2259960, at *5–6 (B.P.A.I. Mar. 11, 2008).

- Any particular relationship between two different structural elements in the same claim.

If the workpiece does, in fact, confer one or more of these things, then the attorney or agent should argue that the workpiece has patentable weight.

XI. FUNCTIONAL ELEMENTS IN BIOTECHNOLOGY.

The following concerns functional elements in biotechnology claims, that is, claims that encompass nucleic acids, polypeptides, or antibodies.

A. Biotechnology claims to nucleic acid sequences and polypeptides.

Ex parte Porro concerned the need for a representative number of species, in the specification, to support a genus claim. The claimed genus was set forth by the language:

encoding L-galactose dehydrogenase (LGDH) enzyme having at least about 90% identity to SEQ ID NO: 11.³⁸⁷

The term “L-galactose dehydrogenase” was the functional element. “LGDH” means “L-galactose dehydrogenase.”³⁸⁸ But more accurately, this term performs double duty by identifying the catalytic activity (catalytic activity is a function, not an object) that is required by each and every one of the species that are encompassed by the claim, and also by identifying the genus of enzymes (an enzyme is an object, not a function) that are able to catalyze that function. The term “at least about 90%” identifies breadth of the genus.³⁸⁹ The Board required a disclosure in the specification of a representative number of species of nucleic acids, where the purpose of this representative number was to satisfy the requirements for patenting a genus of nucleic acids.³⁹⁰

The Board expressly found that the claim was valid under the requirement for enablement (35 U.S.C. § 112), writing, “[g]ranted, those skilled in the art could make libraries of SEQ ID NO: 11 variants and screen them . . . and that have LGDH enzymatic activity.”³⁹¹ *Ex parte Porro* reveals that functional elements are central to assessing the enablement requirement. Thus, it was the case that the specification disclosed an adequate number of species for supporting the claimed genus, and it was the case that the functional element in the claim adequately defined the scope of the claimed genus.

An appropriate counterpoint to *Ex parte Porro* is provided by a case from the Federal Circuit, where the functional element (“sequence which functions in plant

³⁸⁷ *Porro*, 2008 WL 2259960, at *1.

³⁸⁸ *Id.*

³⁸⁹ *Id.*

³⁹⁰ *Id.* at *5.

³⁹¹ *Id.* at *4.

cells”) was held to be too broad, and therefore not enabled.³⁹² Because the functional element was not enabled, the court rendered the claim invalid under 35 U.S.C. § 112.³⁹³

Comprehensive guidance for using functional elements to support broad genus claims are provided by the cited article.³⁹⁴ In particular, this article demonstrates how functional elements ensure satisfaction of the enablement requirement by the genus claim.

B. Biotechnology claims to antibodies.

Where the functional element requires binding of an antibody to a polypeptide, the written description requirement only needs the specification to disclose the amino acid sequence of the entire polypeptide. As illustrated by the following opinion, there is no need to identify the actual specific target epitope within that polypeptide.

Ex parte Dickson concerned a claim to an antibody, where the claim contained a typical functional element (typical to claims to antibodies) requiring binding of the antibody to a specific target protein.³⁹⁵ The functional element was, in effect, “which selectively binds to . . . matriptase.”³⁹⁶ The term “matriptase” is the name of a protein that is the antibody’s target. The claim identified the antibody’s target by the target’s trivial name (not by the chemical structure of the target).³⁹⁷ But this lack of detail was not the issue. The issue was that the examiner had rejected the claim under 35 U.S.C. § 112, alleging that the specification did not have sufficient written description.³⁹⁸ The examiner believed that the detail that was required in the specification was the structural epitope of the target protein.³⁹⁹ Please see the footnote for scientific background.⁴⁰⁰ The Board reversed the rejection under 35 U.S.C. § 112, and held the claim to be valid.⁴⁰¹ Thus, the Board held that validity of the claim only required that the specification identify the amino acid sequence of matriptase (and that there was no requirement to identify the epitope that resided in matriptase).⁴⁰²

³⁹² *Monsanto Co. v. Syngenta Seeds, Inc.*, 503 F.3d 1352, 1361, 1362 (Fed. Cir. 2007).

³⁹³ *Id.* at 1362.

³⁹⁴ Brody, *Allowance of Genus Claims*, *supra* note 6, at 623.

³⁹⁵ *Ex parte Dickson*, No. 2007-4125, 2007 WL 5108541, at *1 (B.P.A.I. Nov. 5, 2007).

³⁹⁶ *Id.*

³⁹⁷ *Id.*

³⁹⁸ *Id.*

³⁹⁹ *Id.* at *3.

⁴⁰⁰ Susan Zolla-Pazner, *Identifying Epitopes of HIV-1 that Induce Protective Antibodies*, 4 NATURE REV. IMMUNOLOGY 199, 199 (2004). Antibodies are proteins. Antibodies contain a region configured for specifically binding to a target. The target can be, for example, a particular protein of an infecting organism such as hepatitis C virus or Salmonella bacterium. When the antibody binds to a particular protein, it is never the case that the antibody binds to all regions of the protein. Instead, it is the case that the antibody binds to a specific part of the protein, called an “epitope.” Epitopes occupy a small proportion of the exposed surface of the target protein, perhaps a few percent of the exposed surface. While the amino acid sequence of any given protein is very easy to determine, it is extremely difficult to determine or identify an epitope that is bound by any given antibody.

⁴⁰¹ *Dickson*, 2007 WL 5108541, at *4.

⁴⁰² *Id.*

To view the big picture, functional elements in antibody claims almost always take the form of a recitation that the claimed genus of antibodies must be capable of binding to a specific target.⁴⁰³

C. Disclosure of laboratory tests for the functional element.

The following cases disclose the value of including, in the specification, a short description of laboratory tests that correspond to each functional element in a claim.

Ex parte Adler provides a powerful and universal lesson, regarding the enablement requirement (35 U.S.C. § 112). The examiner rejected the genus claim for lack of enablement.⁴⁰⁴ But the Board reversed, in view of the fact that the specification disclosed a screening assay that is sensitive for variants, within the claimed genus, that possess the biochemical activity of binding a bitter ligand.⁴⁰⁵

Ex parte Abad provides the same take-home lesson. *Ex parte Abad* concerned a genus claim with the functional element, “which is pesticidal for at least one pest belonging to the order Coleoptera.”⁴⁰⁶ This function was required for each and every one of the species of nucleic acid variants that fell under the umbrella of the genus claim.⁴⁰⁷ The Board held that the enablement requirement for the claimed genus was satisfied, in view of the fact that the specification disclosed a screening test that detected pesticidal activity of each variant protein, an identification of a conserved domain, as well as several species of working examples of variant proteins.⁴⁰⁸ The Board wrote that the screening test allowed scientists to conduct routine screening for discovering working species that belonged to the genus.⁴⁰⁹

A related topic is rejections under 35 U.S.C. § 112, for lack of written description. *Ex parte Rollat-Corvol* discloses the fact pattern where the compositions in the claim consisted in a less detailed structural element and a more detailed functional element.⁴¹⁰ For example, the claim required a “tacky polymer having a glass transition temperature (Tg) of less than 20°C.”⁴¹¹ The examiner rejected the claim, alleging that “the specification provides no written description as to what the structural characteristics of a polymer would be required to meet all the functional limitations.”⁴¹²

⁴⁰³ Brody, *Allowance of Genus Claims*, *supra* note 6, at 651–52.

⁴⁰⁴ *Ex parte Adler*, No. 2006-0157, at 5 (B.P.A.I. Mar. 23, 2006).

⁴⁰⁵ *Id.* at 5–6.

⁴⁰⁶ *Ex parte Abad*, No. 2007-4213, 2008 WL 904456, at *1 (B.P.A.I. Apr. 3, 2008).

⁴⁰⁷ *Id.* at *2–3.

⁴⁰⁸ *Id.* at *8.

⁴⁰⁹ *Id.* at *12.

⁴¹⁰ *Ex parte Rollat-Corvol & Samain*, No. 2009-003513, at 2 (B.P.A.I. Nov. 2, 2009).

⁴¹¹ *Id.* The author notes that “tacky” and “temperature (Tg) of less than 20°C” represent functional elements, while “polymer” represents a structural element.

⁴¹² *Id.* at 3. Fortunately for the inventor, the Board explored the specification and detected a sufficient quantity of structural characteristics, and reversed the rejection.

XII. DISCLOSURES THAT MAY BE INCLUDED IN THE SPECIFICATION FOR DEFENDING AGAINST PRIOR ART REJECTIONS.

The following reveals disclosures, drafted into the specification, that can be of potential use in defending a functional element from prior art rejections.

A. Defending a claim's functional element by including a disclosure of laboratory test results in the specification.

Where an attorney or agent representing a client has a claim set in hand, a prior art search should be conducted. The goal of the prior art search is to identify devices or compositions that are likely to have the same function as that required by the functional element. Once these devices or compositions are identified, the inventor should conduct a side-by-side laboratory experiment to determine if the functions are the same or different. The side-by-side experiment should be designed to compare the preferred embodiment of the inventor, and the closest possible embodiment of the device that is disclosed by the prior art. Where the results of this experiment are available, the attorney or agent will more easily be able to rebut rejections against the claim.

Ex parte Dieu concerned an invention that was a photomask.⁴¹³ The cited prior art was Liang.⁴¹⁴ The Board believed that the cited prior art was capable of the same function and, on the basis of this belief, rejected the claim.⁴¹⁵ The court proclaimed that inventors,

who are in a better position than the PTO to test the operable capabilities of the photomask of Liang, including the capabilities of the buffer layer materials, have not proven that the buffer layer materials described by Liang for use in their photomask do not have the argued characteristics as called for in . . . claim 21.⁴¹⁶

This opinion provides a distinct take-home lesson for all inventors. Inventors need to be ready and willing, preferably before filing the patent application, to conduct side-by-side tests that compare their invention with the device or composition of competitors that is closest to the invention.

⁴¹³ *Ex parte Dieu & Lamantia*, No. 2009-005807, 2011 WL 1100035, at *1 (B.P.A.I. Mar. 23, 2011).

⁴¹⁴ *Id.*

⁴¹⁵ *Id.* at *3.

⁴¹⁶ *Id.*

B. Defending a claim's functional element by examples in the specification that bracket the function of the functional element.

Ex parte Koele provides a technique for resisting inherency-based rejections against a claim that contains a functional element.⁴¹⁷ This technique is to draft your specification so that it discloses a few structures (or devices or compositions) that are capable of performing that function, but also to disclose or identify some structures that cannot perform that function.

Ex parte Koele teaches that inventors should draft patent applications to include parameters that are encompassed by the claim's functional element, as it applies to the preferred embodiment, but also to document parameters that are outside of any preferred embodiment, and that are outside of the umbrella of what is claimed.

Ex parte Koele documents a good patent-drafting technique, where the patent documented parameters that were encompassed by the claim's functional element, as well as parameters outside the claim's functional element. The following concerns functional elements that take the form of a characteristic of a material, such as whether the material is made of ceramic, plastic, or metal. The relevant characteristics of the material may also include, for example, torsion, strain, conductivity, roughness or smoothness, surface friction coefficient, or hydrophobicity.

Ex parte Koele concerned a claim to diapers for infants.⁴¹⁸ The diapers included a laminated material.⁴¹⁹ The claim was as follows.

[Claim] 1. An absorbent article . . . comprising . . . outercover comprising a laminated material including first and second-layers . . . wherein the laminated material **exhibits a Poisson's ratio less than 1.0 at 4 percent longitudinal strain.**⁴²⁰

The prior art cited against the claim was LeMahieu.⁴²¹ It was argued that LeMahieu described a laminated material having the same function as that described in the claim's functional element.⁴²² The inventor took the following tactic in arguing that the LeMahieu laminate does not necessarily (does not inherently) possess the same function.⁴²³ The inventor pointed out that there do exist similar laminates with functional properties that are outside the range identified in the claim.⁴²⁴

The inventor's own patent application did identify a particular laminate that had a Poisson's ratio of more than 1.0 to 4 percent longitudinal strain.⁴²⁵ This argument proved successful in the inventor's argument that the LeMahieu reference did not necessarily possess the function in question.⁴²⁶

⁴¹⁷ *Ex parte Koele*, No. 2009-013675, 2010 WL 2447925, at *2 (B.P.A.I. June 16, 2010).

⁴¹⁸ *Id.* at *1.

⁴¹⁹ *Id.*

⁴²⁰ *Id.*

⁴²¹ *Id.*

⁴²² *Id.*

⁴²³ *Id.*

⁴²⁴ *Id.*

⁴²⁵ *Id.*

⁴²⁶ *Id.* at *1, *2.

The take-home lesson is that attorneys and agents using a functional element in a claim should draft the patent's specification to identify one or more structures that fall under the umbrella of that functional element, and also one or more similar structures that possess a similar function, but where the parameters of that function all outside that of the element in the claim. *Ex parte Rotach* provides the same type of take-home lesson.⁴²⁷

XIII. INDEFINITENESS.

The following identifies various indefiniteness issues that can inflict claims that contain a functional element. In addressing the issue of indefiniteness in functional elements, the Federal Circuit found that any ambiguity depends on the context, for example, the disclosure in the specification and the knowledge of the skilled artisan.⁴²⁸ Also, the Federal Circuit provided the advice that potential ambiguity can be reduced "if the specification provided a formula for calculating a property along with examples that meet the claim limitation [the functional element] and examples that do not."⁴²⁹ Specialized topics on indefiniteness, as provided by cases from the Board, are as follows.

A. *The Newman Paradox of functional elements.*

Ex parte Newman illustrates a paradox that can occur when a claim is rejected for indefiniteness (35 U.S.C. § 112), where the rejection alleged that the wording of a functional element is ambiguous or indefinite.⁴³⁰ The author hereby names this the *Newman Paradox*, because *Ex parte Newman* may be the best example of this particular contradiction.⁴³¹ The situation can be classed as a paradox, because the claim language in question can render a claim less valid, but also render a claim more valid. In detail, the claim language can render the claim invalid for indefiniteness, but render the claim more resistant to prior art rejections (35 U.S.C. § 102; 35 U.S.C. § 103).⁴³² By altering the language to make it less ambiguous, what

⁴²⁷ *Ex parte Rotach*, No. 2007-4414, 2008 WL 1834818, at *7 (B.P.A.I. Apr. 24, 2008).

⁴²⁸ *Halliburton Energy Servs., Inc. v. M-I LLC*, 514 F.3d 1244, 1253–54 (Fed. Cir. 2008).

⁴²⁹ *Halliburton*, 514 F.3d at 1256.

⁴³⁰ *Ex parte Newman & Praechter*, No. 1998-0408, 2002 WL 851849, at *1 (B.P.A.I. Feb. 22, 2001).

⁴³¹ Brody, *Obviousness in Patents*, *supra* note 12, at 56. This author previously discovered and documented another paradox in patent law, which is presently named the Wands-Vaeck Paradox. The Wands-Vaeck Paradox is named after the standard for predictability needed to establish enablement (35 U.S.C. § 112), as set forth by *In re Wands*, and by the standard for predictability needed to reject a claim for obviousness (35 U.S.C. § 103), as set forth by *In re Vaeck*. *In re Wands*, 858 F.2d 731, 737 (Fed. Cir. 1988); *In re Vaeck*, 947 F.2d 488, 493 (Fed. Cir. 1991). The fact-pattern is a paradox, because language that renders a claim more resistant to an enablement rejection at the same time renders the claim more susceptible to an obviousness rejection (and *vice versa*).

⁴³² *Newman*, 2002 WL 851849, at *4.

happens is that the claim becomes more resistant to prior art rejections.⁴³³ The Court of Customs and Patent Appeals, in *Application of David W. Wilson*, commented on the choice between rejecting a claim for obviousness or for indefiniteness, and in dicta stated that if the claim was indefinite, the subject matter cannot be rendered invalid under 35 U.S.C. § 103.⁴³⁴ However, this particular dictum did not concern functional elements.

Claim 1 of Newman's patent application contained the following functional element. The associated structure is "an elongated strip":

which is tear resistant but will tear completely if subjected to a force which would jeopardize the safety of the wearer in an amusement park environment.⁴³⁵

The Board rejected the claim for indefiniteness.⁴³⁶ This rejection was based on the fact that it was not clear what was the minimum amount of force needed to tear the strip, and it was not clear what was the standard of safety.⁴³⁷

A paradox materialized. The examiner had cited a prior art reference (Melin) against the claim, alleging that Melin disclosed a tear-resistant strip with the same properties.⁴³⁸ But the Board reversed the prior art rejection, because it determined that the degree of tear resistance of Melin could not be compared with the degree of tear resistance required by the claim.⁴³⁹ In the Board's words, "it is impossible to determine with any certainty whether the tear resistant glass fibre-reinforced paper of Melin . . . inherently possesses the degree of tear resistance required by these claims."⁴⁴⁰ In other words, the Board held that the ambiguity of the claim was so extreme, that the claim defied validity analysis under 35 U.S.C. §§ 102 or 103.⁴⁴¹

The result is that the Board rejected the claim under 35 U.S.C. § 112 (indefiniteness), but reversed the examiner's prior art rejection.⁴⁴²

One take-home lesson is that an attorney or agent needing to include a functional element in a claim can make the claim more resistant to prior art rejections can do so by drafting the functional element in a way that is ambiguous. However, this advice is not practical, since an attorney would not want to intentionally draft ambiguity into a claim. A better approach is to ensure that all functional elements are free of ambiguity by making sure that the functional element is adequately defined in the specification.

⁴³³ *Id.*; see also *Ex parte* Krick, No. 2009-007641, 2010 WL 3702395, at *1, *4 (B.P.A.I. Sept. 20, 2010); *Ex parte* Boyle, No. 2009-006121, 2011 WL 2491027, at *3 (B.P.A.I. June 20, 2011); *Ex parte* Box, No. 2010-001179, 2012 WL 359938, at *3 (B.P.A.I. Jan. 31, 2012).

⁴³⁴ *Application of Wilson*, 424 F.2d 1382, 1385 (C.C.P.A. 1970).

⁴³⁵ *Newman*, 2002 WL 851849, at *2.

⁴³⁶ *Id.* at *3.

⁴³⁷ *Id.*

⁴³⁸ *Id.*

⁴³⁹ *Id.* at *4.

⁴⁴⁰ *Id.* at *3.

⁴⁴¹ *Id.* at *4, *5.

⁴⁴² *Id.* at *3.

B. Indefiniteness rejections against functional elements that are a mélange of a device claim and methods claim.

When drafting a functional element, an occasional mistake is that the functional element turns out inadvertently to require performance of an action. In other words, the claim is a mélange of a claim to a device and also a claim to a method of using the device. This confusion was an issue in *Ex parte Johnston*,⁴⁴³ *Ex parte Di Francesco*,⁴⁴⁴ and *Ex parte Hahn-Carlson*.⁴⁴⁵ The result can be a rejection for indefiniteness under 35 U.S.C. § 112(b).⁴⁴⁶ The disputed claim in *Ex parte Johnston* was as follows. The associated structure is “rigging”:

[Claim] 1. A triangulated mobile gantry crane, comprising . . . rigging that extends downwardly from the beams . . . the rigging **lifting the load from the ground upon subsequent extension of said booms and that then being releasable from the load upon subsequent retraction of the said booms.**⁴⁴⁷

The Board held that “it is not clear whether Appellant [inventor] is claiming a method of loading and unloading in combination with the gantry device or merely reciting functional language.”⁴⁴⁸ The result was that the claim was rendered invalid for indefiniteness.⁴⁴⁹

The following provides a context that demonstrates the distinctive fact pattern of *Ex parte Johnston*. *Ex parte Johnston* fits into the last of these fact patterns. In construing a claim to a device or composition, the Board encounters an element that resembles a functional element and then proceeds to take one of the following decision trees:

- Decision No. 1. The Board identifies the element as a functional element, and then determines if the prior art expressly discloses the same function;⁴⁵⁰

⁴⁴³ *Ex parte Johnson*, No. 2009-004993, 2010 WL 3948080, at *3 (B.P.A.I. Sept. 30, 2010). *Ex parte Johnson* provides the useful advice that the standard for indefiniteness is lower in prosecution than in litigation. *Id.* This different standard stems from two sources, namely, the presumption of validity of issued patents, and from the policy of the USPTO to require the applicant to more precisely define the metes and bounds of the claimed invention, where this requirement takes the form of indefiniteness rejections. *Ex parte Miyazaki*, No. 2007-3300, 2008 WL 5105055, at *6 (B.P.A.I. Nov. 19, 2008).

⁴⁴⁴ *Ex parte DiFrancesco & Griffiths*, No. 2009-013923, 2010 WL 4991485, at *3 (B.P.A.I. Dec. 3, 2010).

⁴⁴⁵ *Ex parte Hahn-Carlson*, No. 2010-001876, 2011 WL 3871995, at *2 (B.P.A.I. Aug. 29, 2011).

⁴⁴⁶ Formerly 35 U.S.C. § 112 ¶ 2.

⁴⁴⁷ *Ex parte Johnston*, No. 2009-004993, 2010 WL 3948080, at *1 (B.P.A.I. Sept. 30, 2010).

⁴⁴⁸ *Id.* at *3.

⁴⁴⁹ *Id.*

⁴⁵⁰ *Ex parte Aflekt*, No. 2007-2815, 2007 WL 2823738, at *6 (B.P.A.I. Sept. 27, 2007); *Ex parte Ahnert & Pollak*, No. 2009-002287, 2009 WL 2137372, at *3, *4 (B.P.A.I. July 16, 2009); *Ex parte Becker*, No. 2008-005716, 2009 WL 1712926, at *8 (B.P.A.I. June 1, 2009); *Ex parte Bianchi*, No. 2009-009024, 2011 WL 729510, at *5 (B.P.A.I. Feb. 28, 2011); *Ex parte Champion & Beatty*, No.

- Decision No. 2. The Board identifies the element as a functional element, and then determines if the prior art is capable of the same function;⁴⁵¹
- Decision No. 3. The Board dismisses the element as merely “intended use” and holds that the element has no patentable weight;⁴⁵²
- Decision No. 4. In evaluating a claim to a device, the Board notices an element that recites a method that must be performed when making or using the invention that is encompassed by the device claim, and consequently holds the claim to be invalid for indefiniteness.⁴⁵³

The take-home lesson is that attorneys and agents should ensure that their functional elements do not appear to require the performance of any particular method.⁴⁵⁴

A case from the Federal Circuit, *R.A.C.C. Industries, Inc. v. Stun-Tech, Inc.*, also discloses an example of, and warns against, claims that are a hybrid of an apparatus claim and methods of use claim.⁴⁵⁵ On occasion, rejections from examiners have

2009-003797, 2009 WL 5449478, at *4 (B.P.A.I. Dec. 31, 2009); *Ex parte* Cooper, No. 2010-000730, 2010 WL 4219748 (B.P.A.I. Oct. 25, 2010); *Ex parte* Downs, No. 2009-009496, 2010 WL 327314, at *2 (B.P.A.I. Jan. 27, 2010); *Ex parte* Duckett & Kessler, No. 2009-004516, 2009 WL 2342071, at *3 (B.P.A.I. July 30, 2009); *Ex parte* Eis & Willmes, No. 2009-005148, 2010 WL 2340160, at *3 (B.P.A.I. June 9, 2010); *Ex parte* Emmer, No. 2010-000511, 2010 WL 2547683, at *3 (B.P.A.I. June 23, 2010); *Ex parte* Golden, No. 2010-001401, 2011 WL 5116530, at *2 (B.P.A.I. Oct. 21, 2011); *Ex parte* Grilletto & Kutlu, No. 2008-3595, 2008 WL 2942158, at *3 (B.P.A.I. July 30, 2008); *Ex parte* Jones, No. 2005-2180, 2005 WL 3067958, at *3 (B.P.A.I. Sept. 29, 2005); *Ex parte* Kim, No. 2009-002842, 2009 WL 2981518, at *6 (B.P.A.I. Sept. 18, 2009); *Ex parte* Kline, No. 2008-4254, 2009 WL 357784, at *9 (B.P.A.I. Feb. 12, 2009); *Ex parte* Kelkar & Malladi, No. 2009-002276, 2009 WL 1904063, at *4 (B.P.A.I. July 2, 2009); *Ex parte* Mardian, No. 2008-2369, 2008 WL 2321841, at *5 (B.P.A.I. June 5, 2008); *Ex parte* Mullick, No. 2010-005090, 2011 WL 3872016, at *3 (B.P.A.I. Aug. 29, 2011); *Ex parte* Rodriguez & Smith, No. 2009-012248, 2011 WL 3871985, at *2 (B.P.A.I. Aug. 29, 2011); *Ex parte* Sanocki, No. 2008-2497, 2008 WL 2553081, at *4 (B.P.A.I. June 25, 2008); *Ex parte* Schmieding, No. 2009-009983, 2011 WL 601932, at *4 (B.P.A.I. Feb. 18, 2011); *Ex parte* Shaw, No. 2010-003526, 2011 WL 4009524, at *3 (B.P.A.I. Aug. 31, 2011); *Ex parte* Sjoberg, No. 2009-003597, 2009 WL 2807784, at *2 (B.P.A.I. Aug. 31, 2009); *Ex parte* Urban & Cobas, No. 2008-4743, 2008 WL 5054187, at *3, *4, *5 (B.P.A.I. Nov. 26, 2008).

⁴⁵¹ *Ex parte* Aaron, No. 2009-003442, 2009 WL 1940558, at *5 (B.P.A.I. July 2, 2009); *Ex parte* Baer & Close, No. 2009-001697, 2009 WL 2007185, at *4–5 (B.P.A.I. July 9, 2009); *Ex parte* Casey II, No. 2006-0526, 2006 WL 1665570, at *2 (B.P.A.I. Mar. 21, 2006); *Ex parte* Dando, No. 2008-4024, 2008 WL 4143442, at *3 (B.P.A.I. Sept. 4, 2008); *Ex parte* English, No. 2009-003199, 2010 WL 2637984, at *2 (B.P.A.I. June 30, 2010); *Ex parte* Goncharko, No. 2008-005468, 2009 WL 1719532, at *5 (B.P.A.I. June 11, 2009); *Ex parte* Hartmann, No. 2008-3391, 2008 WL 4418279, at *1 (B.P.A.I. Sept. 29, 2008).

⁴⁵² *Ex parte* Warner, No. 2006-1748, 2006 WL 2524303, at *2 (B.P.A.I. Aug. 29, 2006).

⁴⁵³ MPEP, *supra* note 2, § 2173.05(p)(II)

⁴⁵⁴ See, e.g., *Johnston*, 2010 WL 3948080, at *3.

⁴⁵⁵ *R.A.C.C. Indus., Inc. v. Stun-Tech, Inc.*, 98-1186, 1998 U.S. App. LEXIS 30769, at *8 (Fed. Cir. 1998).

alleged that functional elements are indefinite *per se*. However, the Board does not accept this *per se* approach.⁴⁵⁶

C. Indefiniteness where the functional element is not coupled with any structural element

A functional element can also attract a rejection for indefiniteness where the functional element is not coupled with any structural element. This fact pattern appears in *Ex parte Lind*.⁴⁵⁷ Although the Board disagreed with the examiner's perception that the structural element was missing, this case is still valuable for pointing out this potential issue.⁴⁵⁸ *Ex parte Levy* also concerns a claim to a device, but where the body of the claim consisted only of functional elements.⁴⁵⁹ The Board held that the claim was invalid for indefiniteness (35 U.S.C. § 112).⁴⁶⁰ The preamble of the claim did contain one structural element ("detector").⁴⁶¹ Moreover, it is evident that the word "detector," although referring to a structure, only describes the function (detecting), and fails to require or imply the presence of any particular structure.⁴⁶²

XIV. INHERENCY-BASED REJECTIONS.

A claim can be rejected for anticipation or for obviousness, where the examiner alleges that one or more elements is inherent in the prior art. This is an inherency-based rejection. Inherency-based rejections can be directed against a structural element, against a functional element, or against both elements, as they might occur in any given claim. Although the topic of inherency is too broad to cover in this article, the following point must be noted. The danger of an inherency-based rejection against a functional element is the rule of *In re Schreiber*,⁴⁶³ which shifts the burden to the inventor, where the burden is to prove that the cited prior art does not possess the function in question. The best way to prove that the cited prior art does not possess the function, is for the inventor to provide side-by-side laboratory data comparing the prior art composition or device with the claimed composition or device. Unfortunately, such data is usually not available to the inventor, and thus, the inventor is not able to rebut the rejection.

⁴⁵⁶ See *Ex parte Zehner & Uitenbroek*, No. 2007-1560, 2007 WL 2383805, at *2-3 (B.P.A.I. Aug. 21, 2007); *Ex parte Oberg & Mitchell*, No. 2002-0225, 2002 WL 32334597, at *1 (B.P.A.I. June 13, 2002); *Ex parte De Paoli*, No. 2008-1364, 2008 WL 2878514, at *1 (B.P.A.I. July 25, 2008); *Ex parte Sicking*, No. 2000-0523, 2001 WL 1057283, at *1 (B.P.A.I. Dec. 11, 2000); *Ex parte Betzold & Busacker*, No. 2011-011011, 2012 WL 3801747, at *1 (B.P.A.I. Aug. 28, 2012); *Ex parte Campbell*, No. 2001-1404, 2001 WL 34013819, at *1 (B.P.A.I. Nov. 27, 2001).

⁴⁵⁷ *Ex parte Lind*, No. 2003-0117, 2004 WL 77362, at *1 (B.P.A.I. July 9, 2003).

⁴⁵⁸ *Id.* at *3.

⁴⁵⁹ *Ex parte Levy*, No. 2009-010447, 2011 WL 4528803, at *1 (B.P.A.I. Sept. 28, 2011).

⁴⁶⁰ *Id.* at *9.

⁴⁶¹ *Id.* at *8.

⁴⁶² *Id.* at *1.

⁴⁶³ *In re Schreiber*, 128 F.3d 1473, 1478 (Fed. Cir. 1997).

Fortunately, a handful of cases from the Board provide guidance on rebutting inherency-based rejections against a claim possessing a functional element. *Ex parte Brennan* concerned a claim to tissue paper having the function of “a saturation gradient index of from about 1.0 to about 1.5.”⁴⁶⁴ The Board reversed the rejection, on the basis that the examiner failed to provide “direction offered by the secondary references to select the parameters necessary to produce the saturation gradient index.”⁴⁶⁵ This type of rebuttal seems most applicable to functional elements that include a value or number. The same sort of rebuttal strategy is set forth in *Ex parte York*.⁴⁶⁶ In *Ex parte York*, the Board wrote that, “where the parameter optimized was not recognized to be a result-effective variable, routine optimization would not have been obvious.”⁴⁶⁷

A more general approach of rebutting inherency-based rejections against claims having a functional element is as follows. The general approach is to point out a glitch in the examiner’s reasoning. This rebuttal approach is exemplified by *Ex parte Fazekas*, where the Board held that “the examiner must provide sufficient evidence or scientific reasoning to establish that there is a sound basis for the examiner’s belief that the functional limitation is an inherent characteristic of the prior art.”⁴⁶⁸ Similarly, in *Ex parte Heatmax*, the Board reversed the inherency-based rejection, writing that “[b]ecause the Examiner’s inherency theory is based on mere possibilities or probabilities, we cannot uphold any of the rejections that rely on Tsuji [prior art] as inherently disclosing the disputed claim limitation.”⁴⁶⁹ *Ex parte Quickie* provides yet another fact pattern, where the examiner’s inherency-based rejection against a functional element was found to be “speculative.”⁴⁷⁰

Thus, this general approach is to argue that the examiner has not met the burden of providing sufficient evidence or scientific reasoning, preferably with an argument why the cited prior art is not capable of performing the function in question.

In reviewing the 600 opinions used to prepare this article, the author arrived at the impression that, in the situation where the examiner imposed an inherency-based rejection against a functional element, it was the case that about three-quarters of these rejections were sustained by the Board, and that only a quarter were reversed. Where the rejection was sustained, the Board appropriately stated that it was “reasonable to believe” that the prior art was capable of the function in question, and that the inventor had failed to rebut the reasonable belief.⁴⁷¹ To provide another example, where the rejection was sustained, the Board appropriately stated that, “the Examiner has advanced a reasonable evidentiary basis for finding that [the prior art] device has all of the structural features required of [the] claims,” and thus would reasonably be capable of the function.⁴⁷² In yet another example, the

⁴⁶⁴ *Ex parte Brennan & Blasubramanian*, No. 2011-003613, 2012 WL 4165615, at *1 (B.P.A.I. Sept. 17, 2012).

⁴⁶⁵ *Id.* at *3.

⁴⁶⁶ *Ex parte York*, No. 2011-010194, 2012 WL 985687, at *5 (B.P.A.I. Mar. 20, 2012).

⁴⁶⁷ *Id.* at *5.

⁴⁶⁸ *Ex parte Fazekas*, No. 2010-005303, 2012 WL 3766651, at *3 (B.P.A.I. Aug. 24, 2012).

⁴⁶⁹ *Ex parte Heatmax, Inc.*, No. 2012-002361, 2012 WL 116926, at *5 (B.P.A.I. Jan. 12, 2012).

⁴⁷⁰ *Ex parte Quickie, LLC*, No. 2012-000944, 2012 WL 2316828, at *4 (B.P.A.I. June 15, 2012).

⁴⁷¹ See, e.g., *Ex parte Lau*, No. 2010-002161, 2012 WL 1562289, at *4 (B.P.A.I. Apr. 30, 2012).

⁴⁷² *Ex parte Hall*, No. 2011-012631, 2012 WL 1068042, at *3 (Mar. 27, 2012).

Board observed that the prior art device “bears a striking resemblance to that of the appellant’s invention, and we see no reason why it is not capable of [fulfilling the functional element of the claim].”⁴⁷³ As a result, the Board affirmed the rejection.⁴⁷⁴ Thus, it is this author’s opinion that the best reason to make conservative use of functional elements, when drafting claims, is the danger of an insurmountable inherency-based rejection.

XV. FUNCTIONAL ELEMENTS IN EUROPEAN PATENT CLAIMS.

Where an inventor files a patent with the USPTO, it is frequent also to file a corresponding PCT patent application. The PCT patent application serves as a placeholder, where the inventor is then given time to make decisions on foreign filings.⁴⁷⁵ Typically, after a period of a year or so after filing the PCT application, the PCT application is then broadcast to patent offices in various countries in Europe, as well as to Australia, Canada, Japan, South Korea, and China.⁴⁷⁶ The advice and conclusions set forth in this article are likely applicable to patent claims in European countries, in view commentary on functional elements, from the Boards of Appeal of the European Patent Office:

functional definitions are widely used and accepted for the definition of features in claims as long as the person skilled in the art knows, without exceeding his normal skills and knowledge, what he has to do in order to obtain said result . . . such a definition by the result to be achieved or by the function to be fulfilled, indicating what the feature should be there for, allows for a fair protection for the applicant or inventor.⁴⁷⁷

In another case from Europe, the Board considered the functional element “being present in amounts and proportions just sufficient to arrest bleeding.”⁴⁷⁸ The Examiner had rejected the claim for lack of clarity (Article 84 EPC) (the European equivalent of indefiniteness). Regarding this element, the Board wrote that it:

is indeed a functional feature which defines a technical result. However, said feature constitutes also a testable criterion which has to be satisfied by the claimed pharmaceutical composition. Its testing might appear *prima facie* bothersome, but it is nothing out of the ordinary for the field of medicines and involves only routine trials. Thus, the adopted functional language is allowable and in line with the EPO case law (see in particular T 68/85, OJ EPO 1987, 228).⁴⁷⁹

⁴⁷³ *Ex parte* Johnson, No. 96-0776, 1996 WL 1748893, at *5 (B.P.A.I. Aug. 13, 1997).

⁴⁷⁴ *Id.* at *6.

⁴⁷⁵ See generally MPEP, *supra* note 2, § 1800.

⁴⁷⁶ *Id.*

⁴⁷⁷ *In re* Therakos, Inc., No. T1222/07-3.2.02, at 9 (T.B.A.E.P.O. Jan. 26, 2011).

⁴⁷⁸ *In re* Queen’s Univ. at Kingston, No. T0893/90-3.3.2, at 4 (T.B.A.E.P.O. July 22, 1993).

⁴⁷⁹ *Id.*

Thus, the European Board considered and allowed a claim having the functional element.

On the other hand, the *Guidelines for Examination in the European Patent Office* warn that functional elements in claims can result in the claim being rejected for lack of “clarity.” Regarding rejections for lack of clarity, these Guidelines state that:

[t]he area defined by the claims must be as precise as the invention allows. As a general rule, claims which attempt to define the invention by a result to be achieved should not be allowed, in particular if they only amount to claiming the underlying technical problem. However, they may be allowed if the invention either can only be defined in such terms or cannot otherwise be defined more precisely without unduly restricting the scope of the claims and if the result is one which can be directly and positively verified by tests or procedures adequately specified in the description or known to the person skilled in the art and which do not require undue experimentation (see T 68/85). For example, the invention may relate to an ashtray in which a smouldering cigarette end will be automatically extinguished due to the shape and relative dimensions of the ashtray.⁴⁸⁰

Thus, the Guidelines warn against claiming an invention by “a result to be achieved,” that is, by way of a functional element. Rejections for lack of clarity are often imposed against claims that contain functional elements, as is evident from the file histories available on www.epo.org, but these file histories also provide guidance on how to rebut the rejections. The following quotes from a rebuttal in the file history of European Patent EP1164874. The inventor rebutted the allegation of lack of clarity, regarding the functional element, as follows:

[i]t is remarked that broadness of the claims by claiming by the result to be achieved does not necessarily imply a lack of clarity. What is in fact important is that the claims are reproducible by the skilled man. In that respect, it is constant jurisprudence that such broad claims are allowable as long as the man skilled in the art knows without exceeding his normal skills and knowledge what he has to do in order to obtain said result. This is precisely the case here.⁴⁸¹

Hence, it is the case that the European Patent Office simultaneously praises and condemns functional elements. The take-home lesson is that U.S. attorneys can be assured that functional elements are recognized, in Europe, as genuine claim elements that have patentable weight. But U.S. attorneys should also be prepared to receive rejections from European examiners, where the rejection alleges that functional elements cause the claim to lack clarity.

⁴⁸⁰ EUROPEAN PATENT OFFICE, EUROPEAN PARLIAMENT, GUIDELINES FOR EXAMINATION IN THE EUROPEAN PATENT OFFICE § 4.10 (Sept. 2013).

⁴⁸¹ Communication from Attorney to European Patent Office, European Patent Application No. 00 914 366.0-2114, at 2 (Aug. 28, 2003).

XVI. CONCLUSION.

Functional elements, also known as functional limitations, are present in patent claims from all technological fields. Functional elements represent a powerful claim-drafting tool that can increase claim scope. These elements increase claim scope in a manner similar to that of means plus function claims, but without the constraining requirement that the “means” in means plus function claims be restricted to embodiments (and their equivalents) that are disclosed in the specification. Most commonly, a functional element, when properly interpreted, can mandate or impose a particular range of structures or chemical compositions of the corresponding structural element in the claim.

Unfortunately, cases from the Federal Circuit are essentially devoid of guidance for drafting functional elements, and for construing claims that have functional elements. But fortunately, a huge number of cases from the Board is available, where these cases establish consistent guidance for about a dozen recurring issues. All of these issues are documented in this article.

A primary concern, in drafting functional elements into a claim, is that, the claim will be rejected for anticipation or for obviousness in view of the prior art. Specifically, the attorney’s concern is that she will be faced with the need to argue that the cited prior art does not disclose the function, and that the cited prior art is not capable of performing that function. To be prepared for this type of rejection, the attorney or agent should ensure that the specification, as originally filed, discloses one or more laboratory tests that describe how to measure that function. Also, the attorney or agent should ensure that the specification, as originally filed, contains recitations of alternative, narrower functions, for possible use in importing to the claims by way of an amendment. Moreover, the attorney or agent should be prepared to ask the client to conduct an experiment that compares the preferred embodiment of the claimed invention, with the closest possible embodiment of the prior art device or composition. In the ideal world, this comparative data is conducted prior to filing the patent application, and is incorporated into the specification.

A secondary concern is that examiners routinely fail to realize that functional elements, recitations of “intended use,” and recitations of a “workpiece,” have genuine patentable weight. This article discloses all of the available techniques that are provided from opinions from the Board for arguing that recitations of functional elements, intended use, and workpieces, have patentable weight.