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Best Mode: A Plea to Repair or Sacrifice this Broken Requirement of United States Patent Law

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BEST MODE: A PLEA TO REPAIR OR SACRIFICE THIS BROKEN REQUIREMENT OF UNITED STATES PATENT LAW†

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I. INTRODUCTION

An inventor's obligation to disclose the best mode of her invention is strong consideration in the U.S. patent bargain, but the courts

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paradoxically define the scope of that obligation, thus rendering the enforcement of U.S. patents unreasonably unpredictable. If an inventor cannot reasonably foresee the scope of her obligation to disclose invention details, then she is subjected to the costs and risks of either overcompliance or undercompliance with the best mode requirement. The scope of the best mode requirement should either be reliably defined by an *en banc* ruling of the Court of Appeals for the Federal Circuit, or the requirement should be discarded entirely by legislative action, preferably as a sacrificial bargaining chip during future international patent law harmonization efforts. Until then, however, an inventor should overcomply with the best mode requirement to avoid having her patent claims invalidated, or worse.

In light of the disservice that the best mode requirement currently does to patent law, this article advocates a drastic legal change, either to stabilize the scope of the best mode requirement and thus render it fit for the purpose it was intended to serve,[1] or to discard the requirement altogether. In addition, this article provides guidance for inventors in complying with the unpredictable best mode requirement. Section II of this article traces the evolution of the best mode requirement. Section III extracts a plain language definition of best mode from the current statutory and regulatory provisions. Then, the different standards of law regarding the scope of invention disclosure are chronologically culled from the case law in Section IV. Sections V and VI set forth a set of conclusions and recommendations, and, finally, Section VII provides a summary of the key points of this article. The Appendix provides aids for visualizing the author's suggested definition and scope of the best mode requirement.

II. Evolution of the Best Mode Requirement

Before consulting modern patent law, this article explores the historical perspectives on the best mode requirement. U.S. patent statutes have always encompassed, and have slowly evolved to explicitly state, what is now known as the best mode requirement. The original United States patent statute included a patent infringement defense where a patent specification failed to contain the "whole of the truth" about the

1. *See In re* Nelson, 280 F.2d 172, 184 (C.C.P.A. 1960) (the purpose of the best mode requirement is to safeguard against the tendency to disclose only what inventors know to be inferior modes, while retaining the best mode for themselves), *overruled by In re* Kirk, 376 F.2d 936 (C.C.P.A. 1967) (overruling *Nelson* on the issue of compliance with the 35 U.S.C. § 101 utility requirement, but not on the best mode issue).

patentee's invention or discovery.[2] The Patent Act of 1793 repealed and modified the original patent statute, but essentially retained the whole of the truth defense, rewording it but still requiring a patentee's specification to contain the "whole truth" related to the patentee's discovery.[3] In other words, an alleged infringer could invalidate a patent where a patentee neglected to disclose the whole truth relating to her discovery. An ordinary language interpretation of the defense suggests that the phrase "the whole truth" is a very broad requirement—broad enough to implicitly encompass a narrower requirement such as best mode.

The term "mode" was first used in the Patent Act of 1836, which required an inventor seeking a patent to explain the principle of a machine and the "several modes" associated with the application of that principle, as contemplated by the inventor.[4] The Patent Act of 1870 similarly required the inventor to explain the principle of a machine and the "*best* mode" contemplated that applies the principle.[5] Unfortunately, the Supreme Court failed to take the opportunity to accurately define the 1870 version of the best mode requirement.

In its 1875 decision of *Sewall v. Jones*, the Supreme Court addressed the quality of a patentee's patent disclosure en route to invalidating the patent on grounds of a lack of novelty.[6] The Court stated "[t]he omission to mention in the specification something which contributes only to the *degree of benefit* . . . is not fatal, while the omission of what is known to be necessary to the enjoyment of the invention is fatal."[7] This statement plainly ignores the addition of the best mode requirement that was enacted five years earlier. By definition the term "best" in the best mode requirement is all about the degree of benefit that results from an invention or discovery, and specifically means the maximum degree of benefit. Therefore, the *Sewall* Court erred by neglecting to consult the patent statute that was amended to incorporate the requirement of a *best* mode. Fortunately, the *Sewall* pronouncement on best mode was only dicta since compliance with best mode was not directly at issue.[8]

However, the next Supreme Court pronouncement on the topic of best mode was not dicta. In the 1880 decision of *Parks v. Booth*, the Supreme Court stated that an invention is "sufficiently described, . . . if

2. Patent Act of 1790, ch. 7, § 6, 1 Stat. 109, 111 (repealed 1793).

3. Patent Act of 1793, ch. 11, § 6, 1 Stat. 318, 322 (repealed 1836).

4. Patent Act of 1836, ch. 357, § 6, 5 Stat. 117 (repealed 1870).

5. Patent Act of 1870, ch. 230, § 26, 16 Stat. 198 (emphasis added), amended by Patents, Pub. L. No. 593, 66 Stat. 792 (1952).

6. Sewall v. Jones, 91 U.S. 171 (1875).

7. *Id.* at 185–86 (emphasis added).

8. *See id.* at 187 (stating that a holding of noninfringement was decided on the issue of lack of novelty).

the devices of which it is composed are specifically named, their mode of operation given, and the new and useful result . . . pointed out . . . ."[9] The Court applied this perfunctory rule, and held that the specification in question complied with the statute.[10] Although the alleged infringers specifically raised the best mode issue, the Supreme Court failed to even briefly address the meaning or scope of the best mode requirement. In light of the amended Patent Act of 1870, the *Parks* interpretation of a patentee's disclosure obligation was incorrect because it ignored the new and operative term "best" in the best mode requirement. *Sewall* and *Parks* thus foreshadowed the difficulty that all courts would have in defining the phrase best mode, and in calculating the requisite scope of disclosure of the best mode requirement.

III. DEFINITION OF BEST MODE

This section first presents the most recent statutory provision of the best mode requirement as embodied in the 1952 Patent Act,[11] and as unchanged by the American Inventors Protection Act of 1999.[12] Then, this section defines the phrase "best mode" both deductively and inductively, first by contrast with the phrase "preferred embodiment" and with the other statutory disclosure requirements, and then by assessing the plain language definition of the phrase "best mode."

A. *Deduced from the Statute*

Under current patent law in the United States, an inventor who applies for a patent is obligated to disclose the "best mode . . . of carrying out" her invention.[13] Meeting this best mode requirement is similar to performing an obligation in a "bargain" between the inventor and the people of the United States.[14] This bargain is founded in the Constitution of the United States, which explicitly provides to Congress the power to ". . . promote the Progress of Science . . . by securing for limited times to

9. Parks v. Booth, 102 U.S. 96, 102 (1880).

10. *Id.* at 103.

11. Patents, Pub. L. No. 593, 66 Stat. 792 (1952).

12. American Inventors Protection Act of 1999, Pub. L. No. 106-113, 113 Stat. 1501A-552 (1999).

13. 35 U.S.C. § 112 (2000).

14. Markman v. Westview Instruments, Inc., 52 F.3d 967, 997 (Fed. Cir. 1995) (Mayer, concurring) ("A patent can be conceived of as a contract between the inventor and the government. In return for full disclosure of the invention the government gives a monopoly of sorts for a time."); see also Eli Lilly and Co. v. Barr Labs. Inc., 251 F.3d 955, 963 (Fed. Cir. 2001) (stating that the ". . . best mode requirement creates a statutory bargained-for-exchange . . ."), *cert. denied*, 534 U.S. 1109 (2002).

. . . Inventors the exclusive right to their . . . Discoveries . . . ."[15] Under this constitutional grant of power, Congress has enacted several patent statutes over the centuries, the most recent of which promises inventors a 20-year right to exclude others from making, using, or selling the inventor's invention as claimed in the inventor's patent.[16] The U.S. government fulfills this promise to the inventor when a U.S. federal court upholds the validity of the inventor's patent and grants relief to the inventor against a proven infringer.

In consideration of the promise to grant the 20-year monopoly, Congress set forth the other end of the patent bargain. The government requests that inventors submit adequate disclosure of their claimed invention to enable prosecution and issuance of a patent. A unilateral contract is formed, at least conceptually, by the mutual consideration inherent in the government's promise to provide a 20-year monopoly on the inventor's discovery, and by the inventor's performance of the government's request for compliance with invention disclosure requirements.

An inventor's compliance with invention disclosure requirements ensures that the people of the United States receive something of value to justify the 20-year monopoly on an invention. To that end, the applicable statute requires inventors to include in their patent application:

> a written *description* of the invention, and of the manner and process of making and using it . . . to *enable* any person skilled in the art to which it pertains . . . to make and use the same, and shall set forth the *best mode* contemplated by the inventor of carrying out his invention.[17]

The applicable federal regulation does not explicitly define the phrase "best mode" any further and essentially paraphrases the statute, saying "[t]he best mode contemplated by the inventor of carrying out his invention must be set forth."[18]

i. Contrasted with "Preferred Embodiment"

One way to understand the best mode requirement is to understand what it is not. The phrase "best mode" is often confusingly interchanged with other phrases such as "preferred mode" or "preferred

15. U.S. CONST. art. I, § 8, cl. 8.

16. *See* 35 U.S.C. § 154(a)(2000).

17. 35 U.S.C. § 112 (2000) (emphasis added to highlight the trio of invention disclosure requirements).

18. 37 C.F.R. § 1.71(b) (2000).

embodiment."[19] This is problematic because the term "mode" does not equate precisely to the term "embodiment" as the former is broader than the latter. An embodiment is that in which an idea is concretely expressed.[20] Thus, an embodiment is something concrete or tangible, which can be subject to several different modes of manufacture, operation, implementation, uses of materials, etc. Furthermore, the term "best" is somewhat less subjective than the term "preferred". In other words, it is possible for an inventor to recognize that one mode is *best* for the intended commercial goals of the invention, such as lowering the cost and increasing the performance of the inventive subject matter. At the same time, however, the inventor may nonetheless *prefer* a different mode of the invention in accordance with a personal goal, such as increasing the environmental friendliness of the inventive subject matter. Thus, the terms "best" and "preferred" may be in conflict in the context of patent law disclosure. Therefore, mutated phrases like "preferred mode" or "preferred embodiment" should not be confused with the statutory phrase "best mode," especially since there is no explicit statutory requirement for a preferred embodiment or preferred mode.

ii. Contrasted with the "Description" and "Enablement" Requirements

The best mode requirement is distinct from the enablement requirement, which in turn is distinct from the description requirement.[21] The description of an invention is presumptively adequate upon filing and involves a factual question of whether the inventor has provided a specification (as of the date of filing her patent application) that conveys with reasonable clarity, to those of ordinary skill in the art, that the applicant was in possession of her invention (as finally claimed).[22] In other words, the inventor must describe essentially "what" she has invented and may not, after filing her patent application, attempt to reorient the claims beyond what was originally supported in the specification. In essence then, the description requirement is a proscription on attempting to claim new matter not originally disclosed.

In contrast, the enablement requirement presents a legal question of whether the specification discloses information sufficient to enable one

19. *See* DeGeorge v. Bernier, 768 F.2d 1318, 1324–25 (Fed. Cir. 1985) (a classic example of the confusion. "Compliance with the best mode requirement exists when an inventor discloses his preferred embodiment.").

20. *See* 5 OXFORD ENGLISH DICTIONARY 164 (2d ed. 1989) (defining the term embodiment), *available at* http://www.oed.com.

21. *See In re* Newton, 414 F.2d 1400 (C.C.P.A. 1969); *accord* Vas-Cath, Inc. v. Mahurkar, 935 F.2d 1555, 1562 (Fed. Cir. 1991).

22. *Vas-Cath, Inc.*, 935 F.2d at 1563–64.

of ordinary skill in the art to make and use the claimed invention without having to conduct undue experimentation to replicate the invention.[23] In this regard, disclosure of a working example is unnecessary, and even a "prophetic example" based merely on predicted results may be sufficient.[24] In other words, the inventor must describe "how" the invention can be reasonably replicated. A failure to set forth any mode whatsoever would amount to non-enablement.[25] Whether an inventor has disclosed what the inventor feels is the *best* mode is a question separate and distinct from the question of the *sufficiency* of the disclosure.[26]

As an aid for visualizing the above-discussed contrasts between the disclosure requirements of 35 U.S.C. § 112, the Appendix includes a Venn diagram (hereinafter Diagram 1). Diagram 1 is self-explanatory if reviewed with care and interest, but a cursory description follows as a guide for the reader. For illustrative purposes, Diagram 1 uses a simple and purely hypothetical example of the invention of an internal combustion engine.

In Diagram 1, the prior art is represented by dashed-line circles near the margins of the diagram. The largest circle represents the maximum allowable scope of a claim of an invention, as constrained by the limits of the prior art, and as supported by adequate disclosure of the invention in compliance with the requirements of § 112. The overlapping circles within the largest circle represent the first two of the trio of § 112 requirements. On the left is the so-called description requirement and on the right is the so-called enablement requirement.

The description circle includes three different tangible manifestations of the idea of the invention (embodiment 1, embodiment 2, and embodiment 3) only one of which is considered the best: embodiment 2. The enablement circle includes various ways of making and using the different tangible manifestations of the invention, only one of each of which is considered the best. As also reflected in the diagram, enablement disclosure should also include various information including invention testing results and calibration procedures, if developed as of the filing date of the invention.

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23. *See* Minerals Separation, Ltd. v. Hyde, 242 U.S. 261 (1916); *see also In re* Wands, 858 F.2d 731 (Fed. Cir. 1988).

24. Atlas Powder Co. v. E.I. du Pont De Nemours & Co., 750 F.2d 1569, 1577 (Fed. Cir. 1984) (stating that mere use of prophetic examples does not render a patent non-enabling); *In re* Honn, 364 F.2d 454 (C.C.P.A. 1966) (explaining that the absence of a specific example is not necessarily evidence that the best mode has not been disclosed).

25. *See In re* Glass, 492 F.2d 1228 (C.C.P.A. 1974).

26. *See* Spectra-Physics, Inc. v. Coherent, Inc., 827 F.2d 1524 (Fed. Cir. 1987); *see also In re* Glass, 492 F.2d 1228 (C.C.P.A. 1974); *In re* Gay, 309 F.2d 769 (C.C.P.A. 1962).

In the hypothetical, the inventor has contemplated the following three architectures of internal combustion engine: gas turbine, reciprocating-piston, and rotary-piston. At the time of filing the patent application, the inventor personally *prefers* the gas turbine architecture because she is fascinated by the interesting complexity of its operating cycle. However, she contemplates that the reciprocating-piston architecture, particularly a V-6 model, is *best* from a marketability standpoint. Further, the V-6 embodiment is subject to a multitude of modes including automatic or manual assembly, operation on gasoline or diesel fuel, implementation in an automobile or in a boat, and composition of aluminum or iron.

Where the circles overlap is where the best alternatives of the description and enablement requirements meet to define the best mode of the invention. The margin between the exterior of the overlapping circles and the interior of the largest circle depicts where U.S. patent law allows inventors and patent practitioners to have some latitude in complying with the § 112 disclosure requirements. In other words, one need not disclose every last detail of the invention that would be obvious to one of ordinary skill in the art[27] and that would not require undue experimentation.[28]

In summary, the best mode requirement is a subset that represents the intersection of two larger sets—the written description and enablement requirements. Thus, the best mode requirement is not limited to just the "what" (description requirement) or the "how" (enablement requirement) of an invention. Rather, the best mode requirement may well be thought of as the "what best" and "how best" of an invention.

B. *Induced by Ordinary Meaning*

The definition of the phrase "best mode" may be better understood with reference to the plain dictionary meanings of its constituent terms. "Best" means "of the greatest usefulness for the purpose intended."[29] "Mode" means the "manner in which a thing is done. . . ."[30] The word "done", which is the past tense of the verb do, is perhaps one of the broadest words in the English language, and thereby certainly includes having done something such as embodied an idea in a tangible example, made something, or used something. Within the context of patent law,

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27. *In re* Gosteli, 872 F.2d 1008, 1012 (Fed. Cir. 1989); *accord* Vas-Cath, Inc. v. Mahurkar, 935 F.2d 1555 (Fed. Cir. 1991).

28. *See* W.L. Gore & Associates, Inc. v. Garlock, Inc., 721 F.2d 1540, 1557 (Fed. Cir. 1983) ("A patent is invalid only when those skilled in the art are required to engage in *undue* experimentation to practice the invention.") (emphasis original).

29. BLACK'S LAW DICTIONARY 160 (6th ed. 1990).

30. *Id.* at 1003.

the verbs make and use implicate the enablement requirement, while the verb embody implicates the description requirement. Therefore, by its ordinary meaning, best mode means the manner in which an invention is embodied, made, and used that yields the greatest usefulness for the purpose intended for the invention.

IV. Scope of Invention Disclosure Needed to Satisfy the Best Mode Requirement

This section analyzes case law in order to determine how much detail an inventor needs to disclose to comply with the best mode requirement. First, this section sets forth the procedural standards and current substantive inquiries used by the courts. Then, this section examines a chronology of case law interpreting the modern best mode statutory provision, wherein we discover a variety of conflicting standards of law that are deployed by the courts. Finally, this section presents specific examples that illustrate the irreconcilable conflict of the various standards of law.

A. *Best Mode Analysis: Procedural and Substantive*

Procedurally, the determination of compliance with the best mode requirement is a question of fact and, thus, may be presented to a jury[31] where an alleged infringer has elected to defend herself using the best mode requirement as a defense to patent infringement. The alleged infringer bears the burden of proving that the inventor violated the best mode requirement by meeting a standard of clear and convincing evidence,[32] which lies somewhere between the preponderance of the evidence standard and the beyond a reasonable doubt standard.[33] The trial court's factual findings will not be overturned on appeal unless clearly erroneous[34] and, thus, as long as the best mode inquiry remains one of fact, a jury finding is likely to be determinative of the issue. If, however, the best mode inquiry involves ascertaining the scope of the

31. *See* Mentor H/S, Inc. v. Med. Device Alliance, Inc., 244 F.3d 1365, 1376 (Fed. Cir. 2001).

32. *See id.* at 1375 (quoting Nobelpharma AB v. Implant Innovations, Inc., 141 F.3d 1059, 1064 (Fed. Cir. 1998)).

33. Black's Law Dictionary 251 (6th ed. 1990) (defining "clear and convincing proof").

34. *See* Diversitech Corp. v. Century Steps, Inc., 850 F.2d 675 (Fed. Cir. 1988) (stating that the district court's decision is reviewable for clear error).

claims, then the best mode inquiry arguably becomes one of claim construction, which is a question of law reviewed *de novo*.[35]

Substantively, the determination of compliance with the best mode requirement involves analysis of *who* must disclose, *when* they must disclose, and *what* they must disclose. By the plain language of the statute, it is evident that best mode applies to only what *the inventor* contemplated as best, and not what anyone else contemplated.[36] However, just because the inventor did not discover the best mode does not mean that the inventor need not disclose it.[37] In other words, if a co-worker of the inventor reviews the inventor's invention disclosure and suggests a better way of carrying out the invention and the inventor agrees, then the inventor must disclose her co-worker's suggestion.

However, the inventor's obligations of disclosure do not include that which is not known to the inventor, but that is known to the inventor's assignee in general.[38] For example, if the inventor's co-worker learns of the inventor's disclosure and identifies a better mode, but the inventor herself is not aware of that mode, then neither the inventor nor the assignee, is obliged to disclose it. The inventor's obligation to disclose the best mode terminates as of *the date of filing*, and thereafter the inventor need not update the application with a later-discovered best mode.[39]

What the inventor must disclose is analyzed under the second of two inquiries of what is referred to as the "*Chemcast* test."[40] The first inquiry

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35. *See* Markman v. Westview Instruments, 517 U.S. 370 (1996); *see also* Michael R. Franzinger, *Best Mode Requirement:* Northern Telecom Ltd. v. Samsung Electronics Co., 16 BERKELEY TECH. L.J. 165, 177 (proposing that best mode may now be more of a question of law).

36. 35 U.S.C. § 112.

37. *See* Consol. Aluminum Corp. v. Foseco Int'l, Ltd., 10 U.S.P.Q.2d 1143 (N.D. Ill. 1988), *aff'd in part and rev'd in part*, 716 F. Supp. 316 (N.D. Ill. 1989), *and aff'd*, 910 F.2d 804 (Fed. Cir. 1990).

38. *See* Glaxo Inc. v. Novopharm Ltd., 52 F.3d 1043, 1051–52 (Fed. Cir. 1995) (holding that knowledge of assignee is not imputed to the inventor. "Congress was aware of the differences between inventors and assignees . . . and it specifically limited the best mode required to that contemplated by the inventor. We have no authority to extend the requirement beyond the limits set by Congress. . . . whether Glaxo deliberately walled off the inventor is irrelevant to the issue of failure of his application to disclose the best mode known to him."), *cert. denied*, 516 U.S. 988 (1995).

39. *See* Engel Indus., Inc. v. Lockformer Co., 946 F.2d 1528 (Fed. Cir. 1991); *see also In re* Gay, 309 F.2d 769, 773 (C.C.P.A. 1962) (Judge Giles Rich overturning a decision that invalidated a patent based on failure to comply with best mode based on the fact that the patent failed to include details later found in the inventor's marketed product. Judge Rich noted that "the patent law allows patent applications to be filed when in fact the invention has never been reduced to commercial form. Commonly, they are filed long before commercial embodiments reach the market.").

40. *See* Chemcast Corp. v. Arco Indus. Corp., 913 F.2d 923 (Fed. Cir. 1990); *accord* Eli Lilly and Co. v. Barr Labs. Inc., 251 F.3d 955 (Fed. Cir. 2001), *cert. denied*, 534 U.S. 1109 (2002).

is subjective and asks whether the inventor contemplated, at the time of filing, a best mode of carrying out her invention.[41] The second inquiry is objective and asks whether the disclosure is adequate to enable one skilled in the art to practice the best mode.[42] If the answer to the first inquiry is no, then the analysis stops and no violation of the best mode can be found. If, however, the answer to the first inquiry is yes and the answer to the second inquiry is no, then the patent claim is invalid and the alleged infringer prevails upon her best mode defense. Unfortunately, the *Chemcast* test merely defines the best mode requirement in terms of the enablement requirement and does not specify a more certain scope of disclosure that would satisfy the best mode requirement.

Recently, another commentator has also recognized this problem of an unresolved and uncertain scope of the best mode requirement and has suggested that there are two ways of assessing the scope of best mode disclosure, either using a "claims-only" standard, or a "necessity" standard.[43] According to the narrower claims-only standard, an inventor need not disclose the best mode of non-claimed subject matter[44]—meaning anything that is not an element explicitly recited in one of the claims. According to the broader necessity standard, an inventor must disclose all that is necessary to permit the public to achieve the benefit of her invention.[45] As shown below, many learned judges of the courts have vacillated between and beyond these definitions. Due to this vacillation, the best mode disclosure requirement continues to confuse practitioners and inventors. Next, this article explores some particularly noteworthy cases that interpret, or misinterpret, the scope of the best mode disclosure requirement.

B. *Case Law Paradox: Claimed Elements Only, or Broader*

This sub-section presents a chronology of the most pertinent patent cases that specifically interpret the scope of the best mode requirement per the modern statutory provision. The cases are briefly explored for their teachings on the standard of law to be followed in assessing the required scope of best mode disclosure. The Appendix includes Diagram 2 as an aid for visualizing the differences between the standards of the scope of best mode disclosure, as cited and applied by the case law discussed below. The cases are from various jurisdictions, including the United States Patent and Trademark Office Board of Patent Appeals and

41. Chemcast, 913 F.2d at 927–28.
42. *Id.* at 928.
43. Franzinger, *supra* note 35, at 166.
44. *Id.* at 166.
45. *Id.*

Interferences ("BPAI"), various Federal District Courts, the First, Sixth, and Seventh Circuit Courts of Appeal, the late United States Court of Customs and Patent Appeals ("CCPA"), and the Court of Appeals for the Federal Circuit ("CAFC"). The Supreme Court has not yet interpreted the meaning, or scope, of the modern best mode statutory provision.

i. Pre Federal Circuit Creation

In 1960, the CCPA decided *In re Nelson*.[46] The legendary Judge Giles Rich,[47] writing for the court, found compliance with the best mode requirement where inventors disclosed not only claimed compounds, but also how to make and how to use the claimed compounds. The court first noted that it was undisputed that the inventors had fully described the compounds and how to make them.[48] Then the court addressed the contested issue of whether the inventors disclosed how to use the compounds.[49] The court found that the inventors had, "said to those skilled in the art: Use [the claimed compounds] as intermediates to make other steroids having analogous structures; you can do this [using] methods which you already know about."[50] Later in the opinion Judge Rich summarized this position stating that:

> compliance with the law does not necessarily require specific recitations of use but may be inherent in description or may result from disclosure of a sufficient number of properties to make a use obvious; and where those of ordinary skill in the art will know how to use, the applicant has a right to rely on such knowledge.[51]

Judge Rich required that the methods of making and using the invention be disclosed, even though such methods were not claimed, based on the idea that any subject matter, non-obvious to those of ordinary skill in the art and relating to the methods of making and using an invention, must be disclosed to satisfy the best mode requirement.[52] In summary, it

46. *In re* Nelson, 280 F.2d 172 (C.C.P.A. 1960), *overruled by In Re* Kirk, 376 F.2d 936 (C.C.P.A. 1967) (overruling *Nelson* on the issue of compliance with the 35 U.S.C. § 101 utility requirement, but not on the best mode issue).

47. The late Judge Rich was a drafter of the 1952 Patent Act, was the oldest active federal judge, and is still considered the dean of modern patent law. *See Oldest Active Federal Judge Dies*, 31 THIRD BRANCH 5 (July 1999), at http://www.uscourts.gov/ttb/jul99ttb/oldest.html (last visited on Nov. 30, 2002).

48. *Nelson*, 280 F.2d at 175.

49. *Id.* at 177.

50. *Id.* at 182.

51. *Id.* at 184–85 (emphasis omitted).

52. *See id.* at 185.

is clear that Judge Rich and the CCPA did *not* limit the requisite scope of best mode disclosure to that of the claims-only standard.

1965 was the first year in which an appellate court invalidated a patent for failure to comply with the best mode requirement and involved subject matter that was nonclaimed.[53] In *Flick-Reedy Corp. v. Hydro-Line Manufacturing Co.*, the Seventh Circuit invalidated a patent for failing to describe a non-claimed special tool used to produce fine concentricity on one component for achieving an "*essential*" sealing relationship with another component.[54] Thus, *Flick-Reedy* established what the author suggests is an *essentiality* standard of law, such that any item mentioned in the disclosure that is used to achieve an essential element of the invention is subject to the best mode disclosure requirement, regardless of whether or not the item is claimed.

One year later, the CCPA ruled independently of, but similarly to, the *Flick-Reedy* essentiality standard.[55] In *In re Bosy*, the Patent Office accused inventors of failing to disclose the exact amount of ingredients involved in a method for recovering juice from grape mash. Unlike *Flick Reedy*, the *Bosy* decision did not inquire into whether the undisclosed subject matter fell within the claim language. Rather, the CCPA taught in *Bosy* that a specification need not set forth, "details not relating to the *essence* of the invention."[56] Hence, *Bosy* applies the essentiality standard.

In 1972, the CCPA reviewed a best mode rejection of a patent application claiming a chemical blend comprised of two separate starting materials: uniformly random ethylene-methacrylic acid copolymer and polyethylene.[57] The court reversed the rejection, stating that best mode inquiries pertain to carrying out the invention, which was the blend and not the starting materials.[58] However, the starting materials were explicitly set forth within claim 1 of the invention.[59] Therefore, it is difficult to see why the starting materials did not pertain to carrying out the invention if they were in fact spelled out within the scope of the very invention claimed. Given this logical disconnect, the *Brebner* holding should be limited to the specific facts of the case.

In 1976, the First Circuit modified the essentiality standard to uphold the validity of a patent where the inventor failed to disclose a proprietary formula for a non-claimed compound that was used to make

53. Flick-Reedy Corp. v. Hydro-Line Mfg. Co., 351 F.2d 546 (7th Cir. 1965), *cert. denied*, 383 U.S. 958 (1966).

54. *See id.* at 550 (emphasis added).

55. *In re* Bosy, 360 F.2d 972 (C.C.P.A. 1966).

56. *Id.* at 976 (emphasis added).

57. *In re* Brebner, 455 F.2d 1402 (C.C.P.A. 1972).

58. *Id.* at 1404.

59. *See id.* at 1403.

wire insulation, a claimed element.[60] The court decided that the proprietary formula was "not *essential*" to making the invention, in that it merely reduced the cost of making the invention.[61]

In 1977, the Sixth Circuit decided *Union Carbide Corp. v. Borg-Warner Corp.*, holding that a best mode violation occurs where the invention is a process and an inventor fails to disclose known and non-claimed apparatuses that improve, and that are an "*integral*" part of, the process.[62] Specifically, the inventor failed to disclose the existence, at the time of filing, of an improved version of a non-claimed valve apparatus that was used to achieve a claimed injection molding process.[63] The term "integral" is closely synonymous with the term "essential"[64] and, thus, the Sixth Circuit basically followed the essentiality standard of law.

In 1980, the CCPA held in *In re Sherwood* that no best mode violation occurred where an inventor failed to disclose a non-claimed computer program used in carrying out the claimed invention.[65] The CCPA stated that a best mode violation requires that the quality of an inventor's best mode disclosure is "so poor as to effectively result in concealment."[66] To buttress this rather vague recital of a standard, the court cited *Union Carbide* as a "similar standard" applied by other courts.[67] The court paraphrased *Union Carbide*, stating that the generic disclosure of an apparatus was insufficient best mode disclosure where the inventor considered an undisclosed special type of apparatus to be "*necessary* and desirable for practice of the [claimed process]."[68] Thus, it is reasonable to conclude that the *Sherwood* court somewhat broadened the essentiality standard and thereby established the necessity standard, which was recently recognized and coined by one commentator.[69]

In 1981, the BPAI declined to follow the *Sherwood* case in *Magdo v. Peltzer*.[70] The BPAI held that no best mode violation occurred, and stated

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60. *See* Int'l Tel. & Tel. Corp. v. Raychem Corp., 538 F.2d 453 (1st Cir. 1976), *cert. denied*, 429 U.S. 886 (1976).

61. *Id.* at 460 (emphasis added).

62. Union Carbide Corp. v. Borg-Warner Corp., 550 F.2d 355, 361 (6th Cir. 1977) (emphasis added).

63. *See id.*

64. MERRIAM-WEBSTER COLLEGIATE DICTIONARY 606 (10th ed. 2002) (defining the term integral as "essential to completeness" and "lacking nothing essential") *available at* http://www.m-w.com/dictionary/.

65. *In re* Sherwood, 613 F.2d 809 (C.C.P.A. 1980).

66. *Id.* at 816.

67. *Id.* at 816 n.5.

68. *Id.* (emphasis added).

69. *See* Franzinger, *supra* note 35.

70. Magdo v. Peltzer, 212 U.S.P.Q. (BNA) 838 (Pat. & Trademark Off. Bd. Pat. Intf. 1981), *aff'd in part and vacated in part by* Magdo v. Kooi, 699 F.2d 1325 (Fed. Cir. 1983) (declining to review best mode issue since untimely raised).

that an inventor need not "disclose the 'best mode' contemplated by him for solving those problems encountered by the prior art which extend beyond his specific contribution as claimed . . . ."[71] In other words, the court opined that an inventor need not disclose the best mode for non-claimed subject matter. Thus, the BPAI followed *Brebner* in narrowing the required scope of best mode disclosure to that subject matter within the claims only.

Less than one year later, in 1982, the BPAI used a standard that conflicts with the *Magdo* claims-only standard and found a best mode violation regarding subject matter beyond the invention as claimed.[72] This time, the BPAI invalidated a patent where an inventor did not disclose non-claimed, but novel, subject matter. The inventor failed to disclose a novel intermediate compound that was "part and parcel" to carrying out the claimed compound.[73] The phrase "part and parcel" was defined by the term "essential".[74] Thus, the BPAI broadened their prior interpretation of the scope of best mode disclosure to any subject matter, claimed or non-claimed, that is both *novel* and *essential*.

ii. Post Federal Circuit Creation

Later in 1982, Congress merged the United States Court of Claims and the CCPA to create the Court of Appeals for the Federal Circuit.[75] As of October 1, 1982, the CAFC is bound to follow the CCPA standards of law since the CAFC adopted the body of law established by the predecessor CCPA as precedent.[76] This theoretically obligated the CAFC to employ either the *Nelson* or *Sherwood* standard of law regarding the requisite scope of best mode disclosure. Even if *Nelson* is viewed as an overruled case, or even if the best mode analysis therein is treated as dicta,[77] then the necessity standard of *Sherwood* should have been applied, until overruled by the CAFC sitting *en banc*.[78]

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71. *Id.* at 845.

72. *See* Clayton v. Akiba, 214 U.S.P.Q. (BNA) 374 (Pat. & Trademark Off. Bd. Pat. Intf. 1982).

73. *Id.* at 381.

74. MERRIAM-WEBSTER'S COLLEGIATE DICTIONARY 845 (10th ed. 2002) (defining the phrase part and parcel as "an essential or integral component . . . ."), *available at* http://www.m-w.com.

75. Federal Courts Improvement Act of 1982, Pub. L. No. 97-164, §§ 122–127, 96 Stat. 25, 36–39 (1982).

76. *See* South Corp. v. United States, 690 F.2d 1368 (Fed. Cir. 1982).

77. *See supra* note 39.

78. *See* Mother's Restaurant, Inc. v. Mama's Pizza, Inc., 723 F.2d 1566, 1573 (Fed. Cir. 1983) (stating "The court may overrule a prior holding having precedential status only by an *in banc* [*sic*] decision."); *see also* YBM Magnex, Inc. v. ITC, 145 F.3d 1317, 1319 n.2 (Fed. Cir. 1998) ("Subsequent panel opinions may elaborate and refine and thus advance the evolution of judge-made law, but they can not change the law as established in prior rulings.");

Surprisingly, in its 1985 decision in *DeGeorge v. Bernier*, a panel of the CAFC bypassed both the precedent CCPA decisions of *Nelson* and *Sherwood* and instead used a standard first set forth by the BPAI.[79] Moreover, of the two conflicting BPAI standards available, the CAFC employed the claims-only standard consistent with the older BPAI decision in *Magdo*, rather than the essentiality standard consistent with the more recent BPAI decision in *Clayton*. Nevertheless, the court held that failure to meet the best mode requirement should not arise from an absence of information on a non-claimed element.[80] *DeGeorge* was thus the first instance in which the CAFC limited the best mode disclosure requirement to only that subject matter that falls within the scope of the claims.

Two years later, a completely different panel of the CAFC effectively ignored the *DeGeorge* standard in *Christianson v. Colt Industries Operating Corp.*, but, like the *DeGeorge* panel, found no best mode violation where an inventor failed to disclose non-claimed subject matter.[81] Strangely, this CAFC panel cited authority from the Tenth Circuit—a non-precedential jurisdiction.[82] Based solely on a jurisdictional dispute, the Supreme Court vacated and remanded the CAFC's *Christianson* decision with instructions to transfer the case back to the Seventh Circuit by the Supreme Court.[83] The Seventh Circuit deferred to the CAFC best mode analysis stating that "the focus of the best mode requirement . . . is on the *claimed* invention"[84] and quoted from the CAFC saying that the undisclosed element of "interchangeability . . . appears nowhere as a limitation in any claim . . . ."[85] Thus, the Seventh Circuit bypassed its own precedent of *Flick-Reedy* by adopting the CAFC's claims-only standard.

Johnston v. IVAC Corp., 885 F.2d 1574, 1579 (Fed. Cir. 1989) ("Where conflicting statements . . . appear in our precedent, the panel is obligated to review the cases and reconcile or explain the statements, if possible. If not reconcilable and if not merely conflicting dicta, the panel is obligated to follow the earlier case law which is the binding precedent."); Newell Cos., Inc. v. Kenney Mfg. Co., 864 F.2d 757, 765 (Fed. Cir. 1988) ("[P]rior decisions of a panel of the court are binding precedent on subsequent panels unless and until overturned *en banc*. . . . Where there is direct conflict, the precedential decision is the first.") (citation omitted).

79. DeGeorge v. Bernier, 768 F.2d 1318 (Fed. Cir. 1985).

80. *See id.* at 1325.

81. Christiansen v. Colt Indus. Operating Corp., 822 F.2d 1544 (Fed. Cir. 1987), *cert. granted*, 484 U.S. 985 (1987), *vacated*, 486 U.S. 800 (1988), *and transferred to* 870 F.2d 1292 (7th Cir. 1989).

82. *Id.* at 1563 (citing Plastic Container Corp. v. Continental Plastics of Oklahoma, Inc., 607 F.2d 885, 897 (10th Cir. 1979)).

83. Christianson v. Colt Indus. Operating Corp., 486 U.S. 800, 818–19 (1988).

84. Christianson v. Colt Indus. Operating Corp., 870 F.2d 1292, 1301 (7th Cir. 1989).

85. *Id.* at 1302 (quoting Christianson v. Colt Indus. Operating Corp., 822 F.2d 1544, 1563 (Fed. Cir. 1987)).

Incidentally, the Seventh Circuit's *Christianson* opinion expressed that "the best mode requirement is intended to allow the public to compete fairly with the patentee following the expiration of the patents."[86] Unfortunately, this proposition is incompatible with confining the scope of the best mode requirement to that of the claims alone because it would expand the requisite scope of best mode disclosure far beyond that of the claims-only and necessity standards. This is because placing responsibility on an inventor to enable the public to competitively employ the invention *following* the expiration of a patent would be an unreasonable burden on the inventor not contemplated by the statute. It would effectively obligate the inventor to continuously update her disclosure with new matter until her patent expired. Specifically, the inventor would be obligated to disclose far more detail than just the best mode of her invention, including production conditions and tolerances, distribution methods, etc. If the best mode requirement were intended to do such a broad service to the public, then the statute would require an inventor to continuously supply the public with updated best mode disclosures so that the public would be current with the inventor's state of the art as of the expiration of the patent. Such a requirement would also be impractical since there are too many other factors that influence whether the public could effectively compete, such as manufacturing and distribution strategy and efficiency, marketing appeal, etc. Perhaps what was meant to be expressed is that the best mode requirement is intended to allow the public to competitively replicate the invention, as best employed by the inventor, measured at the time of filing the patent application. This would permit the inventor's competitors to initiate their own improvements to the invention upon publication of the patent application or issuance of the patent and, fairly enough, would permit the inventor a head start roughly equal to the time of prosecution of the patent application.

In 1988, a CAFC panel majority expanded the scope of best mode disclosure beyond the claims-only standard in *Randomex, Inc. v. Scopus Corp.*[87] In analyzing compliance with the best mode requirement, the *Randomex* panel overlooked the scope of disclosure standards of the *Nelson*, *Sherwood*, *DeGeorge*, and *Christianson* cases. Instead, the court employed a "quality of disclosure" standard wherein a best mode is concealed if the quality of the disclosure is "so poor as to effectively result in concealment."[88] Under this quality of disclosure analysis, the court

86. *Id.* at 1302 n.8.

87. Randomex, Inc. v. Scopus Corp., 849 F.2d 585 (Fed. Cir. 1988).

88. *Id.* at 589 (citing Spectra-Physics, Inc. v. Coherent Inc., 827 F.2d 1524, 1536 (Fed. Cir. 1987)).

found that disclosure of the trade name of a non-claimed element (cleaning fluid) was sufficient to satisfy the best mode requirement because there were commercial substitutes that were readily available. In other words, the court determined that the best mode requirement was satisfied since the inventor had disclosed the preferred trade name for the cleaning fluid such that a competitor could replicate the invention and practice the best mode simply by purchasing the inventor's proprietary cleaning fluid.

Incidentally, the *Randomex* court offered a hypothetical that makes the best mode requirement easier to understand. The court hypothesized that if one should invent a new and improved internal combustion engine, then the best mode requirement would require the inventor to divulge the fuel on which the engine runs best.[89] Even though the fuel is not a claimed element of the invention, it is needed for carrying out the best mode of the invention. Similarly, the *Randomex* court acknowledged that the inventor in the case at hand failed to disclose the exact proprietary formula of the cleaning fluid that was "*needed* to practice the invention" even though the cleaning fluid was "not claimed specifically."[90] Thus, in addition to the quality of disclosure standard, the *Randomex* panel implicitly relied on the necessity standard in deciding the case.

Later in 1988, a panel of the CAFC found a best mode violation in *Dana Corp. v. IPC Ltd. Partnership*.[91] Several months before filing his patent application, the inventor evaluated various surface treatments of a valve-stem seal through testing. The tests revealed that fluoridation of the rubber valve-stem seals yielded the best results. Accordingly, the inventor suggested disclosure of the surface treatment, but his patent counsel elected not to disclose the non-claimed treatment because it was "'not part of the case'"[92] (i.e. not an element of any of the claims in the patent). Thus, the inventor's patent counsel failed to disclose a non-claimed chemical treatment of a claimed element wherein the treatment was "*necessary*" to ensure the satisfactory performance of the invention.[93] The CAFC concluded that the fact that the seal treatment was widely known in the prior art was no defense to the best mode violation. In other words, the fact that the seal treatment was not novel did not provide a best mode violation defense, in contrast to such rationale in

89. *See id.* at 590 n.*.
90. *Id.* at 586 (emphasis added).
91. Dana Corp. v. IPC Ltd. P'ship, 860 F.2d 415 (Fed. Cir. 1988).
92. *Id.* at 418.
93. *Id.* (emphasis in original).

Clayton. Specifically, the court opined that the "best mode requirement is not satisfied by reference to the level of skill in the art . . . ."[94]

In 1990, a panel of the CAFC decided *Chemcast Corp. v. Arco Industries Corp.*, which is significant in at least two respects.[95] First, the court implicitly advocated use of the necessity standard. In *Chemcast*, the undisclosed subject matter at issue was indeed claimed, albeit very broadly. It was dictum then, when the court opined that most best mode violations addressed by the CAFC had involved failures to disclose "*non*-claimed elements that were nevertheless *necessary* [to the invention]."[96] Therefore, the court implicitly conceded the use and validity of the necessity standard. Second, *Chemcast* is the case in which the current two-step best mode analysis originated, of which the first prong is key to this discussion. The court stated that the first prong of the inquiry "resolves whether the inventor must disclose any facts in addition to those sufficient for enablement."[97] This means that even the scope of the disclosure needed to satisfy the enablement requirement is not limited to the scope of the claims. This is true because methods of making and using an invention, per enablement, are not always claimed but they are always required to be disclosed. Therefore, the phrase in the *Chemcast* opinion stating "facts in addition to those sufficient for enablement"[98] necessarily includes those facts extending beyond enablement and, thus, also those facts extending beyond the scope of the claims. Therefore, in addition to the dictum, the first prong of *Chemcast* implicitly says that best mode disclosure necessarily requires subject matter beyond that which falls within the scope of the claims alone.

One year later, a panel of the CAFC regressed to the *DeGeorge* claims-only standard in *Engel Industries, Inc. v. Lockformer*.[99] There, no best mode violation was found where the inventor failed to disclose a non-claimed crimping procedure that was used to reinforce claimed snap-fit ductwork. The court could have found no best mode violation merely using the necessity rule, since the crimping procedure was not conclusively deemed necessary until commercialization, well after filing the patent application.[100] The court, however, went out of its way to find no best mode violation in commenting that "[u]nclaimed subject matter is not subject to the disclosure requirements of § 112."[101]

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94. *Id.* at 419.
95. *See* Chemcast Corp. v. Arco Indus. Corp., 913 F.2d 923 (Fed. Cir. 1990).
96. *Id.* at 928 (emphasis added).
97. *Id.*
98. *Id.*
99. Engel Indus., Inc. v. Lockformer, 946 F.2d 1528 (Fed. Cir. 1991).
100. *See id.* at 1532–33.
101. *Id.* at 1531.

A few months later, a completely different panel of the CAFC once again changed direction and disregarded the *DeGeorge* and *Engel* claims-only standard in *Wahl Instruments, Inc. v. Acvious, Inc.*[102] The panel stated that non-claimed materials and techniques used for manufacturing a claimed device "may or may not be required" to satisfy the best mode requirement.[103] Thus, if an inventor knows of a method of manufacture "which substantially improves the operation or effectiveness of his invention, failure to disclose such *peripheral development* may well lead to invalidation".[104]

In *Wahl*, the inventor failed to disclose information including a known molding technique using a known resin material to carry out the invention. The court found that such information "was no more than a routine manufacturing choice,"[105] and held as improper the trial court's summary judgment of failure to disclose the best mode. In distinguishing *Dana* on the facts, the *Wahl* court highlighted that the known, non-claimed technique in *Dana* affected *how well* the claimed invention worked, whereas the known and routine non-claimed matter in *Wahl* did not have such an effect.[106] Thus, in contemplating peripheral subject matter within the scope of best mode disclosure, *Wahl* did not employ the claims-only standard, but instead employed and qualified the necessity standard of *Dana*.

Several years later, a panel of the CAFC asked in *Zygo Corp. v. Wyko Corp.*, "[w]hat is a 'mode' of the 'invention'?" and "[w]hat [is] meant . . . by the phrase 'carrying out the invention'?"[107] The panel concluded that best mode inquiry is "set by the CLAIMS", per *Engel*.[108] The inventor in *Zygo* failed to disclose a non-claimed protective casing for his claimed interferometer. In applying the *Engel* claims-only standard to the facts of the case, the court stated that the non-claimed enclosure was not subject to best mode disclosure since it was "not a *necessary* part of this invention . . . ."[109] Despite citing the *Engel* claims-only standard, the term "necessary" implies that if the enclosure had been necessary, although still non-claimed, disclosure of the enclosure would have been required. As such, *Zygo* cited the claims-only standard as controlling, but applied the *Dana* necessity standard to the facts.[110]

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102. Wahl Instruments, Inc. v. Acvious, Inc., 950 F.2d 1575 (Fed. Cir. 1991).
103. *Id.* at 1579.
104. *Id.* (emphasis added).
105. *Id.* at 1580.
106. *See id.*
107. Zygo Corp. v. Wyko Corp., 79 F.3d 1563, 1567 (Fed. Cir. 1996).
108. *Id.*
109. *Id.* at 1568 (emphasis added).
110. *Id.*

Later in 1996, a panel of the CAFC attempted to broaden the scope of best mode disclosure to the extreme in its decision in *Great Northern Corp. v. Henry Molded Products, Inc.*[111] In assessing the requisite scope of best mode disclosure, the panel far exceeded the necessity standard by stating that the best mode issue that a court must determine is whether non-claimed features "*relate* to the claimed invention . . . ."[112] The court applied this new "relation" standard to the facts and found that non-claimed strengthening ribs that were formed into sheet material not only related to the claimed invention, but were "*critical* to practicing the claimed invention . . . ."[113] Thus, the panel originated a very broad "relation" standard, but then implicitly applied a narrower "criticality" standard to the facts in deciding the case based on critical, non-claimed elements. Because the term "critical" is closely synonymous with the term "essential"[114], the author suggests that *Great Northern* is best categorized with the cases employing the essentiality standard, including *Flick-Reedy*, *Bosy*, *International Telephone*, *Union Carbide*, and *Sherwood*.

In 1997, a panel of the CAFC invoked the necessity standard in *Robotic Vision Systems, Inc. v. View Engineering, Inc.* and thereby avoided the *DeGeorge* claims-only standard.[115] The panel found no best mode violation when the inventor failed to disclose software necessary for controlling a device where the software was not an element of the claims.[116] However, the panel said "the fact that the use of [something] is not mentioned in the claims . . . does not . . . exempt such use from the requirements of a best mode disclosure, since *carrying out the invention usually involves more than what is expressly claimed*."[117] Qualifying this statement further, the court concluded that one skilled in the art would have known that the undisclosed, non-claimed subject matter was the best mode of carrying out the invention. In other words, like Judge Rich in the *Nelson* case, the panel decided that non-claimed, but obvious, subject matter is *not* subject to explicit disclosure under best mode.

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111. Great N. Corp. v. Henry Molded Prod., Inc., 94 F.3d 1569 (Fed. Cir. 1996).

112. *Id.* at 1572 (emphasis added).

113. *Id.* (emphasis added).

114. MERRIAM-WEBSTER'S COLLEGIATE DICTIONARY 396 (10th ed.) (defining the term essential as "basic, indispensable, necessary"; MERRIAM-WEBSTER'S COLLEGIATE DICTIONARY 275 (10th ed.) (defining the term critical as "crucial, decisive . . . indispensable, vital . . . .").

115. Robotic Vision Sys. Inc. v. View Eng'g, Inc., 112 F.3d 1163 (Fed. Cir. 1997), *cert. denied*, 534 U.S. 1018 (2001).

116. *See id.* at 1165 ("We conclude that . . . the specification is not deficient concerning the disclosure of the best mode").

117. *Id.* at 1166 (emphasis added).

One year later, in *Applied Medical Resources Corp. v. U.S. Surgical Corp*, a panel of the CAFC qualified the necessity standard.[118] The *Applied Medical* panel stated that an inventor is not required to disclose a non-claimed element that is necessary to the operation of a larger-overall device in which the invention is deployed, but that is not necessary to the operation of the invention itself.[119] By implication then, best mode disclosure would be required for a non-claimed element that is *necessary* to the operation of just the invention itself. Thus, the *Applied Medical* panel employed and qualified the necessity standard.

Subsequent to the above decision, a couple of noteworthy district court cases applied the necessity standard. In 1999, the Federal District Court of Rhode Island interpreted CAFC standards of law on the requisite scope of best mode disclosure in *Access Solutions International, Inc. v. Data/Ware Development, Inc.*[120] The court held that specifically claimed elements are definitely subject to the best mode requirement and that non-claimed elements may also be subject to the best mode requirement if they are "*necessary* to implement the claimed invention."[121] The District Court found it important that the claimed invention simply would not function without the allegedly non-claimed element, thus implying that any element necessary to the utility of the invention, regardless if present in the claims, must be disclosed in detail to comply with the best mode requirement.

In 2000, the Federal District Court of New Jersey was inclined toward the claims-only standard of *Engel*, but ultimately applied a different standard in *Bristol-Myers Squibb Co. v. Boehringer Ingelheim Corp.*[122] The district court initially cited the claims-only standard of *Engel*, but then qualified it by invoking the necessity standard via a decision by its sister court in Rhode Island, stating that "[u]nclaimed elements, however, 'may also be subject to the [best mode] requirement if they are *necessary* to implement the claimed invention.' "[123] Toward the end of its analysis, the court finally explicitly followed the necessity rule, concluding that "the best mode defense is not confined to claim limitations."[124]

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118. Applied Med. Res. Corp. v. U.S. Surgical Corp., 147 F.3d 1374 (Fed. Cir. 1998), *cert. denied*, 524 U.S. 1104 (1999).

119. *See id.* at 1377.

120. *Access Solutions Int'l, Inc. v. Data/Ware Dev., Inc.*, 70 F. Supp. 2d 92 (D.R.I. 1999).

121. *Id.* at 98 (emphasis added).

122. Bristol-Myers Squibb Co. v. Boehringer Ingelheim Corp., 85 F. Supp. 2d 420 (D.N.J. 2000).

123. *Id.* at 422 (quoting *Access Solutions*, 70 F. Supp. 2d at 98) (emphasis removed).

124. *Id.*

Later in 2000, a CAFC panel decided *Northern Telecom Ltd. v. Samsung Electronics Co.*,[125] citing the claims-only standard of *Engel* and attempting to reconcile it with the necessity standard of *Dana*. The court first stated that "the contours of the best mode requirement are defined by the scope of the claimed invention . . ."[126] The court then attempted to distinguish *Dana* by stating:

> *Dana* [is] different from the present case because [it] involved a situation in which the omitted best mode *related* directly to the *claimed* invention . . . *Dana* [is] consistent with other decisions of this court in which we have held that nonclaimed matter that is *unrelated* to the operation of the claimed invention does not trigger the best mode requirement.[127]

By implication then, the panel was saying that if matter is related to the operation of the claimed invention, even if the matter is not claimed, it must be disclosed pursuant to the best mode requirement, consistent with other CAFC decisions.

In *Northern Telecom*, it was undisputed that the inventors failed to disclose a best mode for preventing a quality problem in fine-line etching of semiconductor material.[128] It was also not disputed that fine-line etching was preferred for producing semiconductors.[129] What *was* disputed was whether the claims were even drafted to cover producing fine-line semiconductors and, thus, whether it was necessary to teach the best mode to accomplish same. If the patentees did not dispute that they, like the rest of their industry, preferred fine-line etching, then the claims were necessarily drawn for fine-line etching since such was the inherent object of those in the art. Thus, the object in *Dana* (leak-free sealing) and the object in *Northern Telecom* (fine-line etching) were both indisputably preferred in their respective industries. If it was necessary to disclose best mode details to accomplish the non-claimed object of leak-free sealing in *Dana*, then it likewise should have been necessary to disclose the analogous best mode details to accomplish the non-claimed object of fine-line etching in *Northern Telecom*, as the District Court found. Instead, the panel applied the claims-only standard and found no best mode violation.

Later in 2000, in another noteworthy trial court case, the District Court of New Jersey declined to cite the preceding CAFC case, *Northern Telecom*, and instead relied on its own earlier pronouncement from

125. *N. Telecom Ltd. v. Samsung Electronics Co.*, 215 F.3d 1281 (Fed. Cir. 2000).
126. *Id.* at 1286.
127. *Id.* at 1288 (emphasis added).
128. *See id.* at 1287.
129. *See id.* at 1285.

Bristol-Myers Squibb.[130] The court stated that "best mode analysis is not strictly limited to claim limitations,"[131] and that "[a] best mode violation exists only when the undisclosed element affects how the invention works."[132] This is equivalent to saying that the best mode of an undisclosed element must be included if that undisclosed element is necessary to the intended operation of the invention. Thus, the court rebuked the claims-only standard and effectively applied the necessity standard.

In 2001, a different panel of the CAFC also passed on the opportunity to follow *Northern Telecom's* claims-only standard and instead employed the necessity standard in *Mentor H/S, Inc. v. Medical Device Alliance, Inc.*[133] Here, a majority of the judges of the panel invoked the necessity standard consistent with their own ruling in the previously decided *Applied Medical* case,[134] saying that the inventor is "only obliged to disclose unclaimed elements when they are *necessary* to the operation of the invention."[135] The *Mentor* panel reversed a finding of a best mode violation where an inventor failed to disclose stabilization circuitry that was important to carrying out a liposuction procedure as intended. The panel concluded that although the inventor admitted that the circuit was important, the inventor did not consider the circuit to be a necessary part of the invention.[136] Therefore the court held that the inventor need not disclose the unnecessary circuit to comply with the best mode requirement.

Later in 2001, another panel of the CAFC significantly narrowed the necessity standard in *Eli Lilly and Co. v. Barr Labs* by stating that non-claimed subject matter is not subject to best mode disclosure unless the non-claimed subject matter is not only necessary, but "*essential*" *and* "*novel*".[137] Incidentally, the terms "essential" and "novel" originally derive from the *Flick-Reedy* and *Clayton* decisions respectively.[138] The *Eli Lilly* standard, however, is effectively the same as that used in *Clayton.*[139]

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130. *See* SDS USA, Inc. v. Ken Specialties, Inc., 122 F. Supp. 2d 533, 548 (D.N.J. 2000).

131. *Id.* at 548.

132. *Id.* at 549.

133. Mentor H/S, Inc. v. Med. Device Alliance, Inc., 244 F.3d 1365 (Fed. Cir. 2001).

134. *Id.* at 1375.

135. *Id.* (emphasis added).

136. *See id.*

137. Eli Lilly and Co. v. Barr Labs, 251 F.3d 955, 963 (Fed. Cir. 2001) (emphasis added), *cert. denied*, 534 U.S. 1109 (2002).

138. *See* Flick-Reedy Corp. v. Hydro-Line Mfg. Co., 351 F.2d 546 (7th Cir. 1965), *cert. denied*, 383 U.S. 958 (1966); Clayton v. Akiba, 214 U.S.P.Q. (BNA) 374 (Pat. & Trademark Off. Bd. Pat. Intf. 1982).

139. *See Clayton*, 214 U.S.P.Q. (BNA) at 374.

The *Eli Lilly* panel upheld trial court findings of no best mode violations where the inventor failed to disclose the synthesization method of a disclosed intermediate compound and also failed to disclose the preferred solvent for the disclosed step of purifying the claimed invention, Prozac®.[140] The *Eli Lilly* panel attempted to reconcile the *Dana* case on the facts. At first glance, the *Dana* case seems factually analogous to *Eli Lilly* in that the inventor's patent in *Dana* was also questioned for non-disclosure of a chemical and a non-claimed pretreatment of a disclosed material. Here, unlike in *Dana*, the inventors in *Eli Lilly* at least disclosed the *presence* of the preferred chemical and the *presence* of the treatment or purification of the disclosed material. In any event, if the recent novelty and essentiality standard of *Eli Lilly* were retroactively applied to the facts of *Dana*, the patent in *Dana* would not have been invalidated for a best mode violation. This is because the chemical and surface treatment were indisputably not novel in the industry. Also, the *Eli Lilly* court, unlike the *Dana* court, permitted itself to reference the ordinary skill in the art when it stated that "one of ordinary skill in the art possessed the requisite knowledge to select a solvent [for purifying the claimed invention]."[141] Despite the panel's attempts to reconcile *Dana* to the present case, the standards of law that set the requisite scope of best mode disclosure have now reached a point of irreconcilability.

In June of 2002, the CAFC decided *Teleflex, Inc. v. Ficosa North America Corp.*,[142] which sustained the confusion and uncertainty surrounding the definition of the phrase best mode and the requisite scope necessary to comply with the best mode requirement. The *Teleflex* panel upheld summary judgment of no best mode violation, despite the fact that the inventor admitted that the *best way* to make his invention involved various *undisclosed* details regarding material selection and matching.[143] Counsel for the inventor successfully argued that the material details were only critical in meeting customer requirements and that the invention would work without such requirements.[144]

The problem here is that such an argument goes to enablement—not to best mode. Based on the definitions set forth above in section III, getting the invention to "work" is an enablement issue, whereas getting the invention to "work *better*" pertains to the degree of benefit that the invention provides, which is a best mode issue.[145] In other words, if the invention works better in the presence of certain material characteristics—

140. Prozac® is a registered trademark of Eli Lilly and Company.
141. *See Eli Lilly and Co.*, 251 F.3d at 966.
142. *Teleflex, Inc. v. Ficosa N. Am. Corp.*299 F.3d 1313 (Fed. Cir. 2002).
143. *Id.* at 1321.
144. *Id.* at 1322.
145. *See* Section III, *infra*.

and the inventor contemplated same at the time of filing—then such material details must be disclosed to satisfy the best mode requirement.

The *Teleflex* court held that because the best mode information involved unclaimed subject matter, there was no best mode violation.[146] The *Teleflex* panel expressed that their analysis of compliance with the best mode requirement "must begin and remain focused on the language of the claim."[147] Thus, the Court asserted that the best mode inquiry is effectively measured by the claims and cited cases that applied the claims-only standard, such as *Engel*, *Northern Telecom*, and *Christianson*.

The analysis, however, quickly diverged from the claim language by conceding that the CAFC has previously found violations of the best mode requirement regarding undisclosed, *unclaimed* subject matter when there is a "strong relationship" of such subject matter to the claimed invention.[148] Thus, the *Teleflex* analysis conceded that best mode analysis may transcend claim language, while at the same time attempting to apply what it perceived to be a claims-only standard. The court held that the best mode requirement was not violated where undisclosed information related to production details dictated by specific consumer requirements *and* did not fall within the scope of the claims.[149] The court left unresolved the issue of whether a best mode violation might occur where an inventor does not disclose non-claimed production details not mandated by the customer.

Based on the court's "strong relationship" language, the best mode requirement would be violated by a failure to disclose information that is more important than just a mere production detail—even though such information was not claimed. One might conclude that, despite the application of the claims-only standard, the real issue in *Teleflex* was not whether the undisclosed material details were within the claim language but, rather, whether such details bore enough of a "strong relationship" to the claim language beyond that of mere production details. Thus, *Teleflex* further illustrates that there remains plenty of uncertainty in assessing the scope of the best mode requirement.

Only two months after *Teleflex* was decided, the state of the best mode requirement worsened with *Bayer AG v. Schein Pharmaceuticals, Inc.*[150] The court created and applied yet another new standard of assessing the scope of best mode disclosure in holding that a patent was not invalid for failing to disclose preferred method steps in making ciprofloxacin, better known as Cipro®—the anthrax antibiotic.[151] Three primary steps were re-

146. *Id.* at 1330.
147. *Id.*
148. *Id.* at 1331.
149. *Id.* at 1333.
150. Bayer AG v. Schein Pharm., Inc., 301 F.3d 1306 (Fed. Cir. 2002).
151. Cipro® is a registered trademark of Bayer Akteingesellschaft Joint Stock Company.

quired to make Cipro®, including: 1) synthesis of a starting material, 2) chemical reaction of the starting material to yield an intermediate material, and 3) addition of an amine to the intermediate material to yield the end product Cipro®.[152] Neither step one nor the starting material itself were disclosed in the original patent application yet they were necessary to make the end product[153], and they were novel and indeed protected by a separate patent.[154]

In examining best mode case law, the court overlooked the precedent of *Nelson*, cited the strange CCPA decision of *Brebner* as the earliest statement on restricting best mode disclosure to that of the claims only,[155] and then invoked the *DeGeorge* claims-only standard set by the CAFC.[156] Nonetheless, the court attempted to reconcile the cases that have been decided using standards other than the claims-only standard.[157] In so doing, the court examined cases in which a best mode violation occurred and extracted a broad best mode standard. The court ruled that the best mode requirement is violated where one fails to disclose a preferred embodiment or where one fails to disclose a preference that materially affects the making or using of the invention—regardless of whether the subject matter falls within the bounds of the claims.[158]

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152. *See id.* at 1310.

153. *Id.* (The court stated that a "person of skill (sic) in the art" could have readily obtained the starting material by a routine search of the chemical literature, thereby implying that disclosure of step one was not necessary to carry out the invention. There are problems with this implication. First, the court failed to specify one of *ordinary* skill as the standard. Second, the inventor was a doctor in the art and a prolific inventor and thus obviously exceeded the level of ordinary skill, yet even he needed assistance from a co-inventor in order to make the claimed end-product. Up until the development of step one, the inventor could not produce ciprofloxacin. In other words, at the time the application was filed, but for the special assistance of his co-inventor with step one, the claimed end-product was out of reach of the inventor. Thus, the inventor's failure to disclose the novel, and apparently difficult, step one not only violated the best mode requirement, but also violated the enablement requirement. In fact, the *Brebner* opinion requires that "[a] method of making *starting materials not known in the art must* be set forth in order to comply with the enablement requirement." *In re* Brebner, 455 F.2d 1402, 1404 (C.C.P.A. 1972)).

154. *Bayer AG*, 301 F.3d at 1310 (U.S. Patent 4,439,620. Notably, the patents do not incorporate each other by reference even though the subject matter of the patents was developed together).

155. *Id.* at 1315.

156. *Id.* at 1315–19 (The court attempts to reconcile the *DeGeorge* claims-only standard with other cases that applied broader best mode standards, despite the fact that these standards are incompatible. Specifically, the court appears to reconcile the cases on the basis that cases decided using a non claims-only standard involved subject matter that "directly impacted" the invention. Arguably, then the court's new standard also requires disclosure of any subject matter having a direct impact on the claimed invention).

157. *Id.*

158. *See id.* at 1319 (cases where best mode requirement was not satisfied involved "either failure to disclose a preferred embodiment, or else failure to disclose a preference that materially affected making or using the invention").

In their analysis, the court first observed that the claims included only the end product ciprofloxacin and not the undisclosed starting material used in making the claimed invention.[159] Second, the court opined that the inventor's preferred way of making the intermediate had no material effect on the properties of the claimed end product.[160] Then, the court specifically held that a preferred method of making a claimed invention need not be disclosed to comply with the best mode requirement, if the preference does not "*materially affect* carrying out the invention."[161] Thus, *Bayer* did not apply the *DeGeorge* claims-only standard but, rather, applied a new "material effect" standard.

A concurrence to the majority opinion criticized the majority rationale for further complicating the best mode requirement[162] and opined that the best mode requirement did not compel disclosure in this case, simply on the basis that the undisclosed subject matter was an intermediate compound and not a claimed end product compound.[163] In support, the concurrence asserted *DeGeorge* and *Brebner* as binding precedent for a scope of the claimed invention rule (i.e. claims-only standard)[164] and further asserted that the CAFC uses a scope of the claimed invention standard.[165] While it is true that the CAFC uses such a standard, the CAFC also applies several other standards—thereby rendering compliance with the best mode requirement an unreasonably unpredictable exercise. Moreover, *DeGeorge* and *Brebner* are not binding precedent for the reason that Judge Rich's decision in the *Nelson* case is still valid as to the best mode issue decided therein and has not been overruled. Finally, the *Bayer* concurrence implicitly recognized the broken state of the best mode requirement in identifying several "imponderable questions" including "what is the test to identify a best mode—scope of the claimed invention, necessary relationship to performance of the claimed invention, or material effect on the properties of the claimed invention?"[166] As shown above, the best mode requirement continues to confound the best minds in patent law, which proves that the best mode requirement is not so easy to sort out and is deserving of an en banc hearing to set the record straight.

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159. *Id.* at 1313.

160. *Id.* at 1321.

161. *Id.* at 1323 (emphasis added).

162. *Id.* at 1324 (Rader, J., concurring) (stating that the majority "inexplicably and without support in the statute or case law, this *Bayer* opinion widens its best mode net to capture the properties of the claimed invention and further sweeps in any material effect or impact on those properties.").

163. *Id.* at 1323.

164. *Id.* at 1326 (discussing the "claimed-scope rule").

165. *Id.* at 1324.

166. *Id.* at 1328.

To summarize, the cases discussed above fit into seven different standards for assessing the disclosure needed to comply with the best mode requirement. The standards, which progressively broaden, include the "claims-only" standard,[167] the "essentiality" standard,[168] the "essentiality and novelty" standard,[169] the "necessity" standard,[170] the "necessary and nonobvious" standard,[171] the "material effect" standard,[172] and the "relation" standard.[173] Again, Diagram 2 of the Appendix should be a helpful guide in organizing these seven standards. Since there are so many different legal standards being applied, the scope of the best mode requirement is unsettled and uncertain.

C. *Classic Examples of the Paradox*

This section illustrates the uncertainty of the scope of the best mode requirement with two classic examples: software, and chemical treatments. As to the former, it is still unclear whether computer software needs to be disclosed in order to satisfy the best mode requirement. There are contradictory answers to this question, as shown below.

Some courts have ruled in favor of nondisclosure. *In re Sherwood* involved a sonogramming apparatus for evaluating seismic activity that

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167. *See* Teleflex, Inc. v. Ficosa N. Am. Corp., 299 F.3d 1313 (Fed. Cir. 2002); N. Telecom Ltd. v. Samsung Elec. Co., 215 F.3d 1281 (Fed. Cir. 2000); Engel Indus., Inc. v. Lockformer Co., 946 F.2d 1528 (Fed. Cir. 1991); Christianson v. Colt Indus. Operating Corp., 822 F.2d 1544 (Fed. Cir. 1987), *cert. granted*, 484 U.S. 985 (1987), *vacated*, 486 U.S. 800 (1988), *and transferred to* 870 F.2d 1292 (7th Cir. 1989); DeGeorge v. Bernier, 768 F.2d 1318 (Fed. Cir. 1985); Magdo v. Peltzer, 212 U.S.P.Q. (BNA) 838 (Pat. & Trademark Off. Bd. Pat. Intf. 1981), *aff'd in part and vacated in part by* Magdo v. Kooi, 699 F.2d 1325 (Fed. Cir. 1983).

168. *See* Great N. Corp. v. Henry Molded Prod., Inc., 94 F.3d 1569 (Fed. Cir. 1996); *In re* Sherwood, 613 F.2d 809 (C.C.P.A. 1980); Union Carbide Corp. v. Borg-Warner Corp., 550 F.2d 355 (6th Cir. 1977); Int'l Tel. & Tel. Corp. v. Raychem Corp., 538 F.2d 453 (1st Cir. 1976), *cert. denied*, 429 U.S. 886 (1976); *In re* Bosy, 360 F.2d 972 (C.C.P.A. 1966); Flick-Reedy Corp. v. Hydro-Line Mfg. Co., 351 F.2d 546 (7th Cir. 1965), *cert. denied*, 383 U.S. 958 (1966).

169. *See* Eli Lilly and Co. v. Barr Labs. Inc., 251 F.3d 955 (Fed. Cir. 2001), *cert. denied*, 534 U.S. 1109 (2002); Clayton v. Akiba, 214 U.S.P.Q. (BNA) 374 (Pat. & Trademark Off. Bd. Pat. Intf. 1982).

170. *See* Mentor H/S, Inc. v. Med. Device Alliance, Inc., 244 F.3d 1365 (Fed. Cir. 2001); Applied Med. Res. Corp. v. U.S. Surgical Corp., 147 F.3d 1374 (Fed. Cir. 1998), *cert. denied*, 524 U.S. 1104 (1999); Zygo Corp. v. Wyko Corp., 79 F.3d 1563 (Fed. Cir. 1996); Chemcast Corp. v. Arco Indus. Corp., 913 F.2d 923 (Fed. Cir. 1990); Dana Corp. v. IPC Ltd. P'ship, 860 F.2d 415 (Fed. Cir. 1988); Randomex, Inc. v. Scopus Corp., 849 F.2d 585 (Fed. Cir. 1988).

171. *See* Robotic Vision Sys., Inc. v. View Eng'g, Inc., 112 F.3d 1163 (Fed. Cir. 1997), *cert. denied*, 534 U.S. 1018 (2001); *In re* Nelson, 280 F.2d 172 (C.C.P.A. 1960), *overruled by In Re* Kirk, 376 F.2d 936 (C.C.P.A. 1967).

172. *See* Bayer AG v. Schein Pharm., Inc., 301 F.3d 1306 (Fed. Cir. 2002).

173. *See* Teleflex, Inc. v. Ficosa N. Am. Corp., 299 F.3d 1313 (Fed. Cir. 2002); N. Telecom Ltd. v. Samsung Elec. Co., 215 F.3d 1281 (Fed. Cir. 2000); Great N. Corp. v. Henry Molded Prod., Inc., 94 F.3d 1569 (Fed. Cir. 1996).

used a large-scale digital computer.[174] A patent examiner rejected the patent application for failing to disclose any computer hardware, flow charts, algorithms, or programs. The court, reviewing this rejection, found the existence of an enabling computer program as of the filing date of the invention that the applicant had concealed. The court held that the nondisclosure of this software in the application did not amount to a best mode violation since the specification provided general mathematical equations and since translation of these equations into machine language would be a "mere clerical function to a skilled programmer . . . ."[175] In employing this standard, the *Sherwood* court also concluded that a specific computer program that was contemplated by the inventor could be substituted by "the droning use of clerical skill."[176]

Three years later, the CAFC found a broader, enablement violation in *White Consolidated Industries, Inc. v. Vega Servo-Control, Inc.*[177] There, the inventor disclosed only the name of his proprietary software that was used to translate a universal numerical control language into machine code. The CAFC found that the mere reference to the proprietary software was insufficient and that the inventor should have disclosed the details of the proprietary software to comply with the enablement requirement. The failure to disclose the software inherently violated the best mode requirement since it violated the broader enablement requirement of which best mode is a partial subset.

In 1997, a panel of the CAFC reversed course again with the decision in *Fonar Corp. v. General Electric Co.*[178] There, the inventor failed to disclose software details used in a method of magnetic resonance imaging. The court ruled that best mode disclosure is satisfied by merely disclosing the functions of the software. Three months later two of the three *Fonar* panelists reinforced their commitment to the *Fonar* position in *Robotic Vision Systems, Inc. v. View Engineering, Inc.*[179] There the inventors failed to disclose software in a computer that was connected to the patented device for receiving input signals and for sending output signals. The court stated that the existence of software for running the computer was implicit in the specification, and that the details of any such software would be within the ordinary skill in the art. No disclosure was necessary.

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174. *In re* Sherwood, 613 F.2d 809 (C.C.P.A. 1980).

175. *Id.* at 817 n.6.

176. *Id.* at 816.

177. White Consol. Indus., Inc. v. Vega Servo-Control, Inc., 713 F.2d 788 (Fed. Cir. 1983).

178. Fonar Corp. v. Gen. Elec. Co., 107 F.3d 1543 (Fed. Cir. 1997), *cert. denied*, 522 U.S. 908 (1997).

179. Robotic Vision Sys., Inc. v. View Eng'g, Inc., 112 F.3d 1163 (Fed. Cir. 1997), *cert. denied*, 534 U.S. 1018 (2001).

As with software, it is unclear whether details about the chemical pretreatment of claimed elements are required to comply with the best mode requirement. In 1988, the CAFC held in *Dana*, discussed *supra*, that disclosure *was* required regarding a non-claimed chemical pretreatment of a claimed material.[180] There, a non-claimed fluoridating surface treatment yielded optimal wear resistance for a claimed rubber valve-stem seal, but such treatment was not disclosed in the patent application.[181] The CAFC invalidated the claims as not complying with the best mode disclosure requirement.[182]

In 1998, however, the CAFC reached exactly the opposite decision on almost identical facts in *Applied Medical Resources Corp. v. U.S. Surgical Corp.*[183] There, the inventors failed to disclose a non-claimed lubricant for pretreating claimed elastomers for improved tear resistance.[184] The nonclaimed lubricant was necessarily applied to various seal-forming elastomeric elements including a claimed valve and septum.[185] The CAFC upheld the validity of the claims and, thus on nearly identical facts, the CAFC employed incompatible and contradictory standards in *Dana* and in *Applied Medical*.

From the previous two examples and the preceding section, one can discern incompatible standards of law used to assess the requisite scope of best mode disclosure, including the claims-only standard,[186] the necessity standard,[187]

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180. Dana Corp. v. IPC Ltd. P'ship, 860 F.2d 415 (Fed. Cir. 1988).

181. *Id.* at 418.

182. *Id.* at 419.

183. Applied Med. Res. Corp. v. U.S. Surgical Corp., 147 F.3d 1374 (Fed. Cir. 1998), *cert. denied*, 524 U.S. 1104 (1999).

184. *Id.* at 1378.

185. *Id.* at 1379.

186. *See* N. Telecom Ltd. v. Samsung Elec. Co., 215 F.3d 1281 (Fed. Cir. 2000); Engel Indus., Inc. v. Lockformer Co., 946 F.2d 1528 (Fed. Cir. 1991); Christianson v. Colt Indus. Operating Corp., 822 F.2d 1544 (Fed. Cir. 1987), *cert. granted*, 484 U.S. 985 (1987), *vacated*, 486 U.S. 800 (1988), *and transferred to* 870 F.2d 1292 (7th Cir. 1989); DeGeorge v. Bernier, 768 F.2d 1318, 1324–25 (Fed. Cir. 1985); Bristol-Myers Squibb Co. v. Boehringer Ingelheim Corp., 86 F. Supp. 2d 433 (D.N.J. 2000); Magdo v. Peltzer, 212 U.S.P.Q. (BNA) 838 (Pat. & Trademark Off. Bd. Pat. Intf. 1981), *aff'd in part and vacated in part by* Magdo v. Kooi, 699 F.2d 1325 (Fed. Cir. 1983).

187. *See* Mentor H/S, Inc. v. Med. Device Alliance, Inc., 244 F.3d 1365 (Fed. Cir. 2001); Applied Med. Res. Corp. v. U.S. Surgical Corp., 147 F.3d 1374 (Fed. Cir. 1998), *cert. denied*, 524 U.S. 1104 (1999); Great N. Corp. v. Henry Molded Prod., Inc., 94 F.3d 1569 (Fed. Cir. 1996); Zygo Corp. v. Wyko Corp., 79 F.3d 1563 (Fed. Cir. 1996); Wahl Instruments, Inc. v. Acvious, Inc., 950 F.2d 1575 (Fed. Cir. 1991); Chemcast Corp. v. Arco Indus. Corp., 913 F.2d 923 (Fed. Cir. 1990); Dana Corp. v. IPC Ltd. P'ship, 860 F.2d 415 (Fed. Cir. 1988); Randomex, Inc. v. Scopus Corp., 849 F.2d 585 (Fed. Cir. 1988); *In re* Sherwood, 613 F.2d 809 (C.C.P.A. 1980); Union Carbide Corp. v. Borg-Warner Corp., 550 F.2d 355 (6th Cir. 1977); Int'l Tel. & Tel. Corp. v. Raychem Corp., 538 F.2d 453 (1st Cir. 1976), *cert. denied*, 429 U.S. 886 (1976); *In re* Bosy, 360 F.2d 972 (C.C.P.A. 1966); Flick-Reedy Corp. v. Hydro-Line Mfg. Co., 351 F.2d 546 (7th Cir. 1965), *cert. denied*, 383 U.S. 958 (1966).

and various other standards.[188] In reviewing the case law, the CCPA and CAFC have applied the claims-only standard in only four cases whereas they have applied a broader standard in at least twelve cases.[189] In any case, the great weight of CAFC cases thus favor use of a standard that is broader than claims-only.

The incompatibility between the standards is manifested in the following quotes from two of the cases cited above. The CAFC has said, "[unclaimed] subject matter is not subject to the disclosure requirements of § 112; the reasons are pragmatic: the disclosure would be boundless, and the pitfalls endless."[190] In contrast, the CAFC has also more recently said "the fact that the use of [something] is not mentioned in the claims . . . does not . . . exempt such use from the requirements of a best mode disclosure, since carrying out the invention usually involves more than what is expressly claimed."[191] By now it should be evident that the best mode cases are irreconcilable on the definition of best mode and with respect to the standard of requisite scope of best mode disclosure.

V. CONCLUSIONS

A. *Generally*

The best mode disclosure requirement is currently a disservice to U.S. patent law because the scope of the disclosure required to comply therewith is erratically defined by the courts. As explored above, the phrase "best mode" basically means the inventor's preferred embodiment *and* preferred method of making and using that embodiment. The courts, however, have failed to consistently define and set the scope of the best mode requirement, such that compliance with the best mode requirement currently presents a guessing game for patent practitioners and inventors.

Compliance with the best mode requirement is so unclear that it has repeatedly prompted commentators to call for reform. One pair of commentators have suggested well over a dozen rules for defining the

188. *See* Eli Lilly and Co. v. Barr Labs. Inc., 251 F.3d 955 (Fed. Cir. 2001), *cert. denied*, 534 U.S. 1109 (2002); Robotic Vision Sys., Inc. v. View Eng'g, Inc., 112 F.3d 1163 (Fed. Cir. 1997), *cert. denied*, 534 U.S. 1018 (2001); Clayton v. Akiba, 214 U.S.P.Q. (BNA) 374 (Pat. & Trademark Off. Bd. Pat. Intf. 1982); *In re* Nelson, 280 F.2d 172 (C.C.P.A. 1960), *overruled by In Re* Kirk, 376 F.2d 936 (C.C.P.A. 1967).

189. The four cases are *DeGeorge*, *Engel*, *Northern Telecom*, and *Teleflex*. Arguably, *Christianson* is a fifth claims-only case, but the case was transferred away from the CAFC. Thus, four is probably the correct number.

190. *Engel*, 946 F.2d at 1531.

191. *Robotic Vision*, 112 F.3d at 1166.

contours of the best mode requirement,[192] but, unfortunately, a litany of legal rules would be difficult for even an experienced practitioner to reconcile and apply. And even if such an abundance of legal rules could be reconciled, it would be appropriate to do so only as a *legal* exercise by a patent practitioner and would not be appropriate as a *technical* exercise by an inventor. In any case, it is the inventor—not the inventor's attorney—who is accountable for, and in the position to control, the dissemination of technical best mode details about the invention.[193] The inventor is not a patent practitioner and should not be required to follow the litany of legal rules. Instead, what is needed is a single, simple standard for inventors to rely upon in attempting to comply with their obligation to disclose the best mode of their invention.

Another commentator noted that the CAFC has inconsistently dealt with the requisite scope of best mode disclosure and has advocated a different approach, using a single, bright-line claims-only standard as the "least troubling" method of ascertaining the required scope of best mode disclosure.[194] Just last year, yet another commentator recognized the continuing inconsistency in the standard of law that plagues the best mode requirement and similarly recommended use of the claims-only standard.[195] Unfortunately, as we have seen, the claims-only standard is too restrictive, is incompatible with the statutory requirement, and forsakes the historical basis of the best mode requirement.

Under modern patent jurisprudence since 1952, the required scope of best mode disclosure has not yet been addressed by the United States Supreme Court, nor has it ever been addressed by the CAFC sitting *en banc*. Thus, there exists a quiver of contradictory standards of law from which trial and appellate courts can select many different arrows to shoot at either side of a best mode compliance debate. In other words, the definition and scope of the best mode requirement remains well *un*settled. The unsettled definition and scope of the best mode disclosure requirement weakens U.S. patent enforcement by subjecting inventors to the costs of overcompliance or risks of undercompliance with the requirement.

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192. Roy E. Hofer & L. Ann Fitzgerald, *New Rules for Old Problems: Defining the Contours of the Best Mode Requirement in Patent Law*, 44 AM. U. L. REV. 2309 (Summer 1995).

193. *See* Glaxo Inc. v. Novopharm Ltd., 52 F.3d 1043, 1052 (Fed. Cir. 1995) ("An agency relationship may exist during prosecution before the PTO where the patent attorney is acting on the inventor's behalf . . . . An agency relationship does not exist, however, with respect to what an inventor must disclose in order to obtain a patent on his invention, which includes, of course, any best mode under § 112."), *cert. denied*, 516 U.S. 988 (1995).

194. Christopher S. Marchese, *Confusion, Uncertainty, and the Best Mode Requirement*, 2 FED. CIR. B.J. 1, 66 (Spring 1992).

195. *See* Franzinger, *supra* note 35.

B. *Costs of Overcompliance*

The costs of overcompliance are relatively straightforward to understand. An inventor will need to spend hours of unproductive time scouring through documentation of her various development projects to be sure to include every possible detail related to the invention. Then, the inventor's attorney will need to spend a commensurate amount of time sorting out all of the extraneous disclosure and drafting an excessively and needlessly long patent application, just to be sure to comply with the most conservative interpretation of the best mode requirement.[196]

C. *Risks of Undercompliance*

The risks of undercompliance with the requirement are relatively more complicated. An inventor's failure to understand the definition and scope of best mode may lead to noncompliance with the requirement and thereafter 1) denial of the patent grant during patent prosecution, 2) invalidation of a broad claim, 3) possible invalidation of the entire patent or patent portfolio, and 4) other state and federal liability.

During prosecution of a patent application, it is possible that the United States Patent and Trademark Office (hereinafter "USPTO") would reject the patent application based on a lack of best mode disclosure. Such rejection, however, is unlikely since the USPTO must assume that the best mode has been disclosed absent evidence to the contrary.[197] Such evidence, however, might emerge during prosecution of the application, perhaps in a technical argument to the examiner, in an affidavit, or, more likely, based on the new rule that permits an examiner to request additional information from an inventor.[198] There is one other remote possibility that an inventor might be denied her patent with regard to best mode disclosure. A foreign inventor might be denied if she refuses to provide an "indication" of the best mode, as required of foreign applications filed via the Patent Cooperation Treaty.[199] This requirement is probably more a matter of form than substance since it typically just involves titling the detailed description section of the patent application with the words "Description of Best Mode". Interestingly, however, inventors are not supposed to be required to ex-

196. *See* Marchese, *supra* note 194, at 61.

197. Manual of Patent Examining Procedure § 2165.03, U.S. Patent and Trademark Office, U.S. Dep't. of Commerce (Original Eighth Edition, August 2001).

198. 37 C.F.R. § 1.105 (2000) (describing the requirements for information: "[E]xaminer . . . may require the submission . . . of . . . information as may be reasonably necessary to properly examine or treat the matter . . . .").

199. 37 C.F.R. § 1.435(b) (1998) ("In international applications designating the United States the description must contain upon filing an indication of the best mode contemplated by the inventor for carrying out the claimed invention.").

plicitly indicate their best mode.[200] The more likely situation is that the examiner will not have access to any solid evidence of a lack of a best mode, and such a defect would probably lie dormant until litigation or other adversarial proceedings reveal it during discovery procedures.

During discovery procedures, if alleged infringers discover evidence that the inventor concealed her best mode, then they will likely be able to invalidate at least some of her patent claims. The law does not care whether an inventor has intentionally or unintentionally concealed her best mode, since an inventor's accidental omission of best mode disclosure will suffice to invalidate the related claims.[201] Alleged infringers may invalidate claims by discovering evidence in the inventor's lab notes, e-mail correspondence, drafts of technical papers, etc., in which the inventor contemplated various modes that were not ultimately disclosed in her patent application. Also, the alleged infringers can elicit similar verbal testimony under oath at a deposition or on the stand at trial. Regrettably for the inventor, the best mode issue is a question of fact, potentially in front of a jury at trial. There, the alleged infringers can parade details in front of the jury relating to the various undisclosed modes from the inventor's documentation of her development project. Unfortunately, all that the alleged infringers may need to do to invalidate a targeted claim is to get sympathy from the jury that the inventor knew much more about carrying out the invention than the inventor disclosed in her patent application. A jury may well believe that the invention works better with the undisclosed information and that there is no way that the inventor could not have contemplated that fact, and thus find against the inventor. From a patentee's perspective, what could be worse?

For starters, the alleged infringers could render the entire patent unenforceable because the inventor neglected to include details that affected each and every claim in the patent. The stakes get higher if the alleged infringers produce convincing evidence of inequitable conduct by the inventor, after which the inventor's entire patent or patent portfolio can be rendered invalid.[202] This guilt-by-association rule arises if the inventor is found to have intentionally, rather than just accidentally,

200. *See* Ernsthausen v. Nakayama, 1 U.S.P.Q.2d 1539, 1549 (Bd. Pat. App. & Inter. 1985) ("There is no requirement in 35 U.S.C. § 112 that an applicant point out which of his embodiments he considers his best mode").

201. *See* DeGeorge v. Bernier, 768 F.2d 1318, 1324 (Fed. Cir. 1985) (Not complying with best mode requirements amounts to concealing the preferred mode contemplated by the applicant at the time of filing.); *see also* Union Carbide Corp. v. Borg-Warner Corp., 550 F.2d 355 (6th Cir. 1977).

202. *See* Consol. Aluminum Corp. v. Foseco Int'l, Ltd., 910 F.2d 804 (Fed. Cir. 1990) (stating that related patents being enforced in the same cause of action are subject to being held unenforceable).

concealed the best mode. At this point, the inventor will also be accountable for the adversary's attorney's fees.[203]

Worse yet, the inventor's inequitable conduct may bring about other state and federal charges. *Any* person—not just the alleged infringer—who is injured by the inventor's willful inequitable conduct concerning highly material information may sue the inventor under state unfair competition laws or federal antitrust laws under which an inventor can be exposed to treble damages.[204] Also, the inventor's willful, inequitable conduct in procuring a patent may also amount to a Federal Trade Commission violation.[205] From the above, one can see that there are many significant risks in failing to fully disclose the best mode of an invention.

VI. RECOMMENDATIONS

From the discussion above, it should be clear that the current condition of the best mode requirement is unacceptably unpredictable, and thereby leads to unreasonable costs and risks in U.S. patent law. Therefore, at the next available opportunity the CAFC should remedy the problems with the best mode requirement, via a ruling *en banc*. In the alternative, the best mode requirement should be sacrificed and used as a bargaining chip during future negotiations to harmonize international patent law. In the meantime, however, inventors are well advised to "overcomply" with the best mode requirement since the risks of undercompliance far outweigh the costs of overcompliance.

A. *Judicially Repair the Broken Best Mode Requirement*

The best mode disclosure requirement needs to be completely revisited in definition and scope by the CAFC sitting *en banc* since it is subject to the unpredictable application of a flawed two-step analysis and too many conflicting standards of law. The definition of best mode and the scope of best mode disclosure are not at all settled. Such unpredictability permits courts to employ at will a variety of contradictory and incompatible standards of law.

The *Chemcast* two-step analysis is flawed because both prongs are impractical. The first prong asks whether the inventor contemplated a

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203. *See* Fox Indus., Inc. v. Structural Pres. Sys., Inc., 922 F.2d 801, 804 (Fed. Cir. 1990).

204. *See* Walker Process Equip., Inc. v. Food Mach. & Chem. Corp., 382 U.S. 172, 175–76 (1965).

205. *See* Donald S. Chisum, *Best Mode Concealment and Inequitable Conduct in Patent Procurement: A Nutshell, A Review of Recent Federal Circuit Cases and a Plea for Modest Reform*, 13 SANTA CLARA COMPUTER & HIGH TECH. L.J. 277, 306 n.134 (1997).

best mode. The practical reality of inventing is such that the answer to the first prong is probably always affirmative. It is difficult to imagine a situation where an inventor does not at least passively contemplate some better or best mode of her invention at the time of filing. For example, in the case where an inventor has only one mode, that one mode is necessarily the best because there is no other, and surely the presence of one mode is better than no mode at all. In the case where the inventor has multiple modes, it is hard to imagine a scientist, engineer, technician, or tinkerer that has absolutely no opinion at all as to which of her discovered modes is better than the others. Speaking from experience, inventors are, by their very nature, analytical folks who tend to overanalyze the pros and cons of different variations of their inventive subject matter as they develop their invention. Hence the familiar phrase arose that during project development there inevitably comes a time to "shoot the engineer." This is because the engineer is constantly assessing the value of the invention, tweaking it, and is thus continuously seeking better and better modes of her invention. Thus, the real world answer to the first inquiry is probably always yes, and therefore the first inquiry should be abolished, or at least deemed presumptively met to be rebutted by an alleged infringer.

The second prong of the *Chemcast* test is basically circular since it confuses the relationship between enablement and its partial subset, best mode. The second prong asks whether the disclosure is adequate to *enable* one skilled in the art to practice the *best mode*. In light of the contrasts described in Section III, particularly between mode and enablement and between mode and embodiment, it would be more accurate to ask a different question. That is, whether the disclosure accurately teaches one of ordinary skill in the art what the inventor considers to be the best manner of making and using what the inventor considers to be her best embodiment. To correct these problems, the CAFC sitting *en banc* should replace the *Chemcast* analysis with the preceding inquiry, or with some other analysis that is consistent with the statutory disclosure provision.

The claims-only standard is also flawed because it does not square with the plain language interpretation of the statute as was discussed above. Best mode means the manner in which something is done to yield the greatest usefulness intended, which is necessarily broader than just those elements explicitly claimed. As we have confirmed previously, enablement disclosure is not limited to the scope of the claims. To fully enable an invention, many non-claimed details often must be disclosed, such as special tools and special methods of making the invention. As shown in Diagram 1 of the Appendix, best mode is a partial subset of

enablement and, like enablement, best mode compliance requires disclosure of non-claimed details.

Moreover, the claims-only approach requires an inventor to predict and construe the scope of the claims. Again, inventors, not attorneys are ultimately responsible for compliance with the best mode requirement. In other words, the inventor has to know what is within the scope of the claims to know what to disclose to comply with the best mode requirement. Since inventors are not typically equipped to perform claim construction, it is unfair and illogical to hold them accountable for doing so.

The necessity standard is not perfect, but it better comports with the plain language interpretation of the best mode requirement and is the majority rule in a vast number of the best mode cases that assess the requisite scope of the best mode requirement. Like the plain language definition of best mode, the necessity standard involves subject matter outside the scope of the claims whereas the claims-only standard inherently does not. The majority standard applied in the cases cited herein is the collective necessity/essentiality standard.[206] For all intents and purposes, the term "essential" is close enough in definition to the term "necessary" for the essentiality and necessity standards to be combined. After all, "essential" is defined as "basic, indispensable" and "necessary".[207] Therefore, the claims-only standard should be permanently set aside in favor of the necessity standard or some qualified version of the necessity standard.

B. *Or, Legislatively Sacrifice Best Mode as a Harmonization Bargaining Chip*

If higher judicial authority is unable to remedy the problems with the best mode disclosure requirement, then perhaps the legislature should sacrifice the requirement as a bargaining chip during future negotiations to harmonize international patent laws. There may be nothing to lose in such a case since the current state of best mode is a great disservice to U.S. patent law. If, however, the CAFC or the Supreme Court elected to remedy the unstable and unpredictable best mode requirement, then the public stands to benefit therefrom.[208]

From a "marketing" perspective, the best mode requirement is unpopular. Many foreign jurisdictions do not have a best mode

206. *See supra* Section IV.C.

207. MERRIAM-WEBSTER'S COLLEGIATE DICTIONARY 396 (10th ed. 2002) (defining the term "essential"), *available at* http://www.m-w.com.

208. *See* Jerry R. Selinger, *In Defense of "Best Mode": Preserving the Benefit of the Bargain for the Public*, 43 CATH. U.L. REV. 1071 (1994).

requirement, including the European Patent Office and Japan. Thus, many foreign "customers" of the USPTO would undoubtedly prefer to abolish the best mode requirement. Likewise many domestic "customers" and "agents" of the USPTO have already explicitly advocated the abolishment of the best mode requirement, including the Intellectual Property Owners Association and the American Intellectual Property Lawyer's Association.[209] Between these foreign and domestic "customers" lies perhaps the largest customer base of the USPTO. As the old adage goes, "the customer is always right," and so what the customer wants, the customer tends to get. Therefore, regardless of the merits of abandoning the best mode requirement, we should probably expect to see it abolished.[210] The very least we can do, however, is to preserve the best mode requirement long enough to use it as leverage during negotiation with other countries during patent harmonization efforts. In other words, the best mode requirement could be surrendered to protect a possibly more treasured aspect of U.S. patent law, such as the first-to-file concept.

Perhaps, however, not all would be lost in giving up the best mode requirement since there remain strong, inherent incentives for inventors to disclose their best mode. First, as Professor Chisum has noted, "[t]he priority rules on patent rights create ample incentives for inventors to disclose valuable 'best modes,' even if there were no best mode requirement."[211] There is also an ever-present danger in omitting any mode, particularly your best, which has commercial value. This is because a competitor can later file an application covering the specific omitted mode, thereby forcing the original inventor to cross-license it back.[212] Nonetheless, for giving up such significant consideration in the US patent bargain, not to mention centuries of legal effort and evolution in refining the best mode requirement, we would be remiss if we didn't replace it with stricter scrutiny of compliance with other statutory disclosure requirements.

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209. *See* Request for Comments on the International Effort to Harmonize the Substantive Requirements of Patent Laws, 66 Fed. Reg. 15,409 (U.S. Patent and Trademark Office, U.S. Dep't of Commerce, March 12, 2001); *see also* Comments Regarding the International Effort to Harmonize the Substantive Requirements of Patent Laws (May 2001) (responding to the above cited request for comments) *at* http://www.uspto.gov/web/offices/dcom/olia/harmonization/.

210. *See* Franzinger, *supra* note 35, at 181.

211. Chisum, *supra* note 205, at 318 n.186; *see also* Bayer AG v. Schein Pharm., Inc., 301 F.3d 1306, 1325 (Fed. Cir. 2002) (Rader, J., concurring) (proffering that the best mode requirement is self-enforcing).

212. Chisum, *supra* note 205, at 318 n.186; *Bayer AG*, 301 F.3d at 1325.

C. *Meanwhile, How to Comply with the Requirement to Ensure Patent Reliability*

Until the problems with best mode are corrected or the requirement beneficially sacrificed, inventors should err on the side of excessive disclosure to avoid having their patent invalidated for noncompliance with the best mode requirement. In other words, despite the increased costs of doing so, inventors should overcomply with the best mode requirement to be sure that an alleged infringer couldn't show a jury the litany of differences between the inventor's project documentation and her patent application disclosure. Any differences give a court an opportunity to exploit the uncertainty in the law against the inventor. The following general and specific recommendations are aimed at suggesting how best to comply with best mode disclosure requirement for maximum patent enforcement reliability, despite the unsettled situation of the law.

Generally, a prospective patentee should first ask herself what she has to lose and what she has to gain by not disclosing all documented details related to her invention. At worst, and as discussed above in Section V, a patentee could potentially be found guilty of violating federal law if she intentionally concealed her best mode. At best, she might preserve for herself a trade secret, but the disclosure in the patent might facilitate a competitor to detect the best mode anyway, thereby defeating the purpose of concealing the trade secret. Thus, although the costs to overcomply are high, the risks in undercomplying are even higher and the opportunities uncertain in not thoroughly disclosing all documented details in the patent application.

And so, a patentee should not be coy or conservative in communicating the documented details of her invention. As a rule of thumb, if an inventor has documented a detail relating to her invention, she should disclose it, regardless if it is a detail within the ordinary skill in the art. Even under the broader necessity standard, an inventor need not identify every last detail, but if she has documented the detail she would be wise to disclose it, since an alleged infringer will probably discover it during litigation and attempt to show it to a jury. An inventor should disclose all the details that she has and tell her attorney what she thinks she wants protected since the attorney should be able to discern through an interview what details should be protected. If an inventor has concerns about elements of trade secrecy, she should explicitly raise this issue with her attorney.

Disclosing all of the documented details of an invention may take extra time, but should not entail any capital expense. Compliance does not require testing or elaborate investigative work. It merely requires an inventor to share such information to the extent that she already contem-

plates it and that it teaches a better way of carrying out the invention. All it may cost is a little lengthier disclosure of information that an inventor already has, but is now obligated to share.

More specifically, what follows are some fairly reliable rules of thumb for a patentee to consider when drafting a disclosure document. First, there is no affirmative obligation to disclose a specific working example.[213] As one court put it, "the absence of a specific working example is not necessarily evidence that the best mode has not been disclosed, nor is the presence of one evidence that it has."[214] Accordingly, a patentee need not expend any extra efforts to develop a product or process specifically to satisfy the best mode requirement.

Second, a patentee should always disclose the source of their materials, processes, and equipment used in carrying out the invention. Sources include names of suppliers, distributors, trade names, product numbers, etc. If a patentee chooses and documents a particular source of a material of the invention, it is hard to argue that the patentee did not contemplate that source as the best alternative or at least that the patentee preferred the source.

As a fun example, assume that an inventor has just developed an apparatus for removing acid deposits from terminal posts of a car battery. Assume also that the inventor discovered during project development that using a carbonated soft drink yields better results. More specifically, a cola, namely Coca-Cola®,[215] yields the best results. Therefore, the patentee would be required to identify the use of any generic cola to satisfy the enablement requirement and to more specifically identify Coke®[216] to satisfy the best mode requirement. The inventor would not, however, be required to disclose the Coke® chemical formula.[217] So, even if the Coca-Cola® company were the patentee they would be able to preserve the trade secrecy of their secret formula.

Third, a patentee should plan the timing of her development, disclosure, and application for a patent very carefully. A patentee need only disclose those best mode details known to her at the time of filing her patent application, and not thereafter, since a patentee need not update her application with a later-discovered best mode.[218] Simply put,

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213. *See In re* Gay, 309 F.2d 769, 774 (C.C.P.A. 1962).

214. *In re* Honn, 364 F.2d 454 (C.C.P.A. 1966).

215. Coca-Cola® is a registered trademark of The Coca-Cola Company.

216. Coke® is a registered trademark of The Coca-Cola Company.

217. *See generally* Randomex, Inc. v. Scopus Corp., 849 F.2d 585 (Fed. Cir. 1988) (holding that the disclosure of the trade name, but not the formula, of a cleaning solution used in the claimed invention was sufficient for best mode purposes); *see also* Int'l Tel. & Tel. Corp. v. Raychem Corp., 538 F.2d 453 (1st Cir. 1976), *cert. denied*, 429 U.S. 886 (1976).

218. *See* Engel Indus., Inc. v. Lockformer Co., 946 F.2d 1528 (Fed. Cir. 1991).

if an inventor does not have best mode details as of filing, then she cannot be held accountable for disclosing them. If an inventor wants to avoid disclosing certain best mode details, then she should avoid discovering and developing such details until after filing her patent application. Similarly, if an inventor does not want to share the results of testing of her invention, then she should not test it until after filing her patent application. After filing her application and developing better modes, she should re-evaluate whether she wants to patent those modes or preserve them as trade secrets. As authority for this third rule of thumb, *Glaxo Inc. v. Novopharm Ltd.* is precedent for purposely, but legally, circumventing the best mode requirement.[219]

Finally, an inventor should not develop improvements to her invention between the time when she reviews and signs off on the application and when the application is filed. If an inventor plans to maintain any further development refinements as trade secrets, it is especially important to break off all development of her invention during the preparation of her patent application, i.e., between the time she discloses her initial invention to her patent attorney and the time the application is filed. Ongoing development documentation of improvements to your initial invention during that time may be difficult or impossible to timely capture in the patent application and thus may be a smoking gun for an opponent to uncover during discovery. The following example illustrates some of the problems described above.

In *Graco, Inc. v. Binks Manufacturing Co.*, joint inventors invented a first patent application covering an improved industrial pump.[220] Before filing the first patent application, one of the joint inventors invented an improved seal for the pump and requested the preparation of a second patent application covering a further improved pump using the improved seal.[221] Neither inventor disclosed the improved seal in the first patent application but waited until the filing of the second application to disclose it. This is a classic best mode violation, simply because the inventors were obligated to disclose the improved seal in the first pump patent application since it was known to them as of the filing date of their application. Incidentally, an inventor's failure to disclose the best mode cannot be cured after filing the application.[222]

Here are few other miscellaneous observations on complying with the best mode requirement. 1) If an invention requires any kind of re-

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219. *See* Glaxo Inc. v. Novopharm Ltd., 52 F.3d 1043 (Fed. Cir. 1995) (holding no obligation on assignee to share knowledge of optimum details with inventor), *cert. denied*, 516 U.S. 988 (1995).

220. 60 F.3d 785 (Fed. Cir. 1995).

221. *Id.* at 787.

222. *See In re* Hay, 534 F.2d 917 (C.C.P.A. 1976).

finement techniques, such as calibration or initialization routines, then it is wise to disclose them even if such procedures are known in the art. Chances are, such tweaking techniques inherently permit better operation of the invention and are thus susceptible to best mode scrutiny. 2) It is not settled whether best mode disclosure is limited only to embodiments, and the methods of making and using those embodiments. In other words, best mode disclosure may be subject to how the invention is best employed. For example, assume that an inventor contemplates at the time of filing her application that her internal combustion engine runs best *using* gasoline and it is best *employed* as a power plant for generating electricity rather than as a prime mover of an automobile. Employment of her invention may be viewed as a subset of a manner of using her invention and she may be obligated to disclose such employment.

VII. SUMMARY

The definition of the best mode requirement of U.S. patent law is unclear and the scope unstable. Instability in the scope of the best mode requirement leads to great expenses incurred in overcomplying with the statute and to even greater risks in undercomplying with the statute. Such unnecessary expenses and risks are a great disservice to the patent system. Therefore, the best mode requirement desperately needs to be stabilized by an *en banc* ruling of the CAFC. In the alternative, the best mode requirement should be beneficially sacrificed as a bargaining chip during negotiations with other countries in furtherance of international patent law harmonization efforts. In the meantime, however, inventors are advised to disclose everything important enough to have been documented during the project development phase of their invention process.

APPENDIX

DIAGRAM 1
35 U.S.C. 112
BEST MODE: THE INTERSECTION OF THE DESCRIPTION AND ENABLEMENT REQUIREMENTS

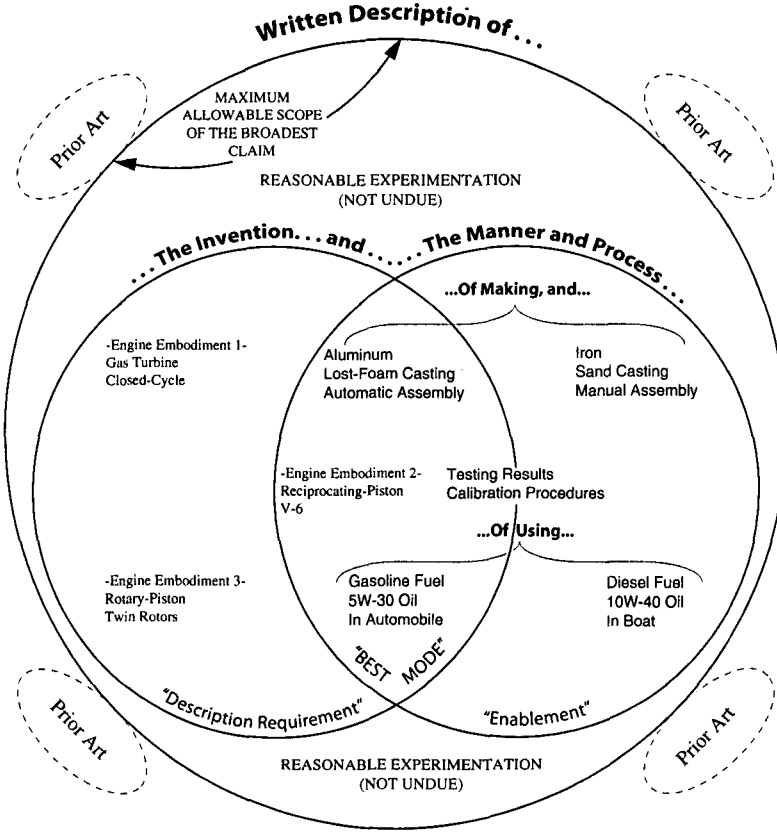
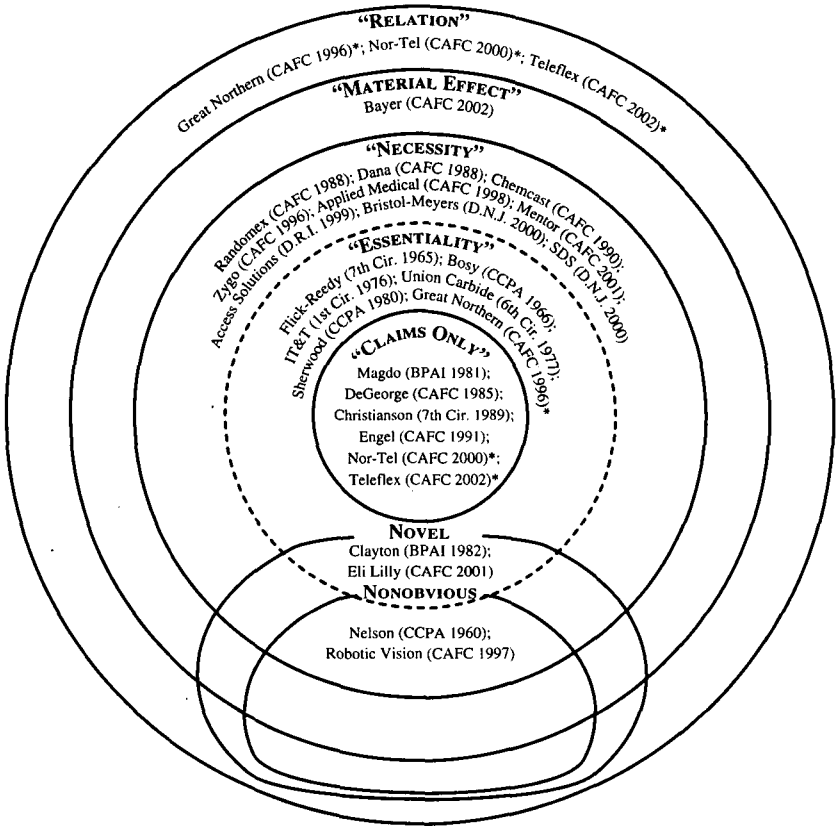


DIAGRAM 2
SCOPE OF STANDARDS FOR ASSESSING THE REQUISITE DISCLOSURE TO SATISFY THE BEST MODE REQUIREMENT



*Cases where the court *identified* one standard as law, but *applied* a different standard to the facts.