Drafting the Patent Specification

Kenneth N. Nigon
2009-07-23

The current corporate and legal environments place conflicting requirements on patent practitioners. First, due to increasing scrutiny on the corporate bottom line, patent applications need to be prepared as cost-effectively as possible. Second due to decreasing levels of civility in patent trials and the increasing burden being placed on practitioners by the courts, applications need to be prepared as carefully as possible.

It is no secret that the number of patent lawsuits is increasing and that corporations around the world are increasingly aware of the value of patents. While the claims are the grist of these lawsuits, the patent specification more and more often determines their meaning. This should not be difficult to understand, especially in the electronic and computer arts because patent applications for these inventions typically cover processes using method claims and claims having functional language even if they are not in means-plus-function form. The scope of these types of claims often depends on the corresponding functions and apparatus described in the patent specification. While the Federal Circuit[i] and the U.S. Patent and Trademark Office (PTO)[ii] have different standards as to what claim language may be needed to invoke an analysis of the claim in view of the specification, it is clear that the apparatus and steps described in the specification can be important for many types of claims.

Thus, the description of an invention in the electronic and computer field must be carefully prepared so that it describes the system or software at a scope appropriate for the invention. In addition, as with any patent specification, the detailed description of the invention must satisfy the three statutory requirements set forth in 35 U.S.C. §112, first paragraph, namely, the enablement requirement, the best mode requirement, and the written description requirement. In addition, Section 112, second paragraph, imposes a requirement of "particularity" that is important for computer-related inventions.

Enablement Requirement

Arguably the most important requirement under 35 U.S.C. §112, first paragraph, is enablement. To meet this requirement, the inventor must disclose the invention in sufficient detail to allow one of ordinary skill in the art to practice the invention without undue experimentation.[iii]

It is important to remember that the enablement requirement extends only to the invention *as claimed*. Thus, to meet the enablement requirement, aspects of the system that are not needed to practice the claimed invention need not be disclosed in as much detail as aspects needed by the invention. When dealing with software applications, for example, the invention may be in a relatively small part of the total program. Other parts of the program (e.g., those that establish initial conditions or interface with the operating system or other programs) may not need to be described in as much detail as the portion of the program that performs the inventive data processing. In addition, the invention

does not need to be fully and completely described as long as it can be discerned by a skilled person, because the statute allows for some experimentation, drawing the line at *undue* experimentation. As described below, however, for reasons related to the Written Description requirement and patent eligible subject matter, it may be necessary to describe the invention in greater detail than required by the Enablement requirement.

In order to meet the enablement requirement it is helpful to know which parts of the system would be readily understood by a skilled person and which would not. In addition, it is important to know the essential hardware elements as well as program modules and data structures needed to support the invention as it is claimed in both the independent and dependent claims.

The level of detail that satisfies the enablement requirement is determined by the level of skill attributed to a fictional "person of ordinary skill in the art."[iv] If a skilled person understands a building block of a system, be it a first-in-first-out (FIFO) memory or an operating system, then the building block does not need to be described. Thus, one goal of understanding the level of ordinary skill is to limit what is described in the specification and, thus, reduce the cost of the application. The challenge then is to determine this level of ordinary skill in the art for a particular invention. Because electronics and computers are in the "predictable arts," the ordinarily skilled person is assumed to be highly skilled and, thus, can understand the invention from a relatively high-level description in the specification.[v] Furthermore, as stated by the Supreme Court in *KSR Int'l Co v. Teleflex Inc*. A person of ordinary skill is also a person of ordinary creativity, not an automaton.[vi]

Next, it must be ascertained what level of experimentation is permitted. The Federal Circuit, in *In re Wands*,[vii] identified eight factors that need to be considered to determine whether a disclosure requires undue experimentation:

(1) the quantity of experimentation necessary,

(2) the amount of direction or guidance presented,

(3) the presence or absence of working examples,

(4) the nature of the invention,

(5) the state of the prior art,

(6) the relative skill of those in the art,

(7) the predictability or unpredictability of the art, and

(8) the breadth of the claims.[viii]

Thus, the determination of whether a particular disclosure requires undue experimentation cannot be made based simply on the amount of time required to obtain a working system from what is disclosed in the patent.[ix] This is especially true of complex computer systems, that may require several person-years of noninventive work by journeyman programmers to develop a working system from a functional specification. In *Falkner v. Inglis*[x] the Federal Circuit agreed with the Board of Patent Appeals and Interferences (BPAI) who observed that the amount of experimentation which is undue

varies with the field of endeavor. In a field where complex experimentation is the norm, "difficult and time consuming" experimentation may not be deemed undue.[xi]

If, however, "an inventor attempts but fails to enable his invention in a commercial product that purports to be an embodiment of the invention, that is strong evidence that the specification lacks enablement."[xii] Thus, an inventor's inability to make an embodiment of the invention may be evidence that the specification is not sufficient because undue experimentation is needed.

Fonar Corp. v. General Electric Co.[xiii] illustrates the effect of the presumed high level of skill in the electronic and software arts. In this case, the court in recognized that flowchart diagrams are not needed for a programmer to be able to practice an invention if the functions of the software are adequately disclosed in the text. "This is because, normally, writing code for such software is within the skill of the art, not requiring undue experimentation . . . . Thus flowcharts or source code listings are not a requirement for adequately disclosing the functions of the software."[xiv]

The Federal Circuit provided counterbalancing analysis of the enablement requirement, at least as it pertains to software inventions, in *Crown Operations Int'l Ltd. v. Solutia Inc.*[xv] The court stated that the novel aspects of an invention need to be supported in the specification and cannot be left to the "inference of a person of ordinary skill in the pertinent art to supply such novel aspects."[xvi] Furthermore, the court noted that computer software has special requirements: where a specification claims an invention involving computer software, details of the software must be disclosed. If they are not, a court may find that the experimentation needed to write the software may be undue.[xvii] This statement tempers the holding of *Fonar* cautioning the applicant to be careful when describing inventions that claim software. Although flowcharts may not be necessary, an adequate description of the functions performed by the software is still required.

Enabling disclosure may be found in any part of the application, the detailed description, claims, drawing figures, even the background. In *Callicrate v Wadsworth Manuf. Inc.*[xviii] the court stated that a "a patent specification may sufficiently enable a feature under §112, ¶1 even if only the background section provides the enabling disclosure."[xix] The court assumed that if this description would not be appropriate to meet the enablement requirement, the examiner would not accept it and reject the claim as not being enabled. This is the case even if the feature is disparaged in the background section, "this court has stated that disparaging remarks in a background section or remarks characterizing the prior art as less effective do not remove those disclosures as enabling references."[xx]

A question sometimes arises as to the desirability of including detailed schematic diagrams or source-code listings, possibly as an appendix to the application, to ensure that the enablement requirement is met. On the positive side, this type of disclosure should be found to be enabling even for a person at a relatively low skill level. In addition, the appendix may allow the claimed invention to be expanded to include features of the circuit or program that were not originally described in the text of the detailed description. As described below, however, if the feature is disclosed only in the software appendix, it may be enabled but not satisfy the written description requirement

and, so, may not be able to be claimed. Furthermore, a software appendix may go a long way toward satisfying the best mode requirement. Note that the PTO requires lengthy programs to be submitted on CD-ROM.[xxi]

The disclosure of a schematic or source code, however, may give away more than is needed to protect the invention effectively. It is one thing to give competitors a functional specification; it is quite another to give them a working prototype.

Object-code appendixes, for computer-implemented inventions, are accepted by the PTO.[xxii] They are, however, of doubtful utility because they cannot be easily understood by one skilled in the art and thus cannot be relied on as teaching anything about the invention. These appendixes, however, may be useful where precise timing is an important aspect of the invention, as for real-time systems. The object-code appendix plus a disclosure of the exemplary hardware elements may allow for the reconstruction of the invention so that these aspects of the invention may be observed.

One alternative for computer-implemented inventions is to provide a pseudocode appendix. For a well-commented program, this type of appendix can be generated quite easily by deleting most of the code except for the process or method headers (which define the data structures and how they are shared), procedure calls (which define the program flow), and any comments that may explain the functions performed by each of the processes or methods that make up the program.

It should be noted that many foreign patent offices do not accept appendixes and do not allow the use of computer code—even source code—to teach the invention.[xxiii] Consequently, if the U.S. patent application needs to rely on the software appendix for enabling disclosure, it is likely that a similar requirement will not be met in the corresponding foreign applications.

The PTO, in the Manual of Patent Examining Procedure (MPEP), places additional requirements on the disclosure needed for claims related to computer programs.[xxiv] Regarding the software component of a computer implemented invention, the MPEP states "[w]hile no specific universally applicable rule exists for recognizing an insufficiently disclosed application involving computer programs, an examining guideline to generally follow is to challenge the sufficiency of such disclosures which fail to include either the computer program itself or a reasonably detailed flowchart which delineates the sequence of operations the program must perform."[xxv] With regard to the hardware component of these inventions, more may be required than merely showing a block diagram having interconnected blocks. The MPEP places a burden on the Examiner: "the examiner should determine whether certain of the hardware or software components depicted as block elements are themselves complex assemblages which have widely differing characteristics and which must be precisely coordinated with other complex assemblages."[xxvi] Also, it may not be enough to cite commercially available components or components described in other patents in order to satisfy the enablement requirement for an invention using those components, according to the MPEP:

> Merely citing prior art patents to demonstrate that the challenged components are old may not be sufficient proof since, even if each of the enumerated devices or labeled blocks in a block diagram disclosure were old *per se,* this would not make it self-evident how each would be

> interconnected to function in a disclosed complex combination manner. Therefore, the specification in effect must set forth the integration of the prior art; otherwise it is likely that undue experimentation, or more than routine experimentation would be required to implement the claimed invention.[xxvii]

As technology has advanced, the line between hardware and software has become increasingly blurred. This complicates the task of meeting both the enablement and best mode requirements. Because different standards apply for hardware and software, it may be difficult to determine how to disclose a hardware element that is generated entirely using software. One example of this blurring is in the design of Application Specific Integrated Circuits (ASICs). Almost all ASIC manufacturers presently provide systems by which a circuit may be described functionally using a block-structured programming language or a state diagram. This software description may be used to simulate the circuit and adjust its operating parameters. When the user is satisfied with the results of the simulation, a design for an equivalent circuit may be generated automatically from the functional description. In this instance, the inventor may know what the invention does but may not know details of how it operates. One method of disclosing this type of invention is to describe the program used for the simulation (for example, by way of flowchart diagrams) and then identify the hardware as a finite state machine that performs the operations illustrated by the flowcharts or state diagrams. Of course, the particular software system used to define and fabricate the ASIC should be identified in the detailed description.

Inventions near the borderline of *statutory subject matter* may be invalidated for lack of enablement on different grounds. In *In re Fisher*[xxviii] the court stated that "the enablement requirement of §112 incorporates the utility requirement of § 101."[xxix] Quoting *In re Ziegler*[xxx] the court stated:

> [t]he how to use prong of *section 112* incorporates as a matter of law the requirement of 35 U.S.C. § 101 that the specification disclose as a matter of fact a practical utility for the invention. If the application fails as a matter of fact to satisfy 35 U.S.C. § 101, then the application also fails as a matter of law to enable one of ordinary skill in the art to use the invention under 35 U.S.C. § 112.[xxxi]

This statement focuses on the word "using" in the § 112 requirement that the inventor disclose "the manner and process of making and using [the invention], in such full, clear concise, and exact terms as to enable any person skilled in the art to which it pertains … to make and use the same." By focusing on the *using* part of the enablement requirement, this decision confuses § 112 enablement with § 101 utility. While there may be aspects of the two tests that are similar, it is not helpful to equate a lack of enablement with the failure of the specification to recite a substantial, specific and credible utility for an invention, especially if the invention is found not to meet the requirements of § 101 because it recites non-statutory subject matter.

The boundary between the enablement and best mode requirements is also in flux. The Federal Circuit, in *Leibel-Flarsheim Co. v. Medrad, Inc.,*[xxxii] reiterated that an invention must be enabled over the entire scope of the claim that defines the invention.

In this decision, the Federal Circuit echoed its holding in *LizardTech, Inc. v. Earth Resource Mapping, Inc.*[xxxiii] (described below). *Leibel-Flarsheim* concerned a syringe having a high-pressure syringe body. Leibel amended the claims to remove the limitation of a pressure jacket so that the claim would read on Medrad's product which did not include the pressure jacket. Leibel, however, did not remove the claim limitation requiring a "syringe body … structurally capable of withstanding … an operating pressure of at least 100 psi…."[xxxiv] The record also included testimony of the inventors who stated they had not been able to make a high-pressure syringe without a pressure jacket.[xxxv] Furthermore, the Federal Circuit accepted the finding of the district court that "the state of the art was such that a jacketless system with a disposable syringe would have been a 'true innovation'" and that "no genuine issue of material fact exists as to whether undue experimentation would have been required to make and use the injector without a pressure jacket."[xxxvi] Thus, the court found that, while the embodiment of the invention including the pressure jacket was enabled, the embodiment without the pressure jacket was not. Because Liebel had amended the claim with the express intention of removing the pressure jacket, the court could not read that limitation into the claim.[xxxvii] Consequently, the court affirmed the holding of the district court that the claim was invalid as not being enabled over its entire scope.[xxxviii]

The court cited *Leibel Flarsheim* favorably in its decision in *Automotive Technologies, Int'l v. BMW*.[xxxix] This case concerned automobile side-impact sensors for activating air bags. The specification provided a detailed description of the construction of a mechanical side-impact sensor but provided only a summary description of an electronic sensor. Moreover, the specification admitted that side impact sensing is a new field.[xl] Because it was a new field, the court held that ATI could not rely on the knowledge of one of ordinary skill in the art to provide the missing details. Citing *Genentech v. Novo Nordisk A/S*, the court stated, "'it is the specification, not the knowledge of one skilled in the art, that must supply the novel aspects of an invention in order to constitute adequate enablement.'"[xli] Because electronic side-impact sensors had not been enabled and because ATI asserted that its claims covered both mechanical and electrical side impact sensors, the court held ATI's patent to be invalid because it was not enabled over its full scope.[xlii] *Automotive Technologies*, was, in turn, cited favorably in *Sitrick v. Dreamworks, LLC*.[xliii] This case involved software for substituting a user's image and/or voice for existing images and voices in a video game or movies. The court found that, while the application may enable this substitution for video games, it did not enable the substitution for movies.[xliv] Because the asserted claims were not enabled over their full scope, the court found them to be invalid.[xlv]

Best Mode Requirement

The best mode requirement is met by disclosing the last, best way of making or using the invention that is known to the inventor prior to filing the application.[xlvi] This requirement ensures that the public has access to the invention in its best form. The inquiry focuses on the inventor's state of mind *when the application was filed*. It questions whether the inventor knew of a best mode at that time and whether it was adequately disclosed.[xlvii] When the inventor is relying on the disclosure of a parent application under 35 U.S.C. § 120, the parent application must also disclose the best

mode for practicing the invention.[xlviii] Furthermore, where the key feature is a particular size or dimension, patent drawings alone can not be relied upon to provide support. There must be some discussion of the size or dimension in the patent specification.[xlix]

Although intentional concealment is sufficient to violate the best mode requirement, the requirement may also be violated by an accidental concealment.[l] An accidental concealment may occur, for example, where an inventor intends to disclose a key element of the invention but does not do so in sufficient detail to allow a skilled person to practice the invention.[li]

No particular form of disclosure is required to meet the best mode requirement.[lii] Thus, there is no need to provide a working example (e.g., a source-code appendix) or a description of a commercially viable product. If certain data sets, programs, or hardware elements are needed to make the product commercially viable, and these requirements were known to the inventor when the application was filed, they cannot be omitted. These requirements, however, do not need to be described in detail.

To ensure that the best mode requirement is met, the practitioner should determine how the inventors intend to make and use the invention. In addition, before preparing the final draft of the application, the attorney or agent should confirm with the inventors that the best way of making or using the invention is disclosed in the application. Where the invention is described in terms of multiple exemplary embodiments, there is no need to identify any one alternative as the preferred or best alternative. While 35 U.S.C. §112 requires that the best mode be disclosed, there is no requirement that it be specifically identified.[liii]

For computer-related inventions, a software appendix may be used to ensure that the best mode requirement is satisfied. If the client consents to including a source-code appendix, the attorney or agent preparing the application may obtain a copy of the program on CD-ROM immediately before filing the application and attach it to the specification as an appendix. If the client is reluctant to include a source-code appendix, an equivalent disclosure may be made using a pseudocode appendix or a functional specification for the program.

It is important to remember that the best mode requirement applies only to the operation of the invention *as claimed.* "*Dana* and *Datapoint* are consistent with other decisions of this court in which we have held that unclaimed matter that is unrelated to the operation of the claimed invention does not trigger the best mode requirement."[liv] Note, however, that subject matter which is needed to implement or use the invention in the best way known to the inventor at the time of filing is subject to the best mode requirement whether or not it is claimed.[lv]

In *Teleflex Inc. v. Ficosa North America Corp.*,[lvi] the Federal Circuit provided detailed guidelines for determining whether an inventor has satisfied the best mode requirement. Germane to the case-at-hand, the court reiterated that the best mode requirement "does not extend to 'production details,' including commercial considerations such as equipment on hand, availability of materials, relationships with suppliers or customer requirements," and that "[r]outine details need not be disclosed because one skilled in the art is aware of alternative means for accomplishing the routine details that would still produce the best mode of the claimed invention."[lvii]

The best mode requirement is rarely encountered during prosecution because the examiner does not know how invention is being used and has no easy way of discerning it. The examiner may reject claims for failure to disclose the best mode when "the quality of applicant's disclosure is so poor as to effectively result in concealment," or when "a feature considered critical or essential by applicant to the practice of the claimed invention is missing from the claim," and is not enabled by the specification."[lviii]

Written Description Requirement

The written description requirement has received considerable attention in since the decision in *Markman v. Westview Instruments,*[lix] because of the requirement for Markman hearings to determine claim scope during patent litigation. In *Vas-Cath Inc. v. Mahurkar*,[lx] the Federal Circuit stated that "35 U.S.C. 112 requires a 'written description of the invention' which is separate and distinct from the enablement requirement. The purpose of the 'written description' is broader than to merely explain how to 'make and use;' the applicant must also convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession *of the invention.* The invention is, for purposes of the 'written description' inquiry *whatever is now claimed.*" (emphasis in original). Traditionally, the court has used the written description requirement to determine *priority* of an invention. Subject matter that was first claimed during the prosecution of an application did not meet the written description requirement if it was not described in the original specification such that a skilled person would understand that the applicant had invented it. The purpose of the written description requirement has been in flux recently.

After *Markman*, it often has been used by the district courts and the Federal Circuit to determine the meaning of claim terms, whether the claims containing these terms were in the original written description or added later. In these cases, it appears that the Federal Circuit did not believe it sufficient for the inventor merely to describe a claimed invention; the description must clearly show that the inventor believed the claimed subject matter to be *the invention*. Thus, the inventor was required not only to enable a claimed invention but also to affirmatively indicate in the patent specification that it *was* the invention. This added function for the written description requirement, and the uncertainty of the district courts as to how to use the written description during claim interpretation, has produced a number of panel decisions from the Federal Circuit with often conflicting methodologies for interpreting claims and has given rise to a doctrine of *prosecution disclaimer* (sometimes called *specification disclaimer*), by which the scope of a claim may be limited based on statements made in the specification and prosecution history.

In addition to the burden the courts have put on the written description requirement, the PTO appears to have confused it with the enablement requirement. "The written description requirement has several policy objectives. [T]he 'essential goal' of the description of the invention requirement is to clearly convey the information that an applicant has invented the subject matter which is claimed.' Another objective is to put the public in possession of what the applicant claims as the invention."[lxi]

Recently, some judges on the court have advocated reducing the importance of the written description requirement in claim interpretation or even eliminate it as a separate doctrine. In his concurring opinion in *Ariad Pharm. Inc. v. Eli Lilly and Co.*[lxii] Judge Linn advocated eliminating the written description requirement both for priority and claim construction purposes. "I write separately to emphasize, as I have before, my belief that our engrafting of a separate written description requirement onto section 112, paragraph 1 is misguided…. [S]ection 112, paragraph 1 requires no more of the specification than a disclosure that is sufficient to enable a person having ordinary skill in the art to make and use the invention…" (cites omitted).[lxiii]

The Federal Circuit, in *LizardTech, Inc. v. Earth Resource Mapping, Inc.*[lxiv] attempted to clarify at least a part of the relationship between the written description requirement and the enablement requirement . Addressing the claim scope supported by a written description having a single embodiment, the court stated that a generic claim would be supported only to the extent that the disclosed embodiment "would 'enable one of ordinary skill in the art to practice the *full scope* of the claimed invention.'"[lxv]

The standard used to determine whether the written description requirement has been met is stated in *Vas-Cath*:[lxvi]

> Although [the applicant] does not have to describe exactly the subject matter claimed, . . . the description must clearly allow persons of ordinary skill in the art to recognize that [he or she] invented what is claimed . . . . [T]he test for sufficiency of support in a parent application is whether the disclosure of the application relied upon "reasonably conveys to the artisan that the inventor had possession at the time of the later claimed subject matter."[lxvii]

Issues relating to the written description requirement most often arise as a result of changes to the claims during prosecution. Where, for example, a claims element is made broader in an amendment, the specification must contain material that supports the broader claim. The written description requirement, however, may also be relevant when a claim is made more narrow, for example, by adding an element that did not previously exist. To satisfy the written description requirement, this new element must be described in the specification at least to the extent that it is included in the claim. That is to say, it must be described in a manner so that one of ordinary skill would recognize it as a part of the invention.

Written description issues may also arise with original claims. "The claimed invention as a whole may not be adequately described if the claims require an essential or critical feature which is not adequately described in the specification and which is not conventional in the art or known to one of ordinary skill in the art."[lxviii] There is some overlap between this aspect of the written description requirement and the best mode requirement, described above. By not describing an essential or critical feature, the patentee necessarily is concealing the best way known to the inventor of making or using the invention.

Even though this is the *written* description requirement, it has been held that the requirement may be satisfied by material disclosed in the drawing figures.[lxix] Another possible source of material to satisfy the written description requirement is the software appendix, if one exists. If a component of the invention is disclosed only in the appendix,

however, it raises the question as to whether the inventor considered that component to be part of the invention. If it is part of the invention, why was it described only in the appendix and not in the main body of the application? The key is to have sufficient basis in the patent specification to identify all possible inventions and to prove that the inventor was in possession of these inventions at the time the application was filed.

Revolution Eyeware Inc. v. Aspex Eyewear, Inc.[lxx] addressed the relationship between a written description analysis and a claim construction analysis.

> Certainly, a claim construction and a written description analysis are two separate processes. However, they serve related functions in determining whether a claim is commensurate with the scope of the specification - a court looks to the specification for guidance to ascertain the scope of the claim in claim construction; it also looks to the specification to decide whether the disclosure provides adequate support for the claims in written description analysis.[lxxi]

The court also provided clarification on how the written description is to be applied when interpreting a claim in *ICU Medical, Inc. v. Alaris Medical Systems, Inc.*[lxxii]

> "the line between construing terms and importing limitations can be discerned with reasonable certainty and predictability if the court's focus remains on understanding how a person of ordinary skill in the art would understand the claim terms" Indeed, the court should focus on how such a person would understand the claim term "after reading the entire patent."lxxiii

Particularity Requirement

The particularity requirement is related to the written description requirement. Section 112 requires that the invention be particularly disclosed and distinctly claimed. The PTO interprets *In re Donaldson* [lxxiv] as requiring Examiners to interpret apparatus claim elements containing functional language with reference to the specification. Thus, any claim element that is cast only in functional terms may be rejected under Section 112, second paragraph, if the underlying structure or acts are not described in sufficient detail in the specification. If a claim does not use specific language, however, it is not presumed to be covered by Section 112, sixth paragraph. For a claim element to be presumed a means-plus-function element, it must include the words "means for," include functional language, and not recite specific structure performing the function. Similarly, for an element to be presumed a step-plus-function element, it must include the words "step for," have functional language, and not recite specific acts.[lxxv] If claims of this type are used, they must be specifically supported in the specification. In particular, means-plus-function claim elements must be supported by a description of a specific apparatus that performs the recited function. Similarly, the specification must support step-plus-function claims by linking specific acts to the recited function. Failure to specifically link the function to the apparatus or acts may result in these claims being invalid under 35 U.S.C. § 112, second paragraph.[lxxvi] One particular area of concern for claims covered by Section 112, sixth paragraph is the description of equivalents in the specification. If too broad a range of equivalents is described in the specification, the claim may be rejected as not distinctly claiming the invention.

Means-plus-function elements in claims must have some identifiable structure in the specification, even if a person of ordinary skill in the art would understand the structure corresponding to the function. In *Biomedino, LLC v. Waters Tech. Corp.*[lxxvii] the claim recited "control means for automatically operating valves" and the specification recited only that the invention, "may be controlled automatically by known differential pressure, valving and control equipment."[lxxviii] The court found this statement to be insufficient to support the means-plus-function language, even though the appellant's expert testified that one of ordinary skill in the art would know and understand what structure corresponds to the means limitation. The court noted that 35 U.S.C. § 112, paragraph 6 requires some disclosure of structure in the specification corresponding to the claimed means.[lxxix] "[A] bare statement that known techniques or methods can be used does not disclose structure."[lxxx]

Although some disclosed structure is required, it does not need to be described in detail. In a non-precedential opinion, *Aristocrat Tech. Australia Pty Ltd, v Multimedia Games, Inc.* the court noted, "[t]he law does nor require that structure be explicitly identified as long as a person of ordinary skill in the art would understand what structure is identified in the specification."[lxxxi] Programmed microprocessors or computer present a special problem under 35 U.S.C. § 112, paragraph 6. In *Aristocrat*, the court quoted *WMS Gaming, Inc. v. International Game Technology*[lxxxii] for the rule that "when a general purpose microprocessor or computer is the structure corresponding to a recited function, a specific algorithm for performing that function must be disclosed in order to avoid indefiniteness."[lxxxiii] The court, however, tempered this rule, at least for software, "WMS Gaming, however, does not require that a particular algorithm be identified if the selection of the algorithm or group of algorithms needed to perform the function in question would be readily apparent to a person of skill in the art.[lxxxiv] Consequently, the disclosure of a microprocessor or general purpose computer can satisfy 35 U.S.C. § 112, paragraph 6 if the algorithm corresponding to the particular structure would be readily apparent to the skilled person.

The Federal Circuit has used a statement from the Supreme Court's *KSR* decision to allow applicants some leeway in describing the corresponding structure. In *Allvoice Computing PLC v. Nuance Communications, Inc.*[lxxxv] the court noted,

> With that understanding of the proper parameters of the claim, the record shows that an artisan of ordinary skill would understand the bounds of the claim when read in light of the specification. ("A person of ordinary skill is also a person of ordinary creativity, not an automaton."). Thus, the record shows that claim 60 satisfies the definiteness requirement[lxxxvi]

Where the specification admits that the structure corresponding to a means-plus-function claim term is "a new field," however, the knowledge of a person of ordinary skill in the art may not be able to be used to fill in missing disclosure for a means-plus-function claim element. In *Automotive Technologies,* the court found that, although the specification did disclose an electronic side impact sensor corresponding to the claim element and, thus, met the particularity requirement, the specification did not enable the electronic sensor, even though it did enable mechanical sensors. "Given that side impact sensing was a new field and that there were no electronic sensors in existence that would detect side impact crashes, it was especially important for the specification to discuss

how an electronic sensor would operate to detect side impacts and to provide details of its construction."[lxxxvii] Thus, because the field of technology was new, the court assumed less knowledge by the skilled person and required more disclosure in the patent specification.

It is not sufficient under 35 U.S.C. § 112, sixth paragraph to disclose a general purpose computer as the corresponding structure for a means-plus-function claim element, without disclosing specific software running on the computer corresponding to the functional limitation.[lxxxviii]

In *Energizer Holdings, Inc. v. ITC*[lxxxix] the Federal Circuit reiterated that a claim is not indefinite merely because it is hard to construe.[xc] In this case, even though the disputed term lacked antecedent basis in the claim, the court found that a person of ordinarily skill in battery design would understand the meaning of the term "zinc anode."[xci] In making this finding, the court noted that, as with enablement and written description, "[c]laim definiteness is analyzed 'not in a vacuum, but always in light of the teachings of the prior art and of the particular application disclosure as it would be interpreted by one possessing the ordinary level of skill in the pertinent art.'"[xcii]

In the USPTO, however, indefiniteness is not subject to these guidelines. The Board of Patent Appeals and Interferences (BPAI) clarified how examiners must determine whether a claim including functional limitations is indefinite in *Ex parte Miyazaki*[xciii] The invention in this application concerned a paper feeding unit for a printer, the location of which was defined in functional terms. The Board found the term "sheet feeding area" had two different meanings in the specification and, thus, found the claim invalid under 35 U.S.C. § 112, second paragraph.

> In particular, rather than requiring that the claims are insolubly ambiguous, we hold that if a claim is amenable to two or more plausible claim constructions, the USPTO is justified in requiring the applicant to more precisely define the metes and bounds of the claimed invention by holding the claim unpatentable under 35 U.S.C. § 112, second paragraph as indefinite.

The Board justified this difference in interpretation for the USPTO because there is no presumption of validity. Furthermore, the applicant can always amend the claim to correct the perceived deficiency.

Another form of indefiniteness, linked - at least loosely - to the enablement cases such as *Lizardtech*, *Liebel-Flarsheim*, *Automotive Technologies* and Sitrick, was recognized by the court in *Allvoice* In this decision, the court described the definiteness requirement of 35 U.S.C. § 112, paragraph 2 as asking "whether one skilled in the art would understand the bounds of the claim when read in light of the specification."[xciv] The invention in this case related to voice recognition software and, in particular to a feature of the software that keeps track of word position changes to identify audio corresponding to a selected text. Thus, the claim element, which was in means-plus-function form involved software running on a general purpose computer. In finding the claim to satisfy the definiteness requirement, the court stated, "[i]n software cases, therefore algorithms in the specification need only disclose adequate defining structure to render the bounds of the claim understandable to one of ordinary skill in the art."[xcv]

This issue was also addressed in *Halliburton Energy Scvs. v. M-I LLC.*[xcvi] This case concerned the definition of the claim term "fragile gel." The court indicated that the standard for finding a claim indefinite is met "where an accused infringer shows by clear and convincing evidence that a skilled artisan could not discern the boundaries of the claim based on the claim language, the specification, and the prosecution history, as well as her knowledge of the relevant art area."[xcvii] Here, the claim term was defined in the specification, but the court found that definition to be unclear. Thus, it is not sufficient to merely define a term, the definition must be sufficient to allow a skilled person to "translate the definition into meaningfully precise claim scope."[xcviii]

Inherency

One question that the court has addressed, under the priority determination aspect of the written description requirement, is the role of inherency. If the purpose of the written description requirement is to give the skilled person notice that a later-claimed invention was indeed in the possession of the inventor, to what extent may the inventor rely on aspects of the invention that were not explicitly described but were inherent in the original description? The Federal Circuit previously addressed this topic in *Purdue-Pharma L.P. v. Faulding Inc.*[xcix] when it noted that, although the specific formulations were enabled by the broad disclosure, they were not discussed "even in passing."[c] Thus, even though the disclosure of the two compounds may have been inherent in the original disclosure, the inventors violated the written description requirement because they had not acknowledged the specific compounds in their original specification. A similar result was reached in *TurboCare Division v. General Electric Co.*[ci] In this case, the Federal Circuit stated that it was not enough that the missing material be obvious in view of what was disclosed. Instead, the invention must be disclosed "in sufficient detail that one skilled in the art can clearly conclude that the inventor invented the claimed invention as of the filing date sought."[cii]

As can be seen from the above, the courts and the PTO have interpreted the "requirement" of the written description requirement in many ways. In *Moba B.V. v. Diamond Automation Inc.*,[ciii] the Federal Circuit interpreted the written description according to its traditional purpose: determining invention priority. Indeed, in a concurring opinion, Judge Rader advocated eliminating the written description requirement, subsuming its function under the prohibition against introducing new matter contained in 35 U.S.C. §132.[civ]

While the Federal Circuit has expanded the role of the written description requirement, it still cites cases for the proposition that the claims do not need to include every component described in the specification.[cv] Its reliance on these cases, however, is often sidetracked by the line of cases it developed concerning claim construction. While the canons of construction existed well before *Markman*, the requirement for *Markman* hearings has increased the use of these canons and caused them to become confused with the written description requirement. The claim interpretation methods developed by the district courts and sanctioned by the Federal Circuit in response to *Markman* initially focused more attention on the patent specification and—either inadvertently or by design—tended to confine the claims to cover only inventions that had literal support in the specification.

Markman outlined the steps to be used in construing the claims of a patent:

> Claims must be read in view of the specification, of which they are a part . . . . For claim construction purposes, the description may act as a sort of dictionary, which explains the invention and may define terms used in the claims . . . . As we have often stated, a patentee is free to be his own lexicographer . . . . The caveat is that any special definition given to a word must be clearly defined in the specification . . . . To construe claim language, the court should also consider the patent's prosecution history, if it is in evidence . . . . The court may, in its discretion, receive extrinsic evidence in order "to aid the court in coming to a correct conclusion" as to the "true meaning of the language employed" in the patent.[cvi]

The *Markman* court, however, was careful to limit the role of the patent description in defining the invention. "The written description part of the specification itself does not delimit the right to exclude. That is the function and purpose of the claims . . . . Although the prosecution history can and should be used to understand the language used in the claims, it too cannot 'enlarge, diminish or vary' the limitations in the claims."[cvii] This caution against overuse of the written description has received less attention as this line of cases developed.

Markman, although the Supreme Court had not yet affirmed it, was relied upon in *Hoechst Celanese Corp. v. BP Chemicals, Ltd.*[cviii] This decision focused on the definition of the word "stable" as it was used in the claims. In arriving at its holding, the Federal Circuit considered: 1) an explicit definition of the term in the patent specification;[cix] 2) testimony of technical experts;[cx] 3) dictionary definitions;[cxi] and 4) testimony of the inventor.[cxii] In the end, however, the court based its holding on the observation that, if BP's interpretation of the claim were adopted, the inventor's preferred embodiment would not be covered by the claim.[cxiii] Accordingly, the court affirmed the finding of infringement made by the district court and adopted the interpretation advanced by Celanese. This early case in the line of post-*Markman* cases interpreting the written description requirement employed a wide-ranging analysis of the disputed claim term.

In *Vitronics Corp. v. Conceptronic Inc.*,[cxiv] the court used the same rationale to arrive at the meaning of the term "solder reflow temperature," namely that an interpretation that excluded the preferred embodiment could not be correct.[cxv] In arriving at this result, the court outlined the steps to be followed in interpreting a claim. The court cited *Markman* for the proposition that intrinsic evidence—the patent specification and claims and the prosecution history—should be considered first. To define how this evidence is to be considered, the court laid out the following canons of construction: "First, we look at the words of the claims themselves, both asserted and nonasserted to define the scope of the patented invention. . . . Although words in a claim are generally given their ordinary and customary meaning, a patentee may choose to be his own lexicographer and use terms in a manner other than their ordinary meaning."[cxvi] "Thus, second, it is always necessary to review the specification to determine whether the invention has used any terms in a manner inconsistent with their ordinary meaning."[cxvii] "Third, the court may also consider the prosecution history of the patent, if in evidence."[cxviii] "Only if there were still some genuine ambiguity in the claims, after

consideration of all available intrinsic evidence, should the trial court have resorted to extrinsic evidence, such as expert testimony."[cxix]

The Federal Circuit found that the district court had improperly relied on expert testimony to determine the meaning of the term "solder reflow temperature." "Because the specification clearly and unambiguously defined the disputed term in the claim, reliance on this extrinsic evidence was unnecessary, and hence, legally incorrect."[cxx] The court distinguished between extrinsic evidence needed to understand the technology and extrinsic evidence "on the *proper construction* of a disputed claim term."[cxxi] The former is permissible while the latter is to be avoided. "Even in those rare instances, prior art documents and dictionaries . . . are more objective and reliable guides. Unlike expert testimony, these sources are accessible to the public in advance of litigation."[cxxii] This statement also indicates that, at this point in the development of the case law, the court preferred not to use any extrinsic evidence, even dictionaries.

In *Vitronics*, the court discarded a claim interpretation because it did not cover the preferred embodiments of the invention as described in the specification. This, however, should not be seen as a safe harbor for the careless draftsman. In *Chef America Inc. v. Lamb-Weston Inc.,*[cxxiii] for example, the claim stated that dough was heated to 400 degrees, when applicant intended to state that the dough was placed in an oven that was heated to 400 degrees. Nonetheless, the court held the patentee to the plain meaning of the claim. Furthermore, in *Phillips*, the court stated, "[w]hile we have acknowledged the maxim that claims should be construed to preserve their validity, we have not applied that principle broadly, and we have certainly not endorsed a regime in which validity analysis is a regular component of claim construction. Instead, we have limited the maxim to cases in which 'the court concludes, after applying all the available tools of claim construction, the claim is still ambiguous.'"[cxxiv] Thus, if a claim term is clearly erroneous, it can not be corrected. It is only where the claim term is ambiguous that the court will look to the specification to see if it can be interpreted in a manner that renders the claim valid.

An erroneously used claim term was reinterpreted by the court to cover the applicant's preferred embodiment in *Honeywell Int'l Inc. v Universal Avionics*.[cxxv] Even though the claim term was not used in the specification, the court interpreted its use in the claim and the described exemplary embodiment as an implicit redefinition of the claim term.[cxxvi] The dissent, however, argued that because the claim term was not used in the specification, it should not be interpreted as an implicit redefinition but an error in the claim. "it is not the province of the courts to salvage poorly--or incorrectly--drafted patent claims."[cxxvii]

In *Seachange International, Inc. v. C-Cor Inc*.[cxxviii], the court provided guidance on the role of claim differentiation in the interpretation of claim terms. "Although the doctrine is at its strongest 'where the limitation sought to be 'read into' an independent claim already appears in a dependent claim,' there is still a presumption that two independent claims have different scope when different words or phrases are used in those claims. However, the doctrine 'only creates a presumption that each claim in a patent has a different scope; …. The doctrine of claim differentiation can not broaden claims beyond their correct scope, determined in the light of the specification and the prosecution history and any relevant extrinsic evidence."[cxxix] In *Curtiss-Wright Flow*

Control Corp. v. Velan, Inc.[cxxx], the court provided a lengthy description of the law regarding claim differentiation. As in *Seachange*, the court stated that claim differentiation is most applicable between independent claims and their dependent claims.[cxxxi] The court also observed, however, that application of claim differentiation to two independent claims is governed by two considerations: "(1) claim differentiation takes on relevance in the context of a claim construction that would render additional or different language in another independent claim superfluous; and (2) claim differentiation 'can not broaden claims beyond their correct scope.'"[cxxxii] Thus, for claim differentiation to apply, there must be some basis in the specification for the different claim scopes.

The canons of construction were further developed to include not only the specification but the prosecution history in *Gentry Gallery Inc. v. Berkline Corp.*[cxxxiii] This case involved the definition of the word "console" and the positioning of controls for a pair of reclining chairs. In determining the definition of the word "console" for literal infringement, the court looked to the prosecution history of the patent. The court found that a statement made in a Petition to Make Special (PTMS) which distinguished the invention from a prior art reference limited the literal scope of the claim so that it could not cover a similar structure: "[i]n the PTMS, that feature was distinguished from the claimed 'console.' Thus, we conclude that Berkline's sofas do not include the claimed 'console.' "[cxxxiv]

Even during the period in which the written description requirement was being expanded, the Federal Circuit did not limit every claim that it interpreted. In *Johnson Worldwide Associates, Inc. v. Zebco Corp.*,[cxxxv] the court interpreted a claim to cover an embodiment that was not explicitly described. In this case, two terms were crucial to the interpretation of the claim: "heading" and "coupled." The invention concerned a trolling motor with a heading lock that pulled a boat in a direction indicated by the heading lock. Zebco asserted that the use of the word "heading" was limited to the direction of the motor and, thus, required that the heading lock be physically coupled to the motor. Zebco also asserted that this construction was required by the use of the word "coupled" in the claim.

In analyzing the use of these terms in the specification, the court defined the following canons of construction:

> [A] court must presume that the terms in a claim mean what they say, and, unless otherwise compelled, give full effect to the ordinary and accustomed meaning of claim terms . . . claim terms cannot be narrowed by reference to the written description or prosecution history unless the language of the claims invites reference to those sources . . . [o]ur case law demonstrates two situations where a sufficient reason exists to require the entry of a definition of a claim term other than its ordinary and accustomed meaning. The first arises if the patentee has chosen to be his or her own lexicographer . . . [t]he second is where the term or terms chosen by the patentee so deprive the claim of clarity that there is no means by which the scope of the claim may be ascertained from the language used.[cxxxvi]

Applying these rules, the court found that the patentee had varied his use of the term "heading" in the specification, sometimes to mean the heading of the motor and

sometimes to mean the heading of the boat. Accordingly, he was not limited to a narrow interpretation of the term. For the use of the word "coupled," the court found that the specification did not support limiting its use in the claim to a physical coupling. "[M]ere inferences drawn from the description of an embodiment of the invention cannot serve to limit claim terms."[cxxxvii] The court distinguished *Gentry Gallery* because it "considers the situation where the patent's disclosure makes crystal clear that a particular (i.e. narrow) understanding of a claim term is an 'essential element of [the inventor's] invention.' "[cxxxviii]

Zebco also relied on the prosecution history of other claims that distinguished a reference because it did not use a " 'heading signal . . . dependent solely on the heading of the motor, and totally independent of the orientation of the vessel.' " This statement in the prosecution history was ignored, as the claims to which it related explicitly required a physical coupling between the compass and the motor.

Thus, the court allowed the claim to cover Zebco's device, which used a magnetometer in a foot pedal as the direction-indicating device even though the only embodiment described by Johnson used a compass physically coupled to the motor housing.

A different result was reached later the same year in *Wang Laboratories, Inc. v. America Online Inc.*[cxxxix] This case turned on the definition of the word "frame." The invention concerned an apparatus that displayed frames of video information from a central computer on a display device. Wang described only a character-based method for displaying the frames in which the display screen was divided into a matrix of characters and graphic information was generated by using a mosaic of characters. Both parties agreed that AOL did not use a character-based technique but, instead, used a bit-mapped method in which each picture element on the screen could be individually addressed.

Wang argued that "even if the specification [was] deemed to describe only the character-based protocol the claims should not be so limited, as the interchangeability of character-based and bit-mapped information protocols was known at the time the invention was made."[cxl] Wang also argued that "the character-based protocol [was] simply a 'preferred embodiment,' and that the embodiment described in the specification [did] not set the boundaries of the claims."[cxli] The court, citing *General American Transportation Corp. v. Cryo-Trans Inc.*,[cxlii] stated that when the teaching of the specification was " 'not just the preferred embodiment of the invention [but] the only one described' . . . the claims were correctly interpreted as limited thereto."[cxliii] Furthermore, the court noted that prosecution history concerning a patent by Fleming supported its argument that the character-based protocol was required. This prosecution history, however, was in a parent application of the subject patent. The court found the reference to the parent to be justified because "the subject matter [was] common to the continuation-in-part application, and argument concerning the Fleming reference was correctly viewed as applying to the common subject matter."[cxliv]

A case decided in 2000 is noteworthy for the concurring opinion by Judge Newman. In *Reiffin v. Microsoft*,[cxlv] Microsoft asserted that Reiffin's claim in a continuation-in-part patent was invalid because it was not supported by the description in the parent of the continuation-in-part. Microsoft stated that the claim did not meet the

"omitted element test" announced by the Federal Circuit in *Gentry Gallery.*[cxlvi] This test, as viewed by Microsoft, " 'prevents a patent owner from asserting claims that omit elements that were essential to the invention as originally disclosed.' "[cxlvii] In a *per curiam* decision, the court remanded the case for further development of the record, stating that the validity of the claim should be determined from the patent itself, not from its parent.[cxlviii]

Judge Newman criticized the majority for failing to address the "omitted element test." "The issues concerning the 'omitted element test' were fully presented on appeal, and our reversal of the summary judgment on a different ground does not answer the question that is central to this case. Our silence on whether this is a correct rule of law will be singularly mischievous, for it relates to Mr. Reiffin's entitlement to his earlier filing date . . . an issue that the parties expect to be raised on the case's return to the district court."[cxlix] Judge Newman stated that the district court's interpretation of *Gentry Gallery* was erroneous. "The *Gentry Gallery* decision did not create a new requirement of claim content, or change the long-standing law and practice of claim drafting. *Gentry Gallery* is simply one of many decisions holding that, as quoted by the district court, 'claims in an application which are broader than an applicant's disclosure are not allowable.' "[cl]

Even a broad description in the specification, however, does not guarantee that a narrow invention within that description can be claimed. *Purdue Pharma*[cli] concerned a sustained-release oral morphine formulation that needed to be administered only once a day. Purdue amended a pending application to claim specific characteristics of a formulation that was being used by a competitor. While the characteristics were within the scope of the patent description, Purdue did not discuss the particular characteristics in its patent specification. Using a woodsman's analogy, the court laid out the requirements of Section 112 for a broad invention disclosure: "As *Ruschig* makes clear, one cannot disclose a forest in the original application and then later pick a tree out of the forest and say 'here is my invention.' In order to satisfy the written description requirement, the blaze marks directing the skilled artisan to that tree must be in the originally filed disclosure."[clii]

The court went on to provide additional insight into the relationship between the written description and enablement requirements of Section 112. "What the '360 patentees have done is to pick a characteristic possessed by two of their formulations, a characteristic that is not discussed even in passing in the disclosure, and then make it the basis of claims that cover not just those two formulations, but any formulation that has that characteristic. This is exactly the type of overreaching the written description requirement was designed to guard against."[cliii] Thus, even though the specification contained a description of the invention adequate to meet the enablement requirement, it was not sufficient to meet the written description requirement and thus could not support a claim for the invention. This application of the written description requirement concerned newly added features. The application was directly in line with the original purpose of the requirement, priority determination, and illustrated the difference between the written description and enablement requirements. To meet the written description requirement, it is not sufficient for an invention added during prosecution to be enabled,

the specific invention being claimed must also have been specifically described in the application.

From the above cases, it is apparent that a patent practitioner should not be either too specific or too inclusive in describing an invention. In addition, the practitioner must be careful about the use of absolutes and about excessively praising aspects of the described invention. This was the issue in *SciMed Life Sys. v. Advanced Cardiovascular Sys*.[cliv] The invention in this case was a dual-lumen balloon catheter. The two lumens could occur in two configurations, side-by-side and coaxial. While the claim language did not specify a particular configuration, the court limited the claim to cover only the coaxial configuration because of explicit statements made in the patent specification. The court found, for example, that SciMed had distinguished its invention over side-by-side configurations by stating its advantages over those configurations. In addition, the court noted many instances in the specification where SciMed refers to its catheters as being coaxial or annular. The most compelling statement for the court, however, was this: "'[t]he intermediate sleeve structure defined above is the basic sleeve structure for *all embodiments of the present invention contemplated and disclosed herein*—namely, an inner core tube bonded to a distal portion of the main catheter shaft, with an outer sleeve forming an annular continuation of the inflation lumen through the main shaft between the core tube and outer sleeve.'"[clv] The court found that because the patent specification explicitly limited *all embodiments* of the invention to the coaxial dual-lumen structure, the claims could not encompass any other structure.

To rebut SciMed's contention that the court read limitations from the specification into the claim, the court stated that "[w]here the specification makes clear that the invention does not include a particular feature, that feature is deemed to be outside the reach of the claims of the patent, even though the language of the claims, read without reference to the specification might be considered broad enough to encompass the feature in question."[clvi] Thus, in *SciMed*, the court amplified its decision in *Gentry Gallery* to create the doctrine of prosecution disclaimer, which was similar to prosecution history estoppel except that it applied to the literal meaning of a claim and not just to its meaning under the doctrine of equivalents. In the *Phillips* decision, the court made it clear that the specification must be considered to determine what the patentee may have disclaimed.[clvii]

In *Interactive Gift Express v. Compuserve, Inc.*,[clviii] the court attempted to address the difference between interpreting a claim in light of the specification and reading a limitation from the claim into the specification. The subject matter of this case was a system for remote delivery of information in material objects. The invention, as described in the specification, allowed a customer to purchase a compact disc containing music or programs at an "information manufacturing machine." The information recorded on the compact disc was provided from a remote source. The court construed the meaning of five terms, "point of sale location," "material object," "information manufacturing machine," "authorization code," and "real-time transaction."

To provide guidance on interpreting a claim limitation without reading a limitation from the specification into the claim, the court stated, " '[w]e recognize that there is sometimes a fine line between reading a claim in light of the specification, and reading a limitation into the claim from the specification.' In locating this 'fine line' it is

useful to remember that we look 'to the specification to ascertain the meaning of the claim term as it is used by the inventor in the context of the entirety of the invention,' and not merely to limit a claim term."[clix]

For example, in interpreting the claim term "point of sale location," the question was whether this location could be in a home. The court analyzed the specification and determined that the definition provided by the inventor did not preclude the point of sale location from being in a home and further noted that one of the embodiments described a vending machine that could be used in a home.[clx] The court found that "the intrinsic evidence unambiguously allows a home to serve as a point of sale location." Compuserve had cited dictionary definitions of "point of sale" in support of its contention that a "point of sale location" could not be in a home. Because the court found no ambiguity after analyzing the intrinsic evidence, it held that there was no need to consider this extrinsic evidence. Thus, in *Compuserve*, the court's position was that dictionaries should be used only after consulting the intrinsic evidence.

The court's interpretation of the term "material object" provided another example of claim construction. One contested feature of the "material object" was whether it was removable from the "information manufacturing machine" (IMM). IGE contended that the patent specification did not require that it be removable, but the court found otherwise. "The emphasis of the specification on distribution and sale consistently reveals that the material objects are intended to be separate from the IMM, removed from the IMM, and used apart from the IMM."[clxi] Thus, rather than just relying on the words of the specification, the court looked to the intent of the inventor as ascertained from the intended use of the invention.

In *Bell Atlantic Network Services, Inc. v. Covad Communications Group, Inc.*,[clxii] the court made it clear that a claim term does not need to be explicitly defined to affect the scope of a claim. This case revolved around the meaning of the phrase "plurality of different modes." Bell Atlantic, in the patent specification, described only three modes. In asserting the claims, Bell Atlantic contended that the term "mode" should be given a broad meaning, encompassing more than the three described modes. In particular, Bell Atlantic argued that the term "mode" should be construed to refer to "the rate of data transfer (as opposed to the bandwidth) within each of the three broad categories" represented by the three described modes.[clxiii]

The court's summary of the law of claim interpretation emphasized that there is a " 'heavy presumption' in favor of the ordinary meaning of claim language as understood by one of ordinary skill in the art. . . . This presumption is overcome: (1) where the patentee has chosen to be his own lexicographer, or (2) where a claim term deprives the claim of clarity such that there is 'no means by which the scope of the claim may be ascertained from the language used.' "[clxiv] In this instance, the court found the presumption overcome for the second reason: The "ordinary meaning of the non-technical term 'mode' is sufficiently broad and amorphous that the scope of the claim language can be reconciled only by recourse to the written description."[clxv]

Upon reviewing the patent specification the court found that Bell Atlantic had used the term "rate" to refer to the data transfer rate within a channel while "mode" was used to refer to "asymmetrical and bi-directional communications."[clxvi] Although neither

of these terms had been explicitly defined in the specification, the court found the claims limited to these interpretations. "Thus, when a patentee uses a claim term throughout the entire patent specification, in a manner consistent with only a single meaning, he has defined that term 'by implication.' "[clxvii] In this case, as in *Interactive Gift Express*, the court looked to the intent of the inventor as discerned from reading the entire patent specification to determine the meaning of a claim term.

Guidance on the type of language needed to implicitly define a claim term was provided in *On Demand Machine Corp. v Ingram Industries, Inc.*[clxviii] In this case, the defendant, Ingram argued that the claim term "customer" meant the "person who orders and immediately receives the printed-to-order book,"[clxix] while On Demand argued that the term also included the resellers to whom Ingram sold its product. The court declined to adopt the broader definition, finding that, while On Demand had not explicitly disavowed the broader definition, "when the scope of the invention is clearly stated in the specification and is described as the advantage and distinction of the invention, it is not necessary to disavow explicitly a different scope."[clxx] This case expands the language that may be interpreted as disclaiming claimed subject matter. Now, in addition to avoiding imperative terminology such as "must" and "necessary" in describing an invention, practitioners need to be careful in describing the advantages of the invention.

In *Johnson*,[clxxi] the inconsistent use of the term "heading" entitled the inventor to an interpretation that encompassed both the heading of the boat and the heading of the motor. Similarly, in *Rexnord Corp. v. Laitram Corp.*,[clxxii] use of the term "portion" to refer to both an integral portion and a separate portion allowed the court to find that the specification—and, thus, the claims—supported both meanings of the word. In addition, the court noted that this dual meaning was consistent with the dictionary definition. In *Rexnord*, the dictionary definition was used to determine the plain meaning of the claim term; it was not extrinsic evidence. Comparing *Johnson* and *Rexnord* to *Bell Atlantic* leads to the conclusion that sloppiness is rewarded; the ambiguous use of a term results in a broader claim.

The Federal Circuit reached a similar decision in *Sandisk Corp. v Memorex, Inc.*[clxxiii] This case concerned the meaning of the term "each sector," referring to sectors in a flash memory device that mimicked the sectors of a computer disk. Ritek, the predecessor of Memorex, contended that the claim term "each sector" meant every sector in the flash memory device. Sandisk, on the other hand contended that it meant only those sectors having the claimed feature. The court found that neither of these definitions was explicit in the specification and that the term "each sector" was not used consistently. The court stated, "[a]n ambiguous disclaimer, however, does not advance the patent's notice function or justify public reliance and the court will not use it to limit a claim term's ordinary meaning."[clxxiv]

After deciding cases in which the claims were limited by statements made in the Objects of the Invention section of the specification, by a narrow specification, or by a definition implied from the consistent use of a term, the Federal Circuit abruptly changed course, handing down several decisions that, at least on their surface, seem to contradict these earlier opinions.

In *CCS Fitness Inc. v. Brunswick Corp.*,[clxxv] the court found that more than just consistent use of a term was needed for the term to be defined by that usage. " '[M]ere inferences drawn from the description of an embodiment of the invention cannot serve to limit claim terms.' . . . 'Without an express intent to impart a novel meaning to a claim term, the term takes on its ordinary meaning.' "[clxxvi] In *Texas Digital Sys. Inc. v. Telegenix Inc.*,[clxxvii] the Federal Circuit made it clear that dictionaries, encyclopedias, and treatises were not extrinsic evidence but were essential tools for determining "the ordinary and customary meanings of claim terms."[clxxviii] Once a dictionary has been consulted, however, the patent specification must still be consulted to determine which of the dictionary definitions applies.

> Because words often have multiple dictionary definitions, some having no relation to the claimed invention, the intrinsic record must always be consulted to identify which of the different possible dictionary meanings of the claim terms in issue is most consistent with the use of the words by the inventor . . . . If more than one dictionary definition is consistent with the use of the words in the intrinsic record, the claim terms may be construed to encompass all such consistent meanings.[clxxix]

In *Tvio Inc. v. Echostar Comm. Corp.*[clxxx] the defendant attempted to limit the interpretation of the claim term "object" to be an object-oriented programming object based on an example in the specification. Based on extrinsic evidence - namely expert testimony - the court found that a person of ordinary skill in the art would understand the term to have a broader meaning.[clxxxi] In a footnote,[clxxxii] the court recognized that a claim construction based on extrinsic evidence is essentially a finding of fact to which the court typically accords deference. While it made no difference in this case because the Federal Circuit upheld the decision by the lower court, this footnote may be significant in other cases where claim construction - which is a question of law - involves extrinsic evidence which must be afforded some deference.

The Federal Circuit went in a different direction in *Prima Tek II LLC v. Polypap S.A.R.L.*[clxxxiii] This case provides a sample analysis for when a patentee has not explicitly disclaimed subject matter by limiting statements in the patent specification. One of the disputed terms in this patent was "floral holding means." In finding that the patentee had not limited this term to any particular material or size, the court stated:

> The written description only states that the floral holding material "may be" (not must be) the type of material commonly referred to in the art as floral foam or soil. Indeed, the many uses of the term throughout the '856 patent are consistent with a broader definition, one encompassing material of any shape or type . . . . ['856 patent] col 3, ll. 50-52 ("The floral holding means [sic] 18 may be the type of material commonly referred to in the art as floral foam or Oasis™ or may be soil . . . ."). The written description makes quite clear that the open-ended examples of "floral holding material" are merely illustrative; that is, they do not exhaustively delineate the "floral holding material" that is clearly defined in the claims.[clxxxiv]

It is useful to compare these statements with similar open-ended statements concerning the position of the controls in *Gentry Gallery*.[clxxxv] In that case, similar open-ended statements were interpreted as limiting the controls to being on the console.

Another useful comparison to *Gentry Gallery* is *SunRace Roots Enter. Co. v. SRAM Corp.*[clxxxvi] In this case, the question was whether the claim term "shift actuator" was defined in the specification to necessarily include a cam. In finding that no cam was required, the Federal Circuit cited four passages from the specification, including the following: "A rotary cam member 74 having a generally helical operating face is at the heart of the rear handgrip shift actuator." The court also quoted one of the stated objects of the invention as "to provide a bicycle derailleur shifting system having a handgrip shift actuator embodying a generally helical cam which defines the derailleur mechanism movements."[clxxxvii] Again, while similar statements made in *Gentry Gallery* were found to limit the claim term, these statements were not. In providing the rationale for this interpretation, the court stated:

> The quoted statements do not sufficiently evidence an intention to depart from the ordinary meaning of "shift actuator." The first two statements simply detail some of the goals of the invention that are achieved by some of the apparatus claims. Those are not the only goals of the invention, however. Some of the recited goals relate to compensation for lost motion and providing automatic overshift capabilities and do not specifically address the use of cams. The third and fourth definitions are more problematic for SRAM, but they still do not define the term shift actuator, nor do they constitute expressions of clear exclusion. While SunRace would characterize the statement that every handgrip shift actuator contains a cam member as definitional, we believe it is more properly characterized as descriptive of the preferred embodiments . . . .[clxxxviii]

It is not clear how this case can be reconciled with *Gentry Gallery,* which is still cited for the proposition that limiting use of a term in the specification can limit that term as it is interpreted in a claim.

Two lines of cases developed after the *Texas Digital* decision.[clxxxix] One line advocated determining the plain meaning of a claim term using dictionaries, before consulting the specification[cxc] while the other line used the intrinsic record as the primary source for claim interpretation.[cxci] In these cases, dictionaries were consulted only if the meaning of the claim term was unclear from the specification and prosecution history. The court resolved this internal conflict with the *en banc Phillips* opinion[cxcii] in favor of reliance on the intrinsic record.

One concern of the court in *Phillips* was the mischief that could be caused in extrinsic evidence were to be widely used to interpret claim terms. "[T]here is a virtually unbounded universe of potential extrinsic evidence of some marginal relevance that could be brought to bear on any claim construction question. In the course of litigation, each party will naturally choose the pieces of extrinsic evidence most favorable to its cause, leaving the court with the considerable task of filtering the useful extrinsic evidence from the fluff."[cxciii]

Another concern was that "undue reliance on extrinsic evidence poses the risk that it will be used to change the meaning of claims in derogation of the 'indisputable public records consisting of the claims, the specification and the prosecution history,' thereby undermining the public notice function of patents."[cxciv] In this regard, the court further stated that:

> The main problem with elevating the dictionary to such prominence is that it focuses the inquiry on the abstract meaning of words rather than on the meaning of the claim terms within the context of the patent. Properly viewed, the "ordinary meaning" of a claim term is its meaning to the ordinary artisan after reading the entire patent. Yet heavy reliance on the dictionary divorced from the intrinsic evidence risks transforming the meaning of the claim term to the artisan into the meaning of the term in the abstract, out of its particular context, which is the specification.[cxcv]

While, in *Phillips*, the court emphasized the importance of the intrinsic record, it did not completely forbid the consulting dictionaries.

> [A] judge who encounters a claim term while reading a patent might consult a general purpose or specialized dictionary to begin to understand the meaning of the term, before reviewing the remainder of the patent to determine how the patentee has used the term. The sequence of steps used by the judge in consulting the various sources is not important; what matters is for the court to attach the appropriate weight to be assigned to those sources in light of the statutes and policies that inform patent law.[cxcvi]

Thus, where there is a disputed claim term, the judge must look to the intrinsic record—the specification and the prosecution history—as the primary source to determine the meaning of a claim term. *Phillips* goes beyond just disputed claim terms, however, to require that *every* term in *every* claim must be interpreted in light of the specification.

> The claims, of course, do not stand alone. Rather they are part of a "fully integrated written instrument," consisting principally of a specification that concludes with claims. For that reason, claims "must be read in view of the specification, of which they are a part." As we stated in *Vitronics*, the specification "is always highly relevant to the claim construction analysis. Usually it is dispositive; it is the single best guide to the meaning of a disputed term."[cxcvii]

Even though the specification is to be consulted in all cases to determine the meaning of claim terms, there may still be disagreement as to the correct meaning. In *Alloc Inc. v. ITC*,[cxcviii] for example, the Federal Circuit proved its often-stated maxim that there is "a fine line between reading a claim in light of the specification, and reading a limitation into the claim from the specification." The majority of the court interpreted the claim to be narrowed by the specification because "the specification [made] clear at various points that the claimed invention is narrower than the claim language might imply."[cxcix] Judge Schall, in his dissent, found the same language to be open-ended and not limiting.[cc]

The case concerned joining flooring products and, in particular, whether all of the claims required "play" between assembled floorboards. Believing the case to be very similar to *SciMed*,[cci] the majority found prosecution disclaimer in the objects of the invention and the criticism, in the specification, of flooring products without play. Thus, the majority interpreted the claims as requiring play even though the word was not used in any of the claims. In his dissent, Judge Schall noted that the stated objects of the invention used the permissive word "can" and not limiting words such as "must." Furthermore, he noted that the products without play that were criticized by the inventor were products requiring permanent attachment using glue or metal fasteners, and that they were criticized for requiring permanent attachment, not for failing to exhibit play.

The Federal Circuit has been generally consistent in its decisions following *Phillips* regarding the primacy of the written description to define claim terms. In *Nystrom v. Trex, Co. Inc*[ccii]*.,* for example, the court found that, through consistent usage in the specification, the patentee had limited the word "board" to mean "wood decking material cut from a log,"[cciii] while admitting that the plain meaning of the term may be broader. The court further clarified its holding in *Phillips* by defining "ordinary meaning." Quoting *Phillips*, the court stated, "[t]he ordinary and customary meaning of a claim term 'is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention.' The person of ordinary skill in the art views the claim term in the light of the entire intrinsic record."[cciv] Thus, the ordinary meaning of a claim term is the meaning that the term would have to a person or ordinary skill in the art after reading the specification and prosecution history. The court limited the term "board" to its usage in the specification stating, "[w]hat *Phillips* now counsels is that in the absence of something in the written description and/or prosecution history to provide explicit or implicit notice to the public--i.e. those of ordinary skill in the art--that the inventor intended a disputed term to cover more than the ordinary and customary meaning revealed by the context of the intrinsic record, it is improper to read the term to encompass a broader definition simply because it may be found in a dictionary, treatise or other extrinsic source."[ccv] More simply stated, "[b]roadening of the ordinary meaning of a claim term in the absence of support in the intrinsic record indicating that such a broad meaning was intended violates the principles articulated in *Phillips*."[ccvi]

LG Electronics, Inc. v. Bizcom Electronics, Inc.[ccvii] provides an example of how references that would normally be considered extrinsic can be used as intrinsic evidence to establish the "ordinary meaning" of a claim term. In this case the patentee had referred to a particular industry standard in the patent specification but did not explicitly incorporate that standard by reference.[ccviii] The court stated, "'[w]hen prior art that sheds light on the meaning of a term is cited by the patentee, it can have particular value as a guide to the proper construction of the term, because it may indicate not only the meaning of the term to persons skilled in the art, but also that the patentee intended to adopt that meaning.' Although we have concluded that the patentee did not expressly adopt the definition 'requesting agent' in the incorporated industry standard, that standard remains relevant in determining the meaning of the claim term to one of ordinary skill in the art at the time the patent application was filed, and it is treated as intrinsic evidence for claim construction purposes." [ccix]

In *In re Johnson*,[ccx] the court reaffirmed that dictionaries can be consulted but reiterated that the dictionary definition must consistent with the definition provided by the intrinsic record. In this case, the patentee contended that the dictionary definition of the word "pipe" adopted by the PTO was overly broad because "the prior art structures would not be understood as included in the meaning of 'pipe' by persons of skill in the field of the invention. In reply, the court noted that "[i]t is well established that dictionary definitions must give way to the meaning imparted by the specification, but in this case Mr. Johnson himself gave 'pipe' the broad meaning that he now criticizes. He states in the specification that his pipes may be used as overpasses, storage buildings, homes, silo and water tanks,…."[ccxi]

An analysis based on *Texas Digital*, which relied on a dictionary definition, was affirmed by the Federal Circuit because the dictionary definition was supported by the intrinsic record. In *Mangosoft, Inc. v. Oracle Corp.*[ccxii] Mangosoft attempted to read the term "local drive" to encompass a network drive. The district court had used a dictionary definition to construe the term to require that the drive be attached to a single computer.[ccxiii] Although the district court did not consult the intrinsic record in arriving at this definition, the Federal Circuit found no error because the dictionary definition was supported by the specification and prosecution history.[ccxiv]

Where a claim term is not defined in the specification, courts may look to dictionaries to determine the meaning of the term. In *MIT v Abacus Software*,[ccxv] the term "scanner" was interpreted by the district court as having two un-recited limitations to a person of ordinary skill in the art at the time of the invention, "first, it must have 'relative movement between the scanning element and the object being scanned,' and second, the 'color original' that the scanner scans must be 'placed in close proximity to the scanner.'"[ccxvi] The Federal Circuit analyzed the term in view of definitions from four dictionaries, including two technical dictionaries, a prior-art patent and expert testimony and affirmed the district court's interpretation.[ccxvii]

Similarly, in *Helmsderfer v Bobrick Washroom Equipment, Inc.*[ccxviii] the court allowed a dictionary to be consulted to determine the meaning of a claim term when the claim term was not defined in the specification or the prosecution history. "When the intrinsic evidence is silent as to the plain meaning of a term, it is entirely appropriate for the district court to look to dictionaries or other extrinsic sources for contest – to aid in arriving at the plain meaning of a claim term."[ccxix]

While claim differentiation is often used in claim construction, the claims of an application form part of the specification and, thus, may be consulted to determine the meaning of a claim term in the same way as any other part of the specification. As described above, claim differentiation provides a presumption that different words used in different claims have different meanings. A corollary to this statement is that the same word used in different claims is presumed to have the same meaning. This corollary was used by the court in *Schoenhaus v. Genesco, Inc.*[ccxx] to interpret the claim term "orthotic device." The patentee asserted a broad definition of the claim term encompassing both a shoe insert and an integrally formed part of a shoe "designed to activate or supplement a weakened or atrophied limb or function."[ccxxi] Furthermore, the specification contained support for this definition: "[i]n support of this argument, plaintiffs point to language in the specification that states that their 'invention' is both an insert and a 'shoe built to have

the shape of the interior of the insert.'"[ccxxii] The court, however, limited the definition to an insert because the "orthotic device" in claim 2 could not be an integral part of a shoe.[ccxxiii] Thus, even though there were clear statements in the specification supporting the patentee's definition, the court found that the conflicting use of the term in one claim limited its meaning in another claim.

Where the specification and the claims providing competing claim interpretations, the interpretation derived from the patent specification controls. In *Semitool, Inc. v. Dynamic Micro Sys. Semiconductor Equip.*,[ccxxiv] the terms "processing chamber" and "processing vessel" were construed. While claim 28 recited "a processing chamber within the processing vessel," indicating that the two terms were distinct, the court found that they were not.[ccxxv] Because the terms were used synonymously in the specification and because the specification described the processing chamber as being coextensive with the processing vessel, the court treated these terms as synonyms for purposes of claim interpretation.[ccxxvi]

It is clear that a claim term can be limited by an explicit or implicit definition in the specification. Other uses of a claim term, however, can also affect its interpretation. In *nCube Corp. v. SeaChange, Int'l Inc.*,[ccxxvii] for example, statements in the specification that "diverged from" the preferred embodiment required an interpretation of the claim term that was broader than the preferred embodiment. In this case, the disputed claim term was "upstream manager." The specification described only a single embodiment but the court found that that the description "encompasses divergence from that embodiment."[ccxxviii] The construction proposed by the defendant would have limited the meaning of this term to the recited meaning in claim 2.[ccxxix] Thus, a combination of claim differentiation and broadening language in the specification resulted in a broader claim interpretation.

Prosecution disclaimer in a parent application can limit claims in a child application. In *Andersen Crop. v. Fiber Composites*, [ccxxx] the Federal Circuit found that a description in the parent application which indicated that a feature was "not merely a preferred embodiment but a critical element" limited the interpretation of that feature in the child application.[ccxxxi] This case is also instructive regarding the relative weight given to claim differentiation and prosecution disclaimer. The patentee had used different terminology in different claims and asserted that these claims must be interpreted differently under the doctrine of claim differentiation.[ccxxxii] In response, the court stated, "[t]hat inference would be a plausible one in the absence of evidence to the contrary, but here there is powerful evidence to the contrary, as we have discussed. In such cases, we have held that 'the written description and prosecution history over come any presumption arising from the doctrine of claim differentiation.'"[ccxxxiii] Prosecution disclaimer in a parent application is also relevant in *Ventana Medical Syst. Inc. v. BioGenex Labs. Inc.*[ccxxxiv] In this case, however, the terminology used in the parent application was different from that used in the child, and the court noted that "the doctrine of prosecution disclaimer generally does not apply when the claim term in the descendant patent uses different language."[ccxxxv]

In *Ormco*, the court found that the prosecution history of a parent application can be used to interpret a claim term in a child application even when the claim terms in parent and child are different. This case concerned software for designing orthodontic

appliances. The court found that both the specification and prosecution history of the parent application limited the invention to automatic determination of the final position of the teeth. A child application contained a claim explicitly requiring intervention by an operator. The court stated, "[t]he situation here involves specifications that in all respects tell us what the claims mean, buttressed by statements made during prosecution in order to overcome a rejection over prior art. Accordingly, to attribute to the claims a meaning broader than any indicated in the patents and their prosecution history would be to ignore the totality of the facts of the case and exalt slogans over real meaning."[ccxxxvi]

Another case to consider the effects of statements made in another application is *Inpro II Licensing SARL v. T-Mobile USA, Inc*.[ccxxxvii] The claim term to be interpreted in this case was "host interface." The specification described the host interface as being a "parallel bus interface" and also disparaged serial bus interfaces in the background section as being "time consuming and error prone."[ccxxxviii] In addition, the court noted prosecution disclaimer from a related application in which, in response to an office action, the patentee stated, "[t]o more clearly distinguish, applicants have amended claim 1 to decidedly narrow the scope of the claim, so it does not read on series connections, as in [the prior art]."[ccxxxix] The court found that these statements concerned the "broad technological basis of [the] related applications," and were not restricted to the particular rejected claims. The specification of the patent in suit, however, described a mode in which a serial bus could perform some of the functions of the host interface but that did not meet the stated purpose of the invention, i.e. providing a host interface that was not "time consuming and error prone." Thus, the court found that this disclosure did not overcome the prosecution disclaimer in the specification and in the related application and affirmed the district court's interpretation of "host interface" as being a parallel bus.[ccxl]

In *MBO Laboratoies Inc. v. Becton Dickinson & Co.*,[ccxli] The Federal Circuit indicated that, in order for prosecution disclaimer to limit a claim, there must be some language in the claim to support that limitation. Here, the district court applied a construction of the term "immediately" to claims that did not include that term.[ccxlii] The Federal Circuit reversed this construction because the district court failed to "identify 'a textual reference in the actual language of the claim with which to associate a proffered claim construction.'"[ccxliii]

The Federal Circuit provided a procedure by which prosecution disclaimer may be rescinded in *Hakim v. Cannon Avent Grp. PLC*.[ccxliv] In this case, the patentee had narrowed a limitation in a first application and then filed a continuation application with the express purpose of broadening the claim by removing the added limitation.[ccxlv] He did not, however, "specifically point out to the examiner that he no longer intended to be limited to the specific mechanism that he had previously argued was the distinguishing feature of his invention."[ccxlvi] The continuation application was allowed without further prosecution. The Federal Circuit affirmed the district court's interpretation of these claims as including the narrowing limitation because, "[a]lthough a disclaimer made during prosecution can be rescinded, permitting recapture of the disclaimed scope, the prosecution history must be sufficiently clear to inform the examiner that the previous disclaimer, and the prior art that it was made to avoid, may need to be revisited. 'The public notice function of a patent and its prosecution history requires that a patentee be

held to what he declares during the prosecution of his patent. A patentee may not state during prosecution that the claims do not cover a particular device and then change position and later sue a party who makes that same device for infringement.'"[ccxlvii] Thus, in order to remove a previous amendment and rescind its prosecution disclaimer, it is necessary to specifically point out that the examiner needs to revisit the prior art reference(s) asserted in the prior rejection and it may also be desirable to describe why the removed limitation is unnecessary in order to overcome the reference(s).

One of the more significant post-*Phillips* decisions is *LizardTech.* In this case, the court provided rules for determining when a narrow description in the specification will limit the scope of a claim based on that description. Claim 21 of the patent was found by the court to cover, generically, methods for making a seamless discrete wavelet transform (DWT).[ccxlviii] The court also found this claim invalid because it was not enabled under 35 U.S.C. § 112, first paragraph and/or did not satisfy the written description requirement, over the entire claimed scope. LizardTech contended that this reading of §112, first paragraph was improper, asserting that it "requires only that each individual step in a claimed process be described adequately."[ccxlix] In other words, enabling one embodiment of the invention allows a generic claim that covers other embodiments. The court, however, disagreed, stating that such an interpretation "would lead to sweeping, overbroad claims because it would entitle an inventor to a claim scope far greater than what a person of skill in the art would understand the inventor to possess or what a person of skill in the art would be enabled to make or use."[ccl] In finding claim 21 invalid for lack of enablement, the court stated "The single embodiment would support such a generic claim only if the specification would 'reasonably convey to a person skilled in the art that [the inventor] had possession of the claimed subject matter at the time of filing,' and would 'enable one of ordinary skill in the art to practice the 'full scope of the invention.' ' To hold otherwise would violate the Supreme Court's directive that 'it seems to us that nothing can be more just and fair, both to the patentee and the public that the former should understand and correctly describe, just what he has invented and for what he claims a patent.' "[ccli]

In *ICU Medical* the Federal Circuit applied *Lizardtech* to find a claim invalid for lack of written description rather than for lack of enablement. The invention in *ICU Medical* was a valve for use in dispensing medication using an intravenous (IV) setup. The court found that the specification disclosed only valves that used spikes to pierce a seal on a vial of medicine. The claims in question, however, did not recite the spike. Because there was no disclosure of a spikeless valve, the Federal Circuit affirmed the District Court decision, finding the spikeless claims to be invalid for lack of written description.[cclii]

These decisions have the potential to make it more difficult to draft patent applications. Prior to *Lizardtech*, an overly broad claim could be limited by the specification or prosecution history based on prosecution disclaimer. According to these cases, however, an overly broad claim may be invalid. These cases also seem to be a step backward as they requires extrinsic evidence, in the form of expert opinions as to what scope a skilled person would ascribe to a claim, based on its prosecution history. This seems to be directly opposed to the court's statement in *Phillips* that "undue reliance on extrinsic evidence poses the risk that it will be used to change the meaning of claims in

derogation of the 'indisputable public record consisting of the claims, the specification and the prosecution history.' Thereby undermining the public notice function of patents."[ccliii]

It is too early to tell whether the *LizardTech* line of cases will be broadly applied, limited to the predictable arts or interpreted as being limited to its particular fact situation. These cases may be interpreted as reactions to an obvious case of overreaching. LizardTech had described one method for calculating the DWT and had claims limited to that method. Thus, by invalidating claim 21, the court did not invalidate the entire patent. Instead, they limited the inventor to a claim scope that it believed was appropriate for the invention described in the specification. Thus, if the inventor had been more expansive in the disclosure, he may have been able to support a broader claim scope.

It is interesting to compare *LizardTech* to *Capon v Eshhar.*[ccliv] The latter case arose from an interference. The court found a generic claim directed to the production of chimeric genes to be valid in spite of a finding by the PTO that "neither party's specification provides the requisite description of the full scope of the chimeric DNA or encoded proteins,…."[cclv] Here, the court found that the Board had improperly "refused to consider the state of scientific knowledge."[cclvi] Thus, in accord with *LizardTech,* the proper inquiry is not what the specification discloses but what the *skilled person* would understand the invention to be based on the specification.

In addition, however, the Board found the claims to be invalid under 35 U.S.C. § 112, first paragraph because they "may include inoperative species." The court dismissed this objection stating "It is not necessary that every permutation within a generally operable invention be effective in order for an inventor to obtain a generic claim, provided that the effect is sufficiently demonstrated to characterize a generic invention."[cclvii] It is unclear what is needed in the specification to characterize a generic invention but from *LizardTech* and *Capon*, it is doubtful that a single embodiment would be sufficient.

Effect of KSR v. Teleflex

The Supreme Court's decision in *KSR v. Teleflex*[cclviii] significantly affects how patent applications are drafted. Knowledge of the invention, the prior art and the patent owner's goals for the product and the patent(s) covering it are even more important after this decision. For patent applications that are more than placeholders in the owner's portfolio, prior art searches are no longer optional. In *KSR*, the Court noted that, because the PTO was not aware of one of the two references used to invalidate the Teleflex patent, the presumption of validity "seems much diminished."[cclix] In addition to the benefits regarding knowledge of the invention, a through search of the prior art may also uncover references that teach away from combining certain elements of the invention. As described below, these references may be particularly useful to overcome rejections under 35 U.S.C. § 103 for obviousness. Because the *KSR* decision elevates "teaching away" to the same level as the secondary factors of *Graham v. Deere*,[cclx] it has increased the importance of this argument both in litigation and before the PTO.

The *KSR* decision allows examiners more latitude in citing references against a claim. The examiner is no longer limited to text references in technologies related to the

claim and no longer needs to find a teaching, suggestion or motivation to combine references in order to support an obviousness rejection.

> Often, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue. To facilitate review, this analysis should be made explicit. See *In re Kahn*, 441 F. 3d 977, 988 (CA Fed. 2006) ("[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness"). As our precedents make clear, however, the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.[cclxi]

Where an examiner combines references having no explicit or implicit suggestion supporting their combination and, instead, relies on a "reason" that is not stated in any reference, the applicant may cite an additional reference that teaches away from the combination in order to refute the combination proposed by the examiner.

It may also be desirable to preempt such a rejection by describing the reference that teaches away from the anticipated combination in the specification. Any such description, however, must be carefully prepared as any error may create grounds for a charge of inequitable conduct. A more practical method may be to cite the reference in an information disclosure statement and use it, as described above, only if an obviousness rejection is made.

It is more important than ever to ensure that the claims are written to be patentable over the prior art. Once the closest prior art references have been identified, they should be carefully reviewed to determine which elements of the invention they disclose. The elements of the invention should then be analyzed to ensure that they are the same as in the prior art references. If the inventive element is different in any way, the attorney or agent should determine if this difference is significant for the invention and, if it is, include it at least in a dependent claim. This difference may then be used to distinguish the claimed invention from the prior art.

The inventor, of course, may be the best source for information as to whether and how particular elements were adapted for the invention well as other information relevant to the invention. In view of *KSR* it is important to discuss the inventive process with the inventor as early in the drafting process as possible. What problems did he or she encounter? How were they solved? What resources did the inventor use to solve the problems? If a particular solution, for example, required considerable experimentation, documentation of this experimentation may be useful to overcome an obviousness rejection. Alternatively, if the problem encountered by the inventor was not previously known, it may provide an independent basis for asserting that the claimed invention is

patentable.[cclxii] The description of the inventive process may become a key part of the patent description and may require considerable advocacy from the person drafting the application.

The *KSR* decision also changed the standard for combinations that the examiner may consider "obvious to try." Under law developed by the Federal Circuit, this type of combination was improper as it was not supported by a teaching suggestion or motivation.[cclxiii] Under the *KSR* standard, however,

> [w]hen there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense. In that instance the fact that a combination was obvious to try might show that it was obvious under §103.[cclxiv]

This is not a complete repudiation of the Federal Circuit's holding prohibiting combinations that are only "obvious to try," as it also requires 1) that there be a "design need or market pressure" to support the combination and 2) that there be a "finite number of identified, predictable solutions." It does, however, allow the examiner significant latitude in combining references.

Because the problem to be solved, or any other problem known to the skilled person, may provide the "glue" that allows an examiner to combine references,[cclxv] it is important not to admit any problem in the Background section of the application. This will almost certainly be interpreted, at least by the examiner, as an admission that the problem was known at the time the invention was made. As described above, if the problem was not known or it required special adaptation of the prior art elements, it may be beneficial to mention the problem in the Detailed Description along with evidence of its unknown nature and/or with a description of any special adaptation of the elements of the invention.

As described above, the inventor of a computer-related invention is assumed to have a relatively high level of skill in the art. While this allows a minimally described invention to be enabled, it also allows the invention to be found obvious in view of minimal descriptions in the prior art. Thus, even though an invention in this and in other predictable arts may be described without reference to detailed flow-charts or circuit diagrams, it may be desirable to include these elements to allow at least some of these details to be put into the claims in response to a minimalist prior art rejection. As described below, flow-charts are also desirable to support claim limitations that may be needed in method claims to meet the statutory subject matter *machine or transformation* test mandated by *In re Bilski*[*cclxvi*].

Evidence of secondary consideration, to the extent that it exists when the application is being drafted, may also be included in the specification. While this evidence may also be provided with a rule 132 declaration during prosecution, such a declaration may be subject to more scrutiny during prosecution of the application and enforcement of the patent than an equivalent statement in the specification. Declarations may be challenged during prosecution if they could have been made earlier. Also,

declarations may be challenged as being biased. While a statement in the specification is likely to be seen as self-serving, it may receive less scrutiny and ultimately be less limiting as it is not made in response to a specific rejection.

Effect of *In re Bilski*

In re Bilski is an en banc decision of the Federal Circuit that defines a single, bright-line test for patent eligible subject matter in method claims - the machine or transformation test. The claim at issue in *Bilski* was directed to a "method for managing the consumption risk costs of a commodity" and recited several steps - none of which involved a computer. The Federal Circuit characterized the claim as being essentially a method for hedging risk in the commodities market.

The Federal Circuit noted that a common theme throughout all of the statutory subject matter cases was to protect against the patenting of fundamental principles, such as abstract ideas, natural phenomena and mental processes. The court noted that a claim is directed to patent-eligible subject matter (1) if "it is tied to a particular machine or apparatus" or (2) if "it transforms a particular article into a different state or thing." This test has become known as the *machine or transformation test.* A claim that fails this test is directed to a fundamental principle and, therefore, is invalid under 35 U.S.C. §101.

Because Bilski had conceded that his invention did not involve a particular machine, the court did not address the machine prong of the test. As described below, other cases decided by the Federal Circuit and the C.C.P.A. provide at least some guidance as to what constitutes a particular machine. In short, it can be a known apparatus, a special-purpose computer, a general-purpose computer programmed with particular software or a computer readable storage medium programmed with particular software.

The court emphasized that it is insufficient to merely recite a machine or transformation in the claim. For the machine prong of the test, the apparatus, computer, or software must be central to the invention, i.e., the particular machine must put limits on the algorithm; it cannot be mere extrasolution activity. With regard to the transformation prong, the court noted that a process must transform "physical objects or substances" or data "representative of physical objects or substances." Again, this transformation must be central to the invention. Examples of insufficient transformation include data gathering steps and comparisons of data. Such activities do not transform data to a different state or thing. Further, data gathering is an extrasolution activity.

So what is "a particular machine or apparatus" and "a particular article?" The answer to this question is still being developed by the USPTO and the Federal Circuit.

Although *Bilski* concerned a business-method invention, the machine or transformation test applies to all method claims, not just business methods. Examples of technologies that are likely to be affected by *Bilski* include cryptography, data scrambling, data storage algorithms, spell checkers, operating system processes, etc. Such technologies involve the transformation of data that, in many instances, does not represent something that is physical or tangible. Thus, it may be difficult to claim such inventions in a manner that satisfies the transformation prong of the test. Method claims for these types of inventions may best be written with the machine prong in mind.

The problem with this approach, however, is that *Bilski* does not give any guidance on how the machine prong of the test would be applied. Prior decisions by the Federal Circuit and the Court of Customs and Patent Appeals, as well as decisions by the BPAI following *Bilski,* provide some guidance as to how this prong of the test may be applied. The first of these cases is *In re Bernhart*[cclxvii]. This case concerned an invention that translated a three-dimensional object into a two-dimensional representation and then plotted the two-dimensional data. The claim required both a computer and a plotter. This claim rather easily passes the machine prong of the test.

The examiner had rejected the claim as being directed to "mental steps." When it analyzed this claim, however, the court found that the method could not be performed mentally as it needed both the computer and the plotting apparatus.[cclxviii] Based on *Bernhart*, one possible test for patent eligible subject matter under the machine prong of the test may be whether the claimed process can be performed by a human being. If it cannot then a machine may be required.

Although it was with reference to an apparatus claim, Bernhart also found that the combination of a general purpose computer and particular software forms a particular machine.

> if a machine is programmed in a certain new and unobvious way, it is physically different from the machine without that program; its memory elements are differently arranged. The fact that these physical changes are invisible to the eye should not tempt us to conclude that the machine has not been changed. If a new machine has not been invented, certainly a "new and useful improvement" of the unprogrammed machine has been, and Congress has said in 35 U.S.C. 101 that such improvements are statutory subject matter for a patent.[cclxix]

Although *Bernhart* provides some clues as to how a claim may be drafted to require a machine, it does not give much guidance on whether that machine is a particular machine as required by the machine prong of the *Bilski* test. This part of the test is needed to ensure that the machine puts limits on the claimed invention. "[T]he use of a specific machine or transformation of an article must impose meaningful limits on the claim's scope to impart patent-eligibility."[cclxx]

Guidance on what may constitute a particular machine can be found in *In re Lowry*.[cclxxi] This case concerned a data structure that could be used to access data both hierarchically and non-hierarchically. The court found the claimed data structures to be patent eligible because they provided "tangible benefits."

Data stored in accordance with the claimed data structures are more easily accessed, stored and erased. The court further notes that, unlike prior art data structures, Lowry's data structures simultaneously represent complex data accurately and enable powerful nested operations. In short, Lowry's data structures are physical entities that provide increased efficiency in the computer operation.[cclxxii]

Because Lowry's data structures defined definite relationships having tangible benefits, they were found to be patent eligible.

In view of *Bernhart* and *Lowry*, the patent specification must be drafted to provide detailed support for the particular machine or data representing the tangible article. The particular machine should be carefully described in the specification to ensure that it can be claimed in a manner that puts limits on the claims. One way of providing such description may be by illustrating and describing a functional block diagram of the method. Such diagrams typically include hardware, software and data elements and describe a processing systems in terms of the functions it performs. The elements of the functional block diagram may be sufficiently specific to the invention to satisfy the test.

Another way of providing sufficient disclosure for the revised claim may be by illustrating and describing a specific example of an algorithm to be performed by a general purpose computer, including a flow-chart diagram in the patent specification. The flow-chart diagram should be sufficiently detailed to show elements of the algorithm. Ideally, these elements are specific computer steps that must be performed by the algorithm. When such steps are implemented in software programmed in a general-purpose computer, the general-purpose computer becomes a new computer and should satisfy the machine prong of the machine-or-transformation test. Again, care must be made to ensure that the machine-implemented steps are central to the invention, that is to say, not merely field of use limitations or extra-solution activity

How to Draft Efficiently

With the *Phillips* decision and its progeny, the court has established a framework for claim construction in which the specification is always consulted to determine the meaning of claim terms. To prevent claims from being unduly limited, the practitioner must describe the invention using open-ended statements, be diligent in avoiding statements that may be interpreted as prosecution disclaimer, describe the invention in terms of examples, and avoid describing only a single exemplary embodiment. A few simple rules may be employed to limit specification disclaimer: 1) do not use Objects of the Invention; 2) avoid "patent profanity:" words such as "must," "requires," "need" and "essential" 3) Do not characterize the invention. The summary of the invention should paraphrase the broadest claim; any advantages should be described equivocally and attributed narrowly to the embodiments, not broadly to the invention (e.g. "this embodiment *may be* more cost effective as it uses fewer components"). The patent application should not contain any statements such as "the invention is" or even "this element is not a part of the invention." 4) avoid identifying any embodiment as the "preferred" embodiment.

The specification may also be used to broaden the invention by describing as many alternative embodiments as possible, within the budget for the application. Each of these embodiments must be described in sufficient detail so that an ordinarily skilled person in the art can make and use the embodiment without undue experimentation, In a particular embodiment, alternatives for any element should also be listed. If possible, each alternative embodiment and each alternative element should be described as having a separate advantage or reason for being used to prevent the different embodiments or elements from being interpreted as equivalents.

In terms of the typical steps for preparing a patent application, the practitioner should draft at least the independent claims and major dependent claims in order to focus the application and set out any claim terms that need to be defined. Next, the drawing figures should be prepared from the claims. Desirably, for each independent claim, all of the elements should be found in only one drawing figure. The drawing figures, however, may include elements in addition to the claimed elements. The practitioner should then outline a story for describing the invention. The story may describe data or signals flowing through the system from initial conditions to a final result. As described above, the story should cover only examples and each example should be described in terms of the advantages that it may have. After outlining the application, draft the background. The background is desirably as short as possible and should not mention any prior art references or even the problem solved by the invention. Next, draft the detailed description, following the outline and then fill out the claims.

---

[i]Cole v. Kimberly-Clark Corp. 102 F.3d 524, 531, 41 USPQ2d 1001, 1006 (Fed. Cir. 1996) ("Merely because a named element of a patent claim is followed by the word 'means,' however, does not automatically make that element a 'means-plus function' element under 35 U.S.C. §112, ¶6 (citation omitted) . . . . The converse is also true; merely because an element does *not* include the word 'means' does not automatically prevent that element from being construed as a means-plus-function element (cites omitted). We decide on an element-by-element basis, based on the patent and its prosecution history whether §112, ¶ 6 applies." (emphasis in original). *See also* Wenger Mfg., Inc. v. Coating Mach. Sys., Inc., 239 F.3d 1225, 1232, 57 USPQ2d 1679, 1684 (Fed. Cir. 2001).

[ii]"The USPTO must apply 35 U.S.C. 112, para. 6 in appropriate cases, and give claims their broadest reasonable interpretation, in light of and consistent with the written description of the invention in the application. Thus, a claim limitation will be interpreted to invoke 35 U.S.C. §112, para. 6 if it meets the following 3-prong analysis: (1) the claim limitation must use the phrase 'means for' or 'step for'; (2) the 'means for' or 'step for' must be modified by functional language; and (3) the phrase 'means for' or 'step for' must not be modified by sufficient structure, material or acts for achieving the specified function." MPEP §2181, Identifying a 35 U.S.C. 112, Sixth Paragraph Limitation.

[iii]*In re* Vaeck, 947 F.2d 488, 495, 20 USPQ2d 1438, 1444 (Fed. Cir. 1991).

[iv]For a discussion of the person of ordinary skill in the art, *see* 73 J. PAT. & TRADEMARK OFF. SOC'Y 37 (1991).

[v] *In re Fisher*, 427 F.2 833, 839, 166 USPQ 18, 24 (CCPA 1970).

[vi] 550 U.S. -----, 127 S. Ct. 1727, 1742 (2007).
[vii]858 F.2d 731, 8 USPQ2d 1400 (Fed. Cir. 1988).

[viii]*Id.* at 737 (citing *Ex parte* Forman, 230 USPQ 546, 547 (Pat. Off. Bd. App. & Inter., 1986). *See also* Musco Corp. v. Qualite Inc. 41 USPQ2d 1954, 1955 (Fed. Cir. 1997) (unpublished) "Although some experimentation on the part of the artisan is not fatal, *Northern Telecom, Inc. v. Datapoint Corp.,* 908 F.2d 931, 941, 15 USPQ2d 1321, 1329 (Fed. Cir. 1990) (the patent document need not be a product specification), either the experimentation must be routine, or the specification must give 'a reasonable amount of guidance with respect to the direction in which the experimentation should proceed to enable the determination of how to practice a desired embodiment of the invention claimed' *PPG Indus., Inc. v. Guardian Indus. Corp.* 75 F.3d 1558, 1564, 37 USPQ2d 1618, 1623 (Fed. Cir. 1996)."]

[ix]Cases that have addressed this issue for computer-related inventions include *In re* Sherwood, 613 F.2d 809, 816–17, 204 USPQ 537, 544 (C.C.P.A. 1980), *cert. denied*, 450 U.S. 994, 210 USPQ 776 (1981) ("In general, writing a computer program may be a task requiring the most sublime of the inventive faculty or it may require only the droning use of a clerical skill. The difference between the two extremes lies in the creation of mathematical methodology to bridge the gap between the information one starts with (the

'input') and the information that is desired (the 'output'). If these bridge-gapping tools are disclosed, there would seem to be no cogent reason to require the disclosure of the menial tools known to all who practice this art"); White Consol. Indus. v. Vega Servo-Control, Inc., 713 F.2d 788, 791, 218 USPQ 961, 963 (Fed. Cir. 1983) ("[A] skilled programmer in the [numerical control] field testified in this case that development of a single pass language translator would require from 1–1/2 to 2 man years of effort, a clearly unreasonable requirement."); Northern Telecom Inc. v. Datapoint Corp., 908 F.2d 931, 943, 15 USPQ2d 1321, 1330 (Fed. Cir. 1990) ("The great weight of the expert testimony on both sides was that a programmer of reasonable skill could write a satisfactory program with ordinary effort. This requires the conclusion that the programs here involved were, to a skilled programmer, routine.").

[x] 448 F.3d 1357, 79 USPQ2d 1001 (Fed. Cir. 2006)
[xi] *Id*. at 1365, 79 USPQ2d 1006.
[xii] *Ormco Corp. v. Align Tech. Inc*. 498 F.3d 1307 (Fed. Cir. 2007)
[xiii] 107 F.3d 1543, 41 USPQ2d 1801 (Fed. Cir. 1997).
[xiv] *Id.* at 1549.
[xv] 289 F.3d 1367, 62 USPQ2d 1917 (Fed. Cir. 2002).
[xvi] *Id.* at 1380, 62 USPQ2d at 1925.
[xvii] *Id*. at 1381 n.10.
[xviii] 427 F.3d 1361, 77 USPQ2d 1041 (Fed. Cir. 2005)
[xix] *Id*. at 1374, 77 USPQ2d at 1051
[xx] *Id*., 77 USPQ2d at 1052
[xxi] *Id.* Note that lengthy appendixes can no longer be submitted on microfiche.

[xxii] 37 C.F.R. §§ 1.96 and 1.52(e).

[xxiii] For considerations in patenting software inventions before the European Patent Office, *see* Computer-Implemented Inventions and Patents, Law and Practice at the European Patent Office, found at the EUROPEAN PATENT OFFICE Web site, <http://www.european-patent-office.org/epo/pubs/brochure/cii/>.

[xxiv] *See* MPEP §2164.06 (c), Examples of Enablement Issues - Computer Programming Cases .
[xxv] *Id.*
[xxvi] *Id.*
[xxvii] *Id.* (citation omitted)
[xxviii] 421 F.3d 1365, 76 USPQ2d 1225 (Fed. Cir. 2005)
[xxix] *Id.* at 1378, 1235
[xxx] 992 F.2d 1197, 1200-01 26 USPQ2d 1600, 1603 (Fed. Cir. 1993)
[xxxi] 421 F.3d at 1378, 76 USPQ2d at 1235
[xxxii] 82 USPQ2d 1113 (Fed. Cir. 2007)
[xxxiii] 424 F.3d 1336, 76 USPQ2d 1724 (Fed. Cir. 2005)
[xxxiv] 06-1156, -1157 at 4, 82 USPQ2d at 1115.
[xxxv] *Id.* at 8, 82 USPQ2d at 1116
[xxxvi] *Id.*
[xxxvii] *Id.* at 18, 82 USPQ2d at 1118.
[xxxviii] *Id.* at 33, 82 USPQ2d at 1122.
[xxxix] 501 F.3d 1274 (Fed. Cir. 2007).
[xl] *Id.*at 1281.
[xli] 108 F.3d 1361, 1366 (Fed. Cir. 1997)
[xlii] 501 F.3d at 1285.
[xliii] 516 F.3d 993 (Fed. Cir. 2008).
[xliv] *Id.*at 1000.
[xlv] *Id.*at 1002-03
[xlvi] *See* K. Adamo, *What's Better, What's Best: The Best Mode Requirement in US Patent Practice*, 73 J. PAT. & TRADEMARK OFF. SOC'Y 811 (1991).

[xlvii] *In re* Hayes Microcomputer Prods. Inc., 982 F.2d 1527, 1536, 25 USPQ2d 1241, 1248 (Fed. Cir. 1992). *See also* Eli Lilly & Co. v. Barr Labs. Inc. 222 F.3d 973, 55 USPQ2d 1609, 1614 (Fed. Cir. 2000), *vacated,*

251 F.3d 955, 58 USPQ2d 1869 (Fed. Cir. 2001).

[xlviii] See Go Medical Industries Pty., Ltd v. Inmed Corp. 471 F.3d 1264, 1270, 80 USPQ2d 1629, 1633 (Fed. Cir. 2006)
[xlix] *Id.* at 1271, 80 USPQ2d at 1634.
[l] *See In re* Sherwood, 613 F.2d 809, 816, 204 USPQ 537, 544 (C.C.P.A. 1980) ("[T]here is no objective standard by which to judge the adequacy of a best mode disclosure. Instead only evidence of concealment (accidental or intentional) is to be considered. That evidence, in order to result in affirmance of a best mode rejection, must tend to show that the *quality* of an applicant's best mode disclosure is so poor as to effectively result in concealment."), *cert. denied*, 450 U.S. 994, 210 USPQ 776 (1981).

[li] Chemcast Corp. v. Arco Indus. Corp., 913 F.2d 923, 927, 16 USPQ2d 1033, 1036 (Fed. Cir. 1990).

[lii] Fonar Corp. v. General Elec. Co., 107 F.3d 1543, 1549, 41 USPQ2d 1801, 1805 (Fed. Cir. 1997) ("As a general rule, where software constitutes part of a best mode of carrying out an invention, description of such a best mode is satisfied by a disclosure of the functions of the software. This is because, normally, writing code for such software is within the skill of the art, not requiring undue experimentation, once its functions have been disclosed . . . . Thus, flowcharts or source code listings are not a requirement for adequately disclosing the functions of software.").

[liii] Randomex v. Scopus Corp., 849 F.2d 585, 589, 7 USPQ2d 1050, 1054 (Fed. Cir. 1988).

[liv] Northern Telecom Ltd. v. Samsung Elec. Co., 215 F.3d 1281, 1288, 55 USPQ2d 1065, 1070 (Fed. Cir. 2000) (citing Dana Corp. v. IPC L.P., 860 F.2d 415, 418, 8 USPQ2d 1692, 1695 (Fed. Cir. 1988), *and* Northern Telecom, Inc. v. Datapoint Corp., 908 F.2d 931, 940–41, 15 USPQ2d 1321, 1328 (Fed. Cir. 1990)). See also *Allvoice Computing PLC v. Nuance Communications, Inc*. 504 F.3d 1236, 1246 (Fed Cir. 2007) ("Because the claims represent 'the subject matter which the applicant regards as his invention,' subject matter outside the scope of the claims also falls outside the scope of the best mode requirement.")
[lv] Robotic Vision Sys. Inc. v. View Eng'g, Inc., 112 F.3d 1163, 1166, 42 USPQ2d 1619, 1622 (Fed. Cir. 1997) ("Moreover, the fact that the use of software or a computer is not mentioned in the claims of the Robotic patent does not, contrary to Robotic's argument, exempt such use from the requirement of a best mode disclosure, since carrying out the invention usually involves more than what is expressly claimed.").
[lvi] 299 F.3d 1313, 63 USPQ2d 1374 (Fed. Cir. 2002).
[lvii] *Id.* at 1332, 63 USPQ2d at 1385.
[lviii] MPEP §706.03(c)
[lix] Markman v. Westview Instruments, 52 F.3d 967, 970, 34 USPQ2d 1321, 1322 (Fed. Cir. 1995) (en banc), *aff'd*, 517 U.S. 370, 38 USPQ2d 1461 (1996).
[lx] 935 F.2d 1555, 1562, 19 USPQ2d 1111, 1117 (Fed. Cir. 1991).
[lxi] MPEP §2163, Guidelines for the Examination of Patent Applications Under the 35 U.S.C. § 112, para. 1 "Written Description" Requirement (citation omitted).
[lxii] 560 F.3d 1366 (Fed. Cir. 2009)
[lxiii] *Id.* at 1380
[lxiv] 424 F.3d 1336, 76 USPQ2d 1724 (Fed. Cir. 2005)
[lxv] *Id.* at 1346, 76 USPQ2d at 1732 (emphasis added, cites omitted)
[lxvi] 935 F.2d 1555, 19 USPQ2d 1111 (Fed. Cir. 1991) (quoting *In re* Gosteli, 872 F.2d 1008, 10 USPQ2d 1614 (Fed. Cir. 1989)); Ralston Purina Co. v. Far-Mar-Co., 772 F.2d 1570, 227 USPQ 177 (Fed. Cir. 1985); *In re* Kaslow, 707 F.2d 1366, 217 USPQ 1089 (Fed. Cir. 1983).

[lxvii] 935 F.2d at 1563, 19 USPQ 2d at 1116 (quoting *In re* Gosteli, 872 F.2d 1008, 10 USPQ2d 1614 (Fed. Cir. 1989)); Ralston Purina Co. v. Far-Mar-Co., 772 F.2d 1570, 227 USPQ 177 (Fed. Cir. 1985). *But see* Hyatt v. Boone, 146 F.3d 1348, 1353, 47 USPQ2d 1128, 1132 (Fed. Cir. 1998) ("This finding comports with the criterion not only of whether the description conveyed to the artisan the specific subject matter of the count, but also of whether the applicant established that this was the necessary construction of that description. The written description must include the limitations of the count with sufficient clarity and specificity that 'persons of ordinary skill in the art will recognize from the disclosure that appellants invented processes including those limitations,' *In re Wertheim*, 541 F.2d 257, 262, 191 USPQ 90, 96 (CCPA 1976).").

[lxviii]MPEP §2163.
[lxix]*Vas-Cath Inc.,* 935 F.2d at 1565, 19 USPQ2d at 1118. But see *Hockerson-Halberstadt v. Avia Group International, Inc.* 222 F3d 951 at 956, 55 USPQ2d 1487 at 1491 (Fed. Cir. 2000), "patent drawings do not define the precise proportions of elements and may not be relied upon to show particular sizes if the specification is completely silent on the issue."

[lxx] Fec. Cir. 2008-1267, -1376
[lxxi] *Id.* at 10
[lxxii] 558 F.3d 1368 (Fed. Cir. 2009)
[lxxiii] Id at 1379
[lxxiv]16 F.3d 1189, 29 USPQ2d 1845 (Fed. Cir. 1994).

[lxxv]MPEP §2181.

[lxxvi] *See, e.g.* Diagnostics Corp. v. Elekta AB 344 F.3d 1205 at 1211, 68 U.S.P.Q.2d 1263 at 1268 (Fed. Cir. 2003).
[lxxvii] 490 F.3d 946 (Fed Cir. 2007)
[lxxviii] *Id.*at 949
[lxxix] *Id.*at 950
[lxxx] *Id.*at 953
[lxxxi] Fed. Cir. 2007-1375 at 8
[lxxxii] 184 F.3d 1339 (Fed. Cir. 1999)
[lxxxiii] Fed. Cir. 2007-1375 at 11.
[lxxxiv] *Id.*
[lxxxv]504 F.3d 1236 (Fed. Cir. 2007
[lxxxvi] *Id* at 1242. (citation omitted).
[lxxxvii] *501 F. 3d at 1284*
[lxxxviii] *Net Moneyin, Inc. v. Verisign,* Inc. 545 F.3d 1359,1367 (Fed. Cir. 2008) "Consequently, a means-plus-function claim element for which the only disclosed structure is a general purpose computer is invalid if the specification fails to disclose an algorithm for performing the claimed function."
[lxxxix] 435 F.3d 1366, 77 USPQ2d 1625 (Fed. Cir. 2006)
[xc] See *Id.* at 1370, 77 USPQ2d at 1628, quoting Bancorp Servs., L.L.C. v Hartford Life Ins. Co. 359 F.3d 1367, 69 USPQ2d 1999 (Fed. Cir. 2004).
[xci] *Id.* at 1371, 77 USPQ2d at 1629.
[xcii] *Id.* at 1370, 77 USPQ2d at 1628 (citation omitted).
[xciii] 89 U.S.P.Q.2D (BNA) 1207 (Bd. Pat. App & Int. 2008)
[xciv] 504 F.3d 1236.at 1240 (citation omitted).
[xcv] *Id.*at 1245 (citation omitted).
[xcvi] 514 F.3d 1244 (Fed. Cir. 2008).
[xcvii] *Id.*at 1249-50
[xcviii] *Id.*at 1251.
[xcix]230 F.3d 1320, 56 USPQ2d 1481 (Fed. Cir. 2000).
[c]*Id.* at 1327, 56 USPQ2d at 1487.
[ci]264 F.3d 1111, 60 USPQ2d 1017 (Fed. Cir. 2001).
[cii]*Id.* at 1119, 60 USPQ2d at 1024.
[ciii]325 F.3d 1306, 66 USPQ2d 1429 (Fed. Cir. 2003).
[civ]*Id.* at 1327, 66 USPQ2d at 1443 (Rader, J., concurring).
[cv]*E.g.*, Aro Mfg. Co. v. Convertible Top Replacement Co., 365 U.S. 336, 345, 1961 Dec. Comm'r Pat. 635, 128 USPQ 354 (1961).
[cvi]Markman v. Westview Instruments, Inc., 52 F.3d 967, 980, 34 USPQ2d 1321, 1329–30 (Fed. Cir. 1995) (quoting Seymour v. Osborne, 78 U.S. (11 Wall.) 516, 546 (1871)).
[cvii]*Id.* at 980, 34 USPQ2d at 1330.
[cviii]78 F.3d 1575, 1577, 38 USPQ2d 1126, 1128 (Fed. Cir. 1996).
[cix]*Id.* at 1579, 38 USPQ2d at 1129.
[cx]*Id*.
[cxi]*Id.* at 1579, 38 USPQ2d at 1129–30.

[cxii] *Id.* at 1579, 38 USPQ2d at 1130.
[cxiii] *Id.*
[cxiv] 90 F.3d 1576, 39 USPQ2d 1573 (Fed. Cir. 1996).
[cxv] *Id.* at 1584, 39 USPQ2d at 1578.
[cxvi] *Id.* at 1582, 39 USPQ2d at 1576. See also Honeywell Int'l, Inc. v. Universal Avionics Sys. Corp. 493 F.3d 1358, 1361-62 (Fed. Cir. 2007) ("When a patentee defines a claim term, the patentee's definition governs, even if it is contrary to the conventional meaning of the term. A claim term may be defined in a particular manner for purposes of a patent even 'without an explicit statement of redefinition.'") (Cites omitted).
[cxvii] *Id.* at 1582, 39 USPQ2d at 1577.
[cxviii] *Id.*
[cxix] *Id.* at 1582, 39 USPQ2d at 1578.
[cxx] *Id.* at 1583, 39 USPQ2d at 1579.
[cxxi] *Id.* (emphasis in original).
[cxxii] *Id.*
[cxxiii] 358 F.3d 1371, 69 USPQ2d 1857 (Fed. Cir. 2004). See also *Elster Electricity LLC, v Schlumberger Res. Mgmt. Servs, Inc.* 107 Fed. Appx. 914 (Fed. Cir. 2004) (Unpublished). In this case a claim element directed to a "controller connected to said switching member and to a third winding of said transformer, for generating said control signal in response to the output of said power supply" was interpreted as requiring that the third winding be responsive to the second winding as the second winding was described earlier in the claim as defining "the output of said power supply." Because the written description and drawings explicitly stated that the second winding was insulated to prevent interference between the second and third windings, the court found this claim was not enabled by the specification.
[cxxiv] Phillips v. AWH Corp., 415 F.3d 1303, 1327, 75 USPQ2d 1321, 1336 (Fed. Cir. 2005).
[cxxv] 493 F.3d 1358 (Fed. Cir. 2007)
[cxxvi] *Id.* at 1361
[cxxvii] *Id*. at 1368. See also *Lucent Tech. Inc. v. Gateway, Inc.* 525 F.3d 1200at 1215 (Fed. Cir. 2008) This court has repeatedly held that courts may not redraft claims to cure a drafting error made by the patentee, whether to make them operable or to sustain their validity. … While it is true that we may construe claims to sustain their validity when the claims are amenable to more than one reasonable construction; when the claims are susceptible to only one reasonable construction, we will construe the claims as the patentee drafted them. (cites omitted).
[cxxviii] 413 F.3d. 1361, 75 USPQ2d 1385 (Fed. Cir. 2005)
[cxxix] *Id*. at 1368-69, 75 USPQ2d at 1389 (cites omitted)
[cxxx] 438 F.3d 1374, 77 USPQ2d 1988 (Fed. Cir. 2006)
[cxxxi] *Id*. at 1380, 77 USPQ2d at 1993.
[cxxxii] I*d*. at 1381, 77 USPQ2d at 1994.
[cxxxiii] 134 F.3d 1473, 45 USPQ2d 1498 (Fed. Cir. 1998).
[cxxxiv] *Id.* at 1477, 45 USPQ2d at 1501.
[cxxxv] 175 F.3d 985, 50 USPQ2d 1607 (Fed. Cir. 1999).
[cxxxvi] *Id.* at 989, 50 USPQ2d at 1610.
[cxxxvii] *Id.* at 993, 50 USPQ2d at 1612.
[cxxxviii] *Id.* at 994, 50 USPQ2d at 1613.
[cxxxix] 197 F.3d 1377, 53 USPQ2d 1161 (Fed. Cir. 1999).
[cxl] *Id.* at 1382, 53 USPQ2d at 1164.
[cxli] *Id.* at 1382, 53 USPQ2d at 1165.
[cxlii] 93 F.3d 766, 770, 772, 39 USPQ2d 1801, 1803, 1805–06 (Fed. Cir. 1996).
[cxliii] 197 F.3d at 1382, 53 USPQ2d at 1165.
[cxliv] *Id.*
[cxlv] 214 F.3d 1342, 54 USPQ2d 1915 (Fed. Cir. 2000).
[cxlvi] *Id.* at 1345, 54 USPQ2d at 1917.
[cxlvii] *Id.*
[cxlviii] *Id.* at 1346, 54 USPQ2d at 1918.
[cxlix] *Id.* (Newman, J., concurring).
[cl] *Id.* at 1347, 54 USPQ2d at 1918 (Newman, J., concurring).

[cli] *Purdue Pharma L.P. v. Faulding Inc.,* 230 F.3d 1320, 56 USPQ2d 1481 (Fed. Cir. 2000).
[clii] *Id.* at 1326, 56 USPQ2d at 1486 (citing In re Ruschig, 379 F.2d 990, 54 C.C.P.A. 1551, 154 USPQ 118 (C.C.P.A. 1967)).
[cliii] 230 F.3d at 1327, 56 USPQ2d at 1487.
[cliv] 242 F.3d 1337, 58 USPQ2d 1059 (Fed. Cir. 2001).
[clv] *Id.* at 1343, 58 USPQ2d at 1064–65 (quoting U.S. Patent Nos. 5,156,594; 5,217,482; and 5,395,334) (emphasis in original).
[clvi] *Id.* at 1341, 58 USPQ2d at 1062–63.
[clvii] Phillips v. AWH Corp., 415 F.3d 1303, 1316, 75 USPQ2d 1321, 1329 (Fed. Cir. 2005) ("[T]he specification may reveal an intentional disclaimer, or disavowal, of claim scope by the inventor. In that instance as well, the inventor has dictated the correct claim scope, and the inventor's intention, as expressed in the specification, is regarded as dispositive.") (citation omitted).
[clviii] 256 F.3d 1323, 59 USPQ2d 1401 (Fed. Cir. 2001).
[clix] *Id.* at 1331–32, 59 USPQ2d at 1407 (citing Comark Communications, Inc. v. Harris Corp., 156 F.3d 1182, 48 USPQ2d 1001, 1005 (Fed. Cir. 1998)).
[clx] *Id.* at 1333, 59 USPQ2d at 1408.
[clxi] *Id.* at 1336, 59 USPQ2d at 1411.
[clxii] 262 F.3d 1258, 59 USPQ2d 1865 (Fed. Cir. 2001).
[clxiii] *Id.* at 1269, 59 USPQ2d at 1871.
[clxiv] *Id.* at 1268, 59 USPQ2d at 1870 (*citing* Johnson Worldwide Assocs., Inc. v. Zebco Corp., 175 F.3d 985, 989, 50 USPQ2d 1607, 1610 (Fed. Cir. 1999)).
[clxv] *Id.* at 1270, 59 USPQ2d at 1872.
[clxvi] *Id.*
[clxvii] *Id.* See also Curtiss-Wright at 7-9 "this chain of reasoning errs because it places too much emphasis on the ordinary meaning of 'adjustable' without adequate grounding of that term within the context of the specification of the '714 patent. … Thus, the specification of the 714 patent consistently, and without exception, describes adjustment that occurs during operation of the de-header system."
[clxviii] 442 F.3d 1331, 78 USPQ2d 1428 (Fed. Cir. 2006)
[clxix] *Id.* at 1339, 78 USPQ2d at 1434
[clxx] *Id.* at 1340, 78 USPQ2d at 1434
[clxxi] Johnson Worldwide Assocs., Inc. v. Zebco Corp., 175 F.3d 985, 50 USPQ2d 1607 (Fed. Cir. 1999).
[clxxii] 274 F.3d 1336, 60 USPQ2d 1851 (Fed. Cir. 2001).
[clxxiii] 415 F.3d 1278 75 USPQ2d 1475 (Fed. Cir. 2005)
[clxxiv] *Id.* at 1287, 75 USPQ2d at 1482.
[clxxv] 288 F.3d 1359, 62 USPQ2d 1658 (Fed. Cir. 2002).
[clxxvi] *Id.* at 1368, 62 USPQ2d at 1664 (citations omitted).
[clxxvii] 308 F.3d 1193, 64 USPQ2d 1812 (Fed. Cir. 2002).
[clxxviii] *Id.* at 1202, 64 USPQ2d at 1818.
[clxxix] *Id.* at 1203, 64 USPQ2d at 1819.
[clxxx] 516 F.3d 1290 (Fed. Cir. 2008)
[clxxxi] *Id.*at
[clxxxii] *Id.*at note 2
[clxxxiii] 318 F.3d 1143, 65 USPQ2d 1818 (Fed. Cir. 2003).
[clxxxiv] *Id.* at 1151, 65 USPQ2d at 1823.
[clxxxv] Gentry Gallery Inc. v. Berkline Corp., 134 F.3d 1473, 45 USPQ2d 1498 (Fed. Cir. 1998).
[clxxxvi] 336 F.3d 1298, 67 USPQ2d 1438 (Fed. Cir. 2003).
[clxxxvii] *Id.* at 1300, 67 USPQ2d at 1443.
[clxxxviii] *Id.* at 1304, 67 USPQ2d at 1443.
[clxxxix] Texas Digital Sys. Inc. v. Telegenix Inc., 308 F.3d 1193, 64 USPQ2d 1812 (Fed. Cir. 2002).
[cxc] *See, e.g.,* Brookhill-Wilk 1 LLC v. Intuitive Surgical Inc. 334 F.3d 1294, 67 USPQ2d 1132 (Fed. Cir. 2003) and On-Line Technology Inc. v. Bodenseewerk Perkin-Elmer GmbH 386 F.3d 1133, 73 U.S.P.Q.2d 1116 (Fed. Cir. 2004).
[cxci] *See, e.g.,* Alloc Inc. v. ITC, 342 F.3d 1361, 68 USPQ2d 1161 (Fed. Cir. 2003) and Bilstad v. Wakalopulos, 368 F.3d 1116, 72 USPQ2d 1785 (Fed. Cir. 2004).
[cxcii] Phillips v. AWH Corp., 415 F.3d 1303, 75 USPQ2d 1321 (Fed. Cir. 2005).

[cxciii] *Id.* at 1318, 75 USPQ2d at 1330 (citation omitted).
[cxciv] *Id.* at 1319, 75 USPQ2d at 1321 (citation omitted).
[cxcv] *Id.* at 1321, 75 USPQ2d at 1332.
[cxcvi] *Id.* at 1324, 75 USPQ2d at 1335 (citation omitted).
[cxcvii] *Id.* at 1315, 75 USPQ2d at 1327 (citation omitted).
[cxcviii] Alloc Inc. v. ITC, 342 F.3d 1361, 68 USPQ2d 1161 (Fed. Cir. 2003).
[cxcix] *Id.* at 1370, 68 USPQ2d at 1167.
[cc] *Id.* at 1376, 68 USPQ2d at 1173 (Schall, J., dissenting).
[cci] SciMed Life Sys. v. Advanced Cardiovascular Sys., 242 F.3d 1337, 58 USPQ2d 1059 (Fed. Cir. 2001).
[ccii] 424 F.3d 1136, 76 USPQ2d 1481, (Fed. Cir. 2005).
[cciii] *Id*. at 1145, 76 USPQ2d at 1487.
[cciv] *Id*. at 1142, 76 USPQ2d at 1486 (citation omitted).
[ccv] *Id*. at 1145, 76 USPQ2d at 1488.
[ccvi] *Id*. at 1145-46, 76 USPQ2d at 1488.
[ccvii] 453 F.3d 1364, 79 USPQ2d 1443 (Fed. Cir. 2006)
[ccviii] *Id.* at 1374, 79 USPQ2d at 1450.
[ccix] *Id.* at 1375, 79 USPQ2d at 1451 (citation omitted).
[ccx] 435 F.3d 1381, 77 USPQ2d 1788 (Fed. Cir. 2006).
[ccxi] *Id*. at 1384, 77 USPQ2d at 1789.
[ccxii] 525 F.3d 1327 (Fed. Cir. 20098)
[ccxiii] *Id* at 1330.
[ccxiv] *Id* at 1333.
[ccxv] 462 F.3d 1344, 80 USPQ2d 1225 (Fed. Cir. 2006)
[ccxvi] *Id*. at 1349, 80 USPQ2d at 1228.
[ccxvii] *Id.* at 1353, 80 USPQ2d at 1231.
[ccxviii] 527 F.3d 1379 (Fed. Cir. 2008)
[ccxix] Id at. 1382
[ccxx] 440 F.3d 1354 (Fed. Cir. 2006)
[ccxxi] *Id*. at 1356, 78 USPQ2d 1254.
[ccxxii] *Id*.
[ccxxiii] *Id*. at 1357, USPQ2d at 1254.
[ccxxiv] 444 F.3d 1337, 78 USPQ2d 1438 (Fed. Cir. 2006).
[ccxxv] *Id*. at 1347, 78 USPQ2d at 1445
[ccxxvi] *Id*, 78 USPQ2d at 1446.
[ccxxvii] 436 F.3d 1317, 77 USPQ2d 1481 (Fed. Cir. 2006).
[ccxxviii] *Id.* at 1321, 77 USPQ2d at 1484.
[ccxxix] *Id.* at 1322, 77 USPQ2d at 1485.
[ccxxx] 474 F.3d 1361, 81 USPQ2d 1545 (Fed. Cir. 2007).
[ccxxxi] *Id*. at 1367, 81 USPQ2d at 1550.
[ccxxxii] *Id.* at 1370, 81 USPQ2d at 1552.
[ccxxxiii] *Id.* at 1371
[ccxxxiv] 473 F.3d 1173, 81 USPQ2d 1314 (Fed. Cir. 2006)
[ccxxxv] *Id.* at 1182, 81 USPQ2d at 1320
[ccxxxvi] 498 F.3d 1316
[ccxxxvii] 450 F.3d 1350, 78 USPQ2d 1786 (Fed. Cir. 2006)
[ccxxxviii] *Id.* at 1354, 78 USPQ2d at 1788.
[ccxxxix] *Id.* at 1356, 78 USPQ2d at 1790.
[ccxl] *Id.* at 1358, 78 USPQ2d at 1791.
[ccxli] 474 F.3d 1323, 81 USPQ2d 1661 (Fed. Cir. 2007)
[ccxlii] *Id.* at 1330, 81 USPQ2d at 1666.
[ccxliii] *Id.* at 1330-1331
[ccxliv] 479 F.3d 1313, 81 USPQ2d 1900 (Fed. Cir. 2007)
[ccxlv] *Id.* at 1316, 81 USPQ2d at 1903.
[ccxlvi] *Id.* at 1317
[ccxlvii] *Id.* at 1318, 81 USPQ2d at 1904 (citation omitted)

[ccxlviii] 424 F. 3d at 1344, 76 USPQ2d at 1731.
[ccxlix] *Id*. at 1345, 76 USPQ 2d at 1732.
[ccl] *Id*.
[ccli] *Id*. at 1346, 76 USPQ2d at 1732 (cites omitted).
[cclii] 558 F.3d at 1379.
[ccliii] 415 F3d at 1318 75 USPQ 2d at 1330
[ccliv] 418 F.3d 1349, 76 USPQ 2d 1078 (Fed. Cir. 2005)
[cclv] *Id.* at 1354, 76 USPQ 2d at 1082
[cclvi] *Id.* at 1357, 76 USPQ 2d at 1084
[cclvii] *Id.* at 1359, 76 USPQ 2d at 1085
[cclviii] KSR International Co. v. Teleflex, Inc. No. 04-1350 (550 U.S. ____) (2007) 82 USPQ2d 1385.
[cclix] Id. at 23.
[cclx] *Id.* at 22.
[cclxi] *Id.* at 14.
[cclxii]"[A] patentable invention may lie in the discovery of the source of a problem even though the remedy may be obvious once the source of the problem is identified. This is part of the 'subject matter as a whole' which should always be considered in determining the obviousness of an invention under 35 U.S.C. §103." *In re Sponnoble*, 405 F.2d 578, 585, 160 USPQ 237, 243 (CCPA 1969) also see MPEP §2141.02 (III)

[cclxiii] See e.g. *In re O'Farrell*, 853 F.2d 894, 903, 7 USPQ2d 1673, 1681 (Fed. Cir. 1988)
[cclxiv] 04-1350 at 17
[cclxv] *Id.* at 23
[cclxvi] 545 F.3d 943, 88 U.S.P.Q.2d 1385 (Fed. Cir. 2008)
[cclxvii] 417 F.2d 1395 (C.C.P.A. 1969)
[cclxviii] *Id*. at 1401 "To find that the claimed process could be done mentally would require us to hold that a human mind is a digital computer or its equivalent, and that a draftsman is a planar plotting apparatus or its equivalent. On the facts of this case we are unwilling to so hold."
[cclxix] *Id.* at 1400
[cclxx] Fed Cir. 2007-1130 at 24.
[cclxxi] 32 F.3d 1579 (Fed. Cir. 1994).
[cclxxii] *Id.* at 1584.