PREPARING AND PROSECUTING ELECTRONIC AND COMPUTER RELATED PATENT APPLICATIONS: AVOIDING AND OVERCOMING STATUTORY SUBJECT MATTER REJECTIONS

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I. Introduction

One of the more controversial and confusing areas of patent law today centers around the issue of what constitutes statutory subject matter under 35 U.S.C. § 101. This is especially true of electronic and computer program related inventions.

The scope of statutory subject matter is codified by 35 U.S.C. § 101, which states that the right to obtain a patent is given to one who "invents or discovers any new and useful process, machine, manufacture, or composition of matter or any new and useful improvement thereof." The broad and somewhat vague wording of the statute renders the legal definition of statutory subject matter open for interpretation. This is especially true in the electronic and computer areas, where a clear consensus has not been reached among the courts, the U.S. Patent and Trademark Office (USPTO), and patent attorneys with regard to the scope of statutory subject matter for computer-program related inventions.

*298 Although patent claims directed towards computer program-related inventions are controversial, the patent community continues to file thousands of patent applications directed towards this technology every year. For example, in class 364 (pertaining to electrical computers and processing systems) of the Manual of Classification published by the U.S. Department of Commerce (Patent and Trademark Office), and recently created class 395 (pertaining to information processing system organization), the number of filings has steadily increased each of the last five years. [n1]

The USPTO's interpretation of § 101 is clear. In accordance with an official policy developed by the USPTO, the USPTO asserts non-statutory subject matter rejections under 35 U.S.C. § 101 against virtually all claims having a mathematical algorithmic or computer software flavor. [n2] The problem with the USPTO's reasoning is that: (1) this rejection can be applied against practically all electronic and computer inventions since most electronic and computer inventions can be expressed in terms of mathematical

algorithms, and/or can be implemented in software; and (2) these inventions encompass subject matter which otherwise would and should qualify as viable inventions (subject matter) under § 101. The Constitutional patent mandate is to promote the progress of useful arts by granting a limited term of protection to inventions, and electronic and computer inventions are encompassed by this mandate. [n3]

The U.S. is the world leader in software [n4] technological areas. It is also making a comeback in many other areas of electronic and computer technology. Thus, the practice by the USPTO of categorically rejecting many electronic and computer inventions under § 101 is hurting U.S. industry and harming its current competitive edge. The long-term consequences of the current USPTO policy will be to permit the copying of U.S. technology by foreign competitors, reduce R & D expenditures, and reduce high-level U.S. jobs.

*299 This article [n5] is designed to aid patent attorneys in preparing electronic and computer program-related patent applications in view of the current legal environment surrounding this technology and 35 U.S.C. § 101, and in responding to § 101 rejections issued by the USPTO against such applications. Section II of this article addresses an overview of the development and the current status of the law with regard to the statutory subject matter nature of mathematical algorithm and computer software-related inventions. Section III provides suggestions for preparing applications directed to mathematical algorithm and computer software-related inventions. A suggested methodology for prosecuting such patent applications with the USPTO is supplied in Section IV, and concluding remarks are provided in Section V.

II. Brief Survey of the Development and the Current Status of the Law [n6]

35 U.S.C. § 101 defines statutory subject matter as follows:
   Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title. [n7]

Section 100(b) of Title 35 defines "process" to mean:
   process, art or method, and includes a new use of a known process, machine, manufacture, composition of matter, or material. [n8]

In Gottschalk v. Benson [n9], the first of the modern Supreme Court cases dealing with the patentability of computer-related subject matter, the Court reiterated the definition of a patentable process first set forth in Cochrane v. Deener: [n10]
   *300 That a process may be patentable irrespective of the particular form of the instrumentalities used, cannot be disputed. *** A process is a mode of treatment of certain materials to produce a given result. It is an act, or a series of acts, performed upon the subject matter to be transformed and reduced to a different state or thing. [n11]

In Benson, the Court emphasized that:

Transformation and reduction of an article "to a different state or thing" is the clue to the patentability of a process claim that does not include particular machines. [n12]

The most recent Supreme Court case dealing with the patentability of computer-related technology is Diamond v. Diehr. [n13] In Diehr, the Court indicated that "Congress intended statutory subject matter [under 35 USC § 101] to 'include anything under the sun that is made by man.' S.Rep. No. 1979, 82d Cong., 2d Sess., 5 (1952), H.R.Rep. No. 1923, 82d Cong., Sec.2d Sess., 6 (1952)." [n14] The Court also recognized that not every discovery is embraced within the terms of the statute. "Excluded from such patent protection are laws of nature, physical phenomena and abstract ideas." [n15]

In Diehr, the Court affirmed that Gottschalk v. Benson and Parker v. Flook, [n16] "both of which were computer-related" stood for the same "long established principles." [n17] The Court also confirmed that the definition of "algorithm" used in all three cases is:
  a procedure for solving a given type of mathematical problem ... [and that] such an algorithm, or mathematical formula, is like a law of nature, which cannot be the subject of a patent. [n18]

The Diehr Court laid out the basic principles of the test for determining patentability of a computer-related process that includes or appears to include an algorithm.
  *301 [W]hen a claim recites a mathematical formula (or scientific principle or phenomenon of nature), an inquiry must be made into whether the claim is seeking patent protection for that formula in the abstract. A mathematical formula as such is not accorded the protection of our patent laws [citation omitted], and this principle cannot be circumvented by attempting to limit the use of the formula to a particular environment. [[Citation omitted.] Similarly, insignificant post-solution activity will not transform an unpatentable principle into a patentable process. *** On the other hand, when a claim containing a mathematical formula in a structure or process which, when considered as a whole, is performing a function which the patent laws were designed to protect (e.g., transforming or reducing an article to a different state or thing), then the claim satisfies the requirements of § 101. [n19]

See also footnote 14 in Diehr, to wit:
  A mathematical formula does not suddenly become patentable subject matter simply by having the applicant acquiesce to limiting the reach of the patent for the formula to a particular technological use. A mathematical formula in the abstract is nonstatutory subject matter regardless of whether the patent is intended to cover all uses of the formula or only limited uses. Similarly, a mathematical formula does not become patentable subject matter merely by including in the claim for the formula token post-solution activity...." [n20]

But the Court also noted that
  a claim drawn to subject matter otherwise statutory does not become nonstatutory simply because it uses a mathematical formula, computer program, or digital computer. [n21]

The Court stressed the importance of considering the claim as a whole in determining whether the claimed process is eligible for patent protection under Section 101.

It is inappropriate to dissect the claims into old and new elements and then to ignore the presence of the old elements in the analysis. This is particularly true in a process claim because a new combination of steps in a process may be patentable even though all the constituents or the combination were well known and in common use before the combination was made. The "novelty" of any element or steps in a process, or even of the process itself, is of no relevance in determining whether the subject matter of a claim falls within the § 101 categories of possibly patentable subject matter. [n22]

Subsequent to Diehr, the CCPA decided a number of computer-related cases. Among the most important post-Diehr cases were the trilogy of In re Taner, [n23] In re Pardo, [n24] and In re Abele. [n25] Taner was decided first, *302 followed by Pardo and Abele, both decided on the same day. In Pardo and Abele, the CCPA expressly adopted the pre-Diehr two-part test for "analyzing mathematical algorithm-statutory subject matter cases." That test, the so-called Freeman-Walter test, [n26] was expressed in Pardo as follows:

First, the claim is analyzed to determine whether a mathematical algorithm is directly or indirectly recited. Next, if a mathematical algorithm is found, the claim as a whole is further analyzed to determine whether the algorithm is "applied in any manner to physical elements or process steps," and, if it is, it "passes muster under § 101." [n27]

It is important to note that the Court in Pardo emphatically pointed out that:

Indeed, any process, machine, manufacturer [sic], or composition of matter constitutes statutory subject matter unless it falls within a judicially determined exception to section 101. [n28]

In Taner, the CCPA distinguished between claims that are directed to "merely presenting and solving a mathematical algorithm" [n29] (which are not statutory subject matter), and claims that are drawn "to a process of converting one physical thing into another physical thing" [n30] (which are statutory subject matter). Taner's claims were directed to a method of seismic exploration which simulated the response of subsurface earth formations to cylindrical or plane waves. An algorithm was directly recited in the claims. The Court held that the claimed process involved taking one kind of "signal" and converting it into another kind of signal. "Thus the claims set forth a process and are statutory within § 101." [n31]

The CCPA also took issue with the Board of Appeals' position that "there is nothing necessarily physical about 'signals' " and that "the *303 end product [of Taner's invention] is a mathematical result in the form of a pure number." [n32] The Court stated that

[The Board's] characterization is contrary to the views expressed by this court in In re Sherwood, 613 F.2d 809, 204 USPQ 537 (CCPA 1980), and In re Johnson, 589 F.2d 1070, 200 USPQ 199 (CCPA 1978), where signals were viewed as physical and the processes were viewed as transforming them to a different state.

*** In both cases, this court found that, though appellants' claims recited a mathematical algorithm for manipulating ... data, the claims were, as a whole, drawn not to a method of solving that algorithm but to a process of converting one physical thing into another physical thing, and in Sherwood expressly recognized that "seismic traces are *** [sic] physical apparitions." 613 F.2d at 819, 204 USPQ at 546. That those "physical apparitions" may be expressed in mathematical terms is in our view irrelevant. [n33]

   In Abele, the CCPA explained the Walter modification to the Freeman test as follows:
   Walter should be read as requiring no more than that the algorithm be "applied in any manner to physical elements or process steps," provided that its application is circumscribed by more than a field of use limitation or non-essential post-solution activity. Thus, if the claim would be "otherwise statutory" [citation omitted], albeit inoperative or less useful without the algorithm, the claim likewise presents statutory subject matter when the algorithm is included. This broad reading of Walter, we conclude, is in accord with the Supreme Court decisions. [n34]

   Since the Taner, Pardo, and Abele decisions, the CCPA and its successor, the Court of Appeals for the Federal Circuit, have decided several computer-related cases. In re Meyer, [n35] the last of the CCPA cases, the Court upheld the Board's affirmance of the Examiner's rejection of the Meyer claims under 35 USC § 101. The Meyer claims were directed to a method of storing and correlating test responses on a complex system. Applying the first part of the two-part Freeman-Walter test to the Meyer claims, the court relied on the applicants' specification and arguments to find that the invention "is concerned with replacing, in part, the thinking processes of a neurologist with a computer." [n36] The court then concluded that a mathematical algorithm was involved in the claims.

   As to the second part of the test, the court noted that Walter had modified Freeman to require a "positive approach"; that is, the inquiry should be into whether the algorithm is implemented in a specific *304 manner to define steps in process claims. [n37] The court further noted that Walter was "not intended to be an exclusive test"; rather, a "more comprehensive test" is to be found in Abele. [n38] The decisive question thus becomes "whether [the] mental process is applied to physical elements or process steps in an otherwise statutory process, machine, manufacture, or composition of matter." [n39] Applying this analysis to the Meyer claims, the court found that the algorithm of the applicants' claims had not been applied to physical elements or process steps and were not to an otherwise statutory process or apparatus. [n40] The court did not limit the claims with reference to the specification.

   In re Grams [n41] also upheld a rejection of claims as being directed to non-statutory subject matter. In its analysis, the Federal Circuit noted that "intuitively," the applicants' diagnostic method constituted a "process," even without the first, data gathering step. [n42] The court viewed Grams' claim 1 as combining a physical step (data gathering) with an algorithm ("producing," "comparing," "successively testing ... and comparing," and "identifying") by which the data was analyzed to ascertain an abnormality. The court

noted that "[i]t is of no moment that the algorithm is not expressed in terms of a mathematical formula. Words used in a claim operating on data to solve a problem can serve the same purpose as a formula." [n43]

The court recognized the difficulty of determining when a claim that combines an algorithm with physical steps satisfies the test of statutory subject matter. The Freeman-Walter test is not an exclusive one. "[T]hough satisfaction of the Walter test necessarily depicts statutory subject matter, failure to meet that test does not necessarily doom the claim." [n44] Referring to In re Abele, the court noted that the "otherwise statutory" language used in that decision did not establish a separate test. "We read ... [Abele] consistently ... with Walter, as requiring (to *305 meet the Walter test) not only that the physical steps in the claim (without the algorithm) constitute a statutory process but, also, that the algorithm operates on a claimed physical step." [n45] Finally, at bottom, the question that must always be asked is: "What did the applicants invent?" [n46] That determination is not based "solely on the words appearing in the claims" but on a "careful interpretation of each claim in light of its supporting disclosure." [n47] Alternatively, the inquiry may be phrased as: whether the claim in essence covers only the algorithm. [n48]

The court distinguished Grams' claims from those found statutory in Abele. In Abele, "the production and detection steps were not viewed as merely antecedent steps to obtain values to solve the algorithm...." Instead, "the algorithm served to improve the CAT-scan process." [n49] With Grams' claims,

because algorithm steps do not operate to change any aspect of the physical process of [the data gathering] step, the claim does not satisfy the Walter guideline. Though this by itself is not dispositive ... patentability here is precluded by the fact that [the] physical step [of gathering data] merely provides data for the algorithm. [n50]

Concurrently with In re Grams, the Federal Circuit decided In re Iwahashi. [n51] There the sole claim at issue was an apparatus claim, couched substantially in "means plus function" language (except for the claimed "read only memory"). The court found that the claim at least indirectly recited a mathematical algorithm, and thus met the first part of the Freeman-Walter test. [n52] However, the court found the claim to be statutory under the second part of the test, relying on the following statement in Walter:

"Once a mathematical algorithm has been found, the claim as a whole must be further analyzed. If it appears that the mathematical algorithm is implemented in a specific manner to define structural relationships between physical elements of the claim (in apparatus claims) or to refine or limit claim steps (in process claims), the claim being otherwise statutory; the claim passes muster under § 101." [n53]

*306 Subsequently, the USPTO Board of Appeals decided Ex parte Logan. [n54] There the Board reversed the Examiner's rejections under, inter alia, 35 U.S.C. § 101. The appealedclaims included both apparatus and method claims. Apparatus claim 1 was couched in "means plus function" format. [n55]

At the outset, the Board quoted In re Gelnovatch [n56] for the proposition that the mere "fact that the claimed process is performed on a computer is not a proper basis for [a §

101] [sic] rejection." [n57] Moreover, the Board stated that "there is no reason for testing a computer differently from any other apparatus employed to perform a recited process step." [n58] Therefore, as to the question of whether claims are directed to statutory or nonstatutory subject matter, the Board concluded that "it is immaterial whether the claimed process is disclosed as implemented by a programmed computer or by hardware." [n59]

The Board in Logan employed the following statement of the Freeman-Walter test as set forth in In re Meyer, [n60]:

In considering a claim for compliance with 35 USC 101, it must be determined whether a scientific principle, law of nature, idea, or mental process, which may be represented by a mathematical algorithm, is included in the subject matter of the claim. If it is, it must then be determined whether such principle, law, idea, or mental process is applied in an invention of the type set forth in 35 USC 101. This is consistent with [Freeman] as modified by [Walter], and the more recent decisions by this court in [Pardo] and [Abele]. [n61]

With respect to the first part of the test, the Board analyzed what is meant by a "mathematical algorithm." The Board referred to Gelnovatch for guidance as to what constitutes a nonstatutory algorithm or method of calculation:

Although the line separating statutory processes from nonstatutory processes is unclear, the mere presence of a calculation or the computer implementation of the method does not mandate a holding that the claimed procedure is not a "process" within the meaning of 35 USC 101. But, where ... the *307 claims solely recite a method whereby a set of numbers is computed from a different set of numbers by merely performing a series of mathematical computations, the claims do not set forth a statutory process. [n62]

The Board then concluded that

the essence of a method of calculation in the § 101 sense, whether it is in the form of mathematical formula or equation or some other form, is the computation of one or more numbers from a different set of numbers by performing a series of mathematical computations.

*** [W]e believe a claim should be considered as reciting a mathematical algorithm only if it essentially recites, directly or indirectly, a method of computing one or more numbers from a different set of numbers by performing a series of mathematical computations. Consequently, a claim which essentially recites another type of method does not recite a mathematical algorithm, even though it incidentally requires, either directly or indirectly, the performance of some mathematical computations. In our view, this approach correctly places the emphasis on what the claimed method steps do rather than how the steps are performed. [n63]

The latest Federal Circuit decision dealing with the patentability of computer-related technology is Arrhythmia Research Technology, Inc. v. Corazonix Corp. [n64] Arrhythmia was an appeal from a grant of summary judgment of invalidity of the '459 patent for failure to claim statutory subject matter under 35 U.S.C. § 101. The '459 patent was directed to the analysis of electrocardiographic signals in order to determine

certain characteristics of the heart function. For convenience, claim 1 of the '459 patent, the broadest method claim, is reproduced below:

1. A method for analyzing electrocardiograph signals to determine the presence or absence of a predetermined level of high frequency energy in the late QRS signal, comprising the steps of:

converting a series of QRS signals to time segments, each segment having a digital value equivalent to the analog value of said signals at said time;

applying a portion of said time segments in reverse time order to high pass filter means;

determining an arithmetic value of the amplitude of the output of said filter; and

comparing said value with said predetermined level. [n65]

After a thorough analysis of Supreme Court, CCPA and prior Federal Circuit decisions, the Court concluded that

The law crystallized about the principle that claims directed solely to an abstract mathematical formula or equation, including the mathematical expression of scientific truth or a law of nature, whether directly or indirectly *308 Stated, are nonstatutory under section 101; whereas claims to a specific process or apparatus that is implemented in accordance with a mathematical algorithm will generally satisfy section 101.

In applying this principle to an invention whose process steps or apparatus elements are described at least in part in terms of mathematical procedures, the mathematical procedures are considered in the context of the claimed invention as a whole. [n66]

The following section provides guidelines that will aid the patent attorney in drafting patent applications given this legal environment.

III. Drafting Patent Applications in View of the Legal Environment Surrounding 35 U.S.C. § 101

It is our experience that the USPTO is making two types of § 101 rejections. The first deals with software per se, and the second deals with computer program-related inventions which use a mathematical algorithm. By originally drafting the claims with the question "What did the applicant invent?" in mind, the probability of receiving a statutory subject matter rejection can be decreased.

A. Drafting The Claimed Invention To Be Read "As A Whole"

In any computer program-related invention in which the process steps or apparatus elements are described at least in part in terms of mathematical algorithms, the USPTO must consider the claim "as a whole" as outlined in Diehr. [n67] As such, we recommend drafting the preamble and the body of the claims with functional language that enables a Patent Examiner to understand the claimed invention "as a whole." In other words, the patent attorney should ensure that the claims are drafted in a manner that allows the Examiner to understand at a high level (e.g. a generalized level) "what the invention is."

However, we remind the reader that a claim directed to non- statutory subject matter cannot be saved by recitation of a "field of use limitations," "insignificant post solution activity" or mere "data gathering." The above concepts must also be carried to the specification.

It is important to draft the specification for computer program-related inventions with statutory subject matter inmind. The patent attorney must incorporate as much hardware as possible into the description of the invention. Even if the entire invention is performed in software, a high level illustration of the computer platform on which the software operates should be described and illustrated in the patent application.

*309 It is always easier to argue that the claims as a whole satisfy the requirements of § 101 if the specification describes the invention from a high level. Oftentimes, the invention is described at a low, specific level. This practice can be fatal to a patent application, because the patent attorney finds it difficult to claim the invention in anything other than mathematical steps. By explaining any transformations that might take place (whether it be the transformation of signals or other physical elements) or explaining how the mathematical algorithm is applied in any manner to physical elements or process steps, the patent attorney can avoid only claiming the mathematical aspects of the invention.

B. Specific Claim Language Essential to Claim Drafting

It is essential that the computer program-related method be described and claimed within the context of a computer environment. It is therefore recommended that the words "computer-based" be inserted before the word "method" in method claims. We also recommend inserting the words "computer- based" before the words "system" and "apparatus" in apparatus and system claims, respectively. Although it might seem obvious that all systems and apparatus meet the requirements of § 101, this is not the case, at least as interpreted by the USPTO. This is especially the case when the system or apparatus claims are written in means plus function format.

C. Types of Claims To Be Used in Claim Drafting

If at all possible, the patent attorney should have system and/or apparatus claims in the computer program-related application. It is also recommended that two sets of system and/or apparatus claims be drafted. The first set should use the means plus function form under 35 U.S.C. § 112, 6. [n68] The second set should use specific architecture and/or hardware components. For example, in In re Iwahashi a claim reciting a ROM was held to be statutory since the ROM was considered to be "a specific piece of apparatus," such that the claim did not wholly preempt the use of the algorithm recited in the claim. [n69]

It is also recommended that the patent attorney include in the specification any possible hardware components that could be *310 substituted for the computer program-related

modules. This recommendation applies even if the patent attorney does not plan on claiming the specific hardware. Once again, any recitation of hardware in the specification, and especially in the claims, aids the patent attorney during prosecution. Once claims are rejected under § 101, the patent attorney cannot add hardware elements that are not specifically discussed in the specification.

IV. Prosecuting Patent Applications Directed To Mathematical Algorithm and Computer Software-Related Inventions

As discussed above, statutory subject matter rejections are frequently issued by the USPTO against mathematical algorithm and computer software-related claims. [n70] Thus, patent attorneys should expect to receive statutory subject matter rejections against mathematical and computer software-related claims, even when the above application drafting recommendations are followed. However, by following the above recommendations, the patent attorney is in a stronger position to respond to such statutory subject matter rejections.

In this section, a suggested methodology for responding to statutory subject matter rejections under 35 U.S.C. § 101 is presented.

A. Identifying Whether the Rejection is a Form or Customized Rejection

A first step in our suggested methodology for overcoming § 101 rejections is to identify whether the rejection is a form or a customized rejection. A form rejection typically includes broad generalized statements regarding § 101 and the surrounding case law. It does not apply the law to the individual claims. Rather, it makes bald assertions that the claims in general are directed towards non-statutory subject matter. In most instances, the Examiner uses a form rejection when he wants to reject the claims under § 101 because they are allegedly directed to a computer program or "software" intended to run on a computer.

A customized rejection contains more specific recitations of the case law as it applies to § 101 and the claims at issue. These rejections usually reject each claim individually for a specific reason. Mathematical algorithms rejections are typically customized rejections. The Examiner will cite the two part Freeman-Walter-Abele [n71] test and apply it to the *311 claims. If necessary, the Examiner will cite cases to support the propositions that "field of use limitations" and "data gathering" are insufficient to change a non- statutory claim into a statutory one. The next step in our suggested methodology for overcoming § 101 rejections is to prepare a response to the rejection.

B. Responding To § 101 Rejections

The strategy for preparing the response depends on whether the rejection is directed to a mathematical algorithm-related invention or a computer software- related invention. Accordingly, these two bases of rejection are considered separately in the following sections.

1. Responding To § 101 (Mathematical Algorithm) Rejections

As discussed in Section IV.A., mathematical algorithm rejections are ordinarily claim specific. Therefore, it is difficult to provide a generalized methodology for responding to such rejections. However, the strategies and techniques which we have successfully employed in responding to mathematical algorithm rejections share some common characteristics. Provided below are generic suggestions for responding to mathematical algorithm rejections which address these characteristics. [n72]

The typical (mathematical algorithm) rejection is as follows:
The basis of this rejection is set forth in the two-step test given by In re Freeman, 197 USPQ 464 (CCPA 1978), as modified by In re Walter, 205 USPQ 397 (CCPA 1980), and In re Abele, 214 USPQ 682 (CCPA 1982). The first part of the Freeman-Walter-Abele test is to determine whether an algorithm is either directly or indirectly claimed. Once the first part of the Freeman-Walter-Abele test is met, the claims, taken as a whole, must be analyzed to determine whether or not the claims preempt a mathematical algorithm. Under the second test, as modified by Abele, the claims are considered without the algorithm to determine whether the remainder is "otherwise statutory."

If necessary, the rejection also states:
"Field of use" or "end use" limitations have been held to be insufficient to constitute a statutory method or process. The courts have also held that the steps for providing data necessary for the proper operation of the algorithm cannot make a claim statutory. Further, without the incorporation of significant post-solution activity, claims cannot pass muster under 35 U.S.C. § 101.

In responding to statutory subject matter rejections, we recommend citing liberally from Arrhythmia Research Technology, Inc. v. Corazonix *312 Corp. [n73] The Arrhythmia Court did not ignore the preamble of the claims at issue, and neither should the drafting attorney or the Patent Examiner. [n74] The preamble is a good place to emphasize "what the claimed method steps do rather than how the steps are performed." [n75]

The Arrhythmia court also stated that "the view that there is nothing necessarily physical about 'signals' is incorrect." [n76] Many, if not all, computer-program related inventions can be claimed in terms of "signals" as computers operate according to signals. In fact, anything that is being manipulated or transformed can typically be drafted in terms of "signals." By converting numerical inputs and outputs that appear in the claims into signals, the mathematical algorithm rejection can oftentimes be overcome. [n77]

If the purpose of the computer-program related invention is to transform or reduce an article to a different state or thing, the claim must be drafted accordingly. [n78] Inventions that perform physical steps on physical elements cannot preempt the mathematical algorithm and, as such, pass muster under § 101. The Arrhythmia court (citing Abele) stated that no more is required "than that the algorithm be 'applied in any manner to physical elements or process steps,' provided that its application is circumscribed by more than a field of use limitation or non-essential post-solution activity." [n79] Significant (or essential) post-*313 solution activity will render statutory a claim reciting a mathematical algorithm, either directly or indirectly. Arguing that a certain activity is significant can oftentimes aid the patent attorney in overcoming mathematical algorithm rejections. [n80]

2. Responding To § 101 (Computer Software) Rejections

In responding to a § 101 (computer software) rejection, it is first necessary to identify the Examiner's rationale for issuing the rejection. Then, a response to the rejection is prepared in accordance with such identification (i.e, the response is tailored to the particular rationale used by the Examiner). These steps for responding to § 101 (computer software) rejections are discussed in the following two sections.

a. Identifying the Rationale Underlying the § 101 (Computer Software) Rejection
The USPTO employs a number of rationales to reject computer software claims under § 101. The rationale used most frequently by the USPTO is that computer software is non-statutory since it does not fall within any of the statutory classes of § 101 (i.e., process, machine, manufacture, or composition of matter). The USPTO routinely issues this rejection even when the claim preamble explicitly directs the claim to one of the statutory classes (i.e., "A process of ***" or "A machine for ***"). The reason given by the USPTO usually goes something like this:
    Applicant has attempted to categorize the invention in the preamble as an apparatus [or system, method, etc.]. However, it is clear that the body of the claim is directed to computer "code" since no computer is claimed. Non- statutory subject matter cannot be automatically converted into statutory subject matter by broadly labeling the claim as an "apparatus", since this form of draftsmanship would amount to elevating form over substance.

Another common rationale used by the USPTO is that computer software is non-statutory since it merely constitutes printed matter. "Printed matter" according to a line of older CCPA decisions is not statutory. In the context of this rationale, it appears that the USPTO is equating a "print-out" of a computer program with the computer program itself. This rejection is typically issued against method claims, rather than apparatus claims, and is usually phrased as follows:
    *314 Computer code or software, like printed matter, has no distinct structure itself but is only representative of a type of information; by analogy to printed matter, such

abstractions from physical method steps or apparatus are not deemed to be patentable subject matter.

A rationale which the USPTO is using more frequently is that computer software is non-statutory since it merely constitutes mental steps. [n81] The language of this rejection usually takes the following form:

The claims recite various steps or actions all of which are believed to be capable of being performed in a human brain, thus falling under the "mental steps" exception of 35 U.S.C. § 101.

The USPTO is also couching software non-statutory subject matter rejections in terms of 35 U.S.C. § § 103 and 112, first paragraph (enablement). [n82] Section 103 rejections are being issued against "computer program product" claims, which claim software stored on a floppy disk (or other computer readable medium). [n83] In these § 103 rejections, the USPTO typically contends that the claims are unpatentable as obvious in view of the well-known data processing technique of storing software on storage media. Usually, the rejection does not address any of the novel or unobvious features of the claimed software.

Section 112, first paragraph, rejections are often issued against computer-related apparatus claims which are written in means plus function language, and which do not positively recite a computer. In these rejections, the Examiner essentially interprets the means plus function elements as only reading on a computer program. The Examiner then objects to the specification under 35 U.S.C. § 112, first paragraph, as not being enabling since the specification does not disclose "how a mere program, without more, can carry out the functions recited in the means plus function language." Then, the Examiner rejects the claims under 35 U.S.C. § 112, first paragraph, for the same reasons set forth in the objection.

Usually, the USPTO relies upon more than one of the above bases to reject software-related claims on non-statutory subject matter grounds. One should not be surprised to see all of the above bases in any particular *315 Office Action. Of course, these rejections are in addition to any prior art rejections issued by the Patent Examiner.

b. Tailoring the Response to the Rationale Used by the Examiner

In responding to § 101 (non-statutory subject matter) rejections of computer software claims, the threshold question is whether to traverse or accommodate the rejection. In answering this question, we recommend that the patent attorney look to whether the rejection is a form rejection or a customized rejection. [n84]

We recommend taking a firm stance when responding to form rejections. The patent attorney should explain to the Examiner that the broad brush rejection must discuss the claims individually and with particularity. When the Examiner makes a major technical rejection (e.g., non-statutory subject matter), the rejection should be stated with full development of the reasons for rejection rather than by a mere conclusion coupled with

some generic expression. [n85] Each claim should be considered separately, and a clear reason for rejecting each claim should be given. The rejections are rarely based on established law, but rather based on conjecture on the part of the USPTO.

  Customized rejections require more care and consideration by the Examiner than a form rejection. Nevertheless, they can also be overcome, as outlined below. We first consider traversing § 101 rejections.

  In traversing a rejection of computer software claims, we recommend attacking the USPTO's underlying premise of the rejection: computer software is per se non-statutory. In point of fact, there has been no decision of the Supreme Court, CCPA, Federal Circuit, or the Board of Patent Appeals and Interferences (including its predecessor) which has specifically held that computer software constitutes non-statutory subject matter per se. The USPTO's position that computer software is per se non-statutory is simply one interpretation of existing case law. [n86]

  We recommend traversing § 101 rejections of computer software claims by asserting that no court has clearly held that computer software is per se non- statutory. This assertion should be accompanied by a thorough and well-reasoned discussion of the law. This discussion should advocate the position that computer software is per se statutory subject *316 matter. Considering the holdings in such cases as Arrhythmia, such an interpretation is at least as reasonable as the USPTO's contrary interpretation. Then, we recommend requesting that the Examiner withdraw the rejection, or identify any cases explicitly and unambiguously holding that computer software is per se non- statutory.

  The suggestions in the preceding two paragraphs address traversing those § 101 rejections which allege that the claims do not recite subject matter which fall within one of the statutory classes. Recall that the USPTO also uses two other rationales under § 101--printed matter and mental steps. Traversing rejections which employ these two rationales are discussed below.

  The printed matter rejection is premised on the allegation that "computer software, like printed matter, has no distinct structure itself but is only representative of a type of information". While printed matter is not statutory, it is well settled that the processes, machines, compositions of matter, etc., described by the printed matter are eligible for patent protection. Similarly, a print-out of a computer program may not constitute statutory subject matter under the printed matter rejection. However, the processes and functions which comprise the computer program should constitute statutory subject matter. Accordingly, the USPTO's contention that computer software-related processes and functions do not have "distinct structure," but are "only representative of a type of information" is flawed. The processes and functions which comprise computer software have as much structure as other non- computer program related processes, such processes being statutory as explicitly codified in 35 U.S.C. § 101. We recommend traversing printed matter rejections in accordance with the above statements.

The mental steps rejection is based on the allegation that "the claims recite various steps or actions all of which are believed to be capable of being performed in a human brain." [n87] Often, computers and the programs which control the computers find value in relieving humans of repetitive tasks. When the tasks are simple, the mental steps rejection may be appropriate. When the tasks are complex or involve interaction with devices which do not have a "human friendly" interface (for example, direct electrical interaction with an electrical diagnostic device), the mental steps rejection may not be, and probably is not, appropriate. The mental steps rejection is one which must be considered on a per claim basis. When the rejection is not appropriate, then it can *317 be traversed in the conventional manner by discussing the ways in which the claimed subject matter cannot be performed in a human brain.

The traversal strategies presented above have been successful in a number of cases. Often, the strategy is most effective if first presented to the Examiner in an in-person interview. However, given the current posture of the USPTO, it is prudent not to rely on any one strategy. Accordingly, we recommend adding claims or amending at least some of the pending claims to accommodate the rejection, even if you intend to traverse the rejection. Filing continuation applications works well in these instances (it passes to issue the accommodated claims and provides an independent basis for traversal). Accommodating § 101 rejections of computer software claims is discussed below.

Often, § 101 rejections of computer software claims can be easily accommodated without unduly limiting the scope of the claims. Frequently, the rejection will even suggest the type of claim amendment which would be sufficient to overcome the rejection.

For example, § 101 rejections of method claims (alleging that the claims do not recite subject matter falling within one of the statutory classes) often include the following statement: "The claims are not directed to a computer implemented process, i.e., to a series of steps performed by a computer, which processes were held by the CCPA to constitute statutory subject matter unless within a judicially determined exception to 101." Such § 101 rejections can often be successfully accommodated by amending the claim to explicitly recite a computer implemented method comprising steps which are executed in a data processing apparatus. This type of amendment is also frequently successful in overcoming § 101 printed matter rejections, since it makes clear that the claimed subject matter is not "only representative of a type of information." Similarly, this type of amendment is also frequently successful in overcoming § 101 mental steps rejections, since it makes clear that the claimed subject matter is not directed to steps which are performed in a human brain.

The following statement is often used by the USPTO to justify § 101 rejections of apparatus claims: "It is clear that the body of the claim is directed to computer code since no computer is claimed." Such § 101 rejections can often be successfully accommodated by amending the claim to positively recite a data processing apparatus or, simply, a computer (and to amend the claim elements to "operate in said computer"). While

certainly limiting, this claim amendment may be acceptable if the invention truly includes some type of data processing apparatus.

Often, accommodating § 101 computer software rejections may be as simple as that described above. In issuing the rejection, the Examiner *318 may simply be trying to build a prosecution file record. [n88] In such cases, the simple claim amendments suggested above will usually be sufficient to overcome the rejection, since they more clearly place the claims in a statutory category.

It is not always easy to overcome § 101 computer software rejections. In such cases, more substantial claim amendments are necessary to overcome the rejection. Such amendments could include tying the claimed subject matter to a particular physical arrangement and/or particular physical components. Other amendments could include reciting the claimed subject matter in terms of transforming physical entities (such as electrical signals in a computer) from one state to other states.

It has been our experience that it is very difficult to accommodate § 103 rejections of computer program product claims while still maintaining the claims in the computer program product format. In light of the current posture of the USPTO, we recommend canceling any computer program product claim unless your client is prepared to appeal from an adverse decision of the Examiner to the Board of Patent Appeals and Interferences. Similarly, if your client is willing to go to the Board, then for efficiency and timeliness purposes we recommend appealing at the earliest possible opportunity, i.e., after the claims have been twice rejected and any § 112 rejections have been overcome.

Successful accommodation of objections and rejections based on § 112, first and second paragraphs, usually follow directly from the successful accommodation of the underlying § 101 statutory subject matter rejection. For example, if in accommodating the § 101 rejection you have amended the claims such that they recite a computer implemented method or a computer system, then you have simultaneously accommodated the § 112 objections and rejections since the claims no longer allegedly read solely on a computer program.

*319 C. Conducting an Examiner Interview

With regard to § 101 rejections, the interview can be an invaluable tool in prosecuting your clients' patent applications. [n89] It is frequently difficult to assess from the Office Action itself what specifically troubles the Examiner with regard to § 101. As discussed above, the Examiner is oftentimes giving the § 101 rejection to comply with internal USPTO policy. In this situation, the rejection can typically be overcome by a simple argument or an amendment to the claims. On the other hand, this type of rejection sometimes cannot be overcome regardless of the concessions made by the applicant. The interview helps gauge the Examiner's position, so that the patent attorney can draft an appropriate response.

We believe that an in-person interview is more effective than a telephone interview with the Examiner. To begin with, demonstrations are impossible if a telephone interview is conducted. It is our experience that a physical demonstration (if possible) can aid the patent attorney in overcoming § 101 rejection. The demonstration makes the invention come alive to the Examiner, and helps demonstrate the fact that the invention is not a mathematical "algorithm." If possible, bring a portable computer to the interview with the software already loaded. Test the program ahead of time so that you become thoroughly familiar with it, and its limitations. Furthermore, as in any negotiation, in-person contact with the opposing side is critical in conveying your thoughts and feelings, and it is more difficult for the Examiner to sidestep the issues. Also, in an in-person interview, the patent attorney can better prevent an atmosphere of animosity from arising.

The key to a successful interview is preparation. The patent attorney must be prepared to negotiate and discuss his position, and not expect the Examiner to explain how the case can be allowed. The patent attorney must have different arguments and possible claim amendments to present to the Examiner. Although this advice applies to all interviews, it is especially true in interviews involving § 101. Unless the patent attorney is prepared to appeal the Examiner's decision to the Board of Patent Appeals and Interferences, he must be prepared to reach *320 a compromise. In order to be ready to make compromises that are in the best interest of their client, the patent attorney must be prepared for the interview.

Finally, the patent attorney should regularly prepare proposed claim sets for the interview. If one of the proposed claim sets is accepted by the Examiner during the interview, it can be attached to the interview summary record. It is not recommended, however, to have all the discussed claims sets attached to the interview summary record, as this might create unnecessary prosecution history estoppel.

D. Appealing From an Adverse Decision of the Examiner

We recommend taking all possible and reasonable steps to reach agreement with the Examiner on the nature and scope of the allowable subject matter. However, if after taking such steps the Examiner's decision remains adverse to your client's position, then an appeal to the Board of Patent Appeals and Interferences may be necessary.

Before appealing any case, the practitioner should develop a strong set of claims to rely on in the appeal process. This should be performed by incorporating structural language into the claims wherever possible and amending the preamble of the claim to point out the substance of the invention. This will help support the argument that the invention performs a useful "inventive" function, rather than an attempt to hide a pure mathematical algorithm by the attorney through clever draftsmanship.

V. Conclusion

The United States leads the world in computer program-related inventions. [n90] Such technology has been, and will continue to be, the driving force for productivity enhancement in the electronics industry. Extreme care needs to be taken to protect the sizable lead the U.S. has achieved in terms of innovation and the associated investment of time and money directed towards computer program-related technology. It would be undesirable to see the U.S. patent system be the mechanism that results in the deterioration of the U.S. electronics industry.

At present, the USPTO's interpretation of the case law surrounding 35 U.S.C. § 101 is providing the patent attorney with a hostile environment in which to prosecute computer program related inventions. [n91] *321 However, it is important to realize that § 101 rejections can be avoided, and can be overcome when issued by the USPTO. A patent attorney must to properly manage the application preparation and prosecution process and fully understand the invention. The process begins with the question: "What is the invention?" It ends with a claim that defines the invention in a manner that circumscribes only the means or steps that occur within an electronic device--a computer. As long as the invention is something under the sun that is made by man, it then becomes a matter of properly drafting the claims to cover only that which is made by man. [n92]

The fact that an invention is implemented in hardware or software should be of no moment. The real issue is whether the otherwise properly claimed invention is novel and unobvious. As long as the claims are directed to a computer implemented invention, that should be the only issue.

[n1] For example, in 1988 there were approximately 4,000 patent applications filed in these classes, while in 1992, over 7,500 patent applications were filed.

[n2] See infra note 88.

[n3] U.S. Const. art. 1, § 1, cl. 8.

[n4] The term "software" is used in this paper. However, due to the current posture of the PTO relating to these type of inventions, many experts recommend not using this term in patent applications. Instead, they recommend using the term "computer program related invention" or technology.

[n5] This article is based on the authors' study of the law, experience in writing computer related patent applications (collectively over 200), experience in prosecuting such applications and in particular, responding to Office Actions containing § 101 rejections and discussions with Patent Examiners of the USPTO in Groups 2300 and 2600.

[n6] This section is not intended to provide an analysis or an exhaustive treatment of patent law surrounding statutory subject matter. Rather, it provides the reader with a summary of case law that will aid the patent attorney and have immediate applicability in day-to-day practice.

[n7] 35 U.S.C. § 101 (1988).

[n8] 35 U.S.C. § 100(b) (1988).

[n9] 409 U.S. 63, 175 U.S.P.Q. 673 (1972).

[n10] 94 U.S. 780 (1876).

[n11] Benson, 409 U.S. at 69-70, 175 U.S.P.Q. at 676 (quoting Cochrane, 94 US at 787).

[n12] Benson, 409 U.S. at 70, 175 U.S.P.Q. at 676.

[n13] 450 U.S. 175, 209 U.S.P.Q. 1 (1981).

[n14] Id. at 182, 209 U.S.P.Q. at 6.

[n15] Id. at 185, 209 U.S.P.Q. at 7 (citing Parker v. Flook, 437 U.S. 584, 198 U.S.P.Q. 193 (1978); Gottschalk v. Benson, 409 U.S. 63, 67, 175 U.S.P.Q. 673, 674-75 (1973); and Funk Bros. Seed Co. v. Kalo Co., 333 U.S. 127, 130, 76 U.S.P.Q. 280, 281 (1948)).

[n16] 437 U.S. 584, 198 U.S.P.Q. 193 (1978).

[n17] 450 U.S. at 185, 209 U.S.P.Q. at 7-8.

[n18] Id. at 186, 209 U.S.P.Q. at 8. The Court expressly declined to adopt the broader definition of "algorithm" propounded by the PTO. See Diamond v. Diehr, 450 U.S. at 187 n. 9, 209 U.S.P.Q. at 8 n. 9.

[n19] 450 U.S. at 191-92, 209 U.S.P.Q. at 10 (emphasis added).

[n20] Id. at 192 n. 14.

[n21] Id. at 187, 209 U.S.P.Q. at 8.

[n22] Id. at 188-89, 209 U.S.P.Q. at 9.

[n23] 681 F.2d 787, 214 U.S.P.Q. 678 (CCPA 1982).

[n24] 684 F.2d 912, 214 U.S.P.Q. 673 (CCPA 1982).

[n25] 684 F.2d 902, 214 U.S.P.Q. 682 (CCPA 1982).

[n26] The "Freeman-Walter" test was first enunciated by the CCPA in In re Freeman, 573 F.2d 1237, 197 U.S.P.Q. 464 (CCPA 1978) and subsequently modified by In re Walter, 618 F.2d 758, 205 U.S.P.Q. 397 (CCPA 1980). This test was adopted and has been consistently applied by the CCPA and its successor court to analyze the mathematical algorithm-statutory subject matter problem under § 101.

[n27] 684 F.2d at 915, 214 U.S.P.Q. at 675-76 (quoting Walter, 618 F.2d at 767, 205 U.S.P.Q. at 407).

[n28] Id. at 916, 214 U.S.P.Q. at 677 (emphasis in original) (citing In re Gelnovatch, 595 F.2d 32, 38, 201 U.S.P.Q. 136, 142 (CCPA 1979); In re Sarkar, 588 F.2d 1330, 1333, 200 U.S.P.Q. 132, 137 (CCPA 1978)).

[n29] 681 F.2d at 790, 214 U.S.P.Q. at 681.

[n30] Id.

[n31] Id. (emphasis in original).

[n32] Id.

[n33] Id. (emphasis added).

[n34] 684 F.2d at 907, 214 U.S.P.Q. at 686.

[n35] 688 F.2d 789, 215 U.S.P.Q. 193 (CCPA 1982).

[n36] Id. at 795, 215 U.S.P.Q. at 198.

[n37] Id. at 796, 215 U.S.P.Q. at 198.

[n38] Id.

[n39] Id. at 795, 215 U.S.P.Q. at 198.

[n40] Id. at 796, 215 U.S.P.Q. at 199.

[n41] 888 F.2d 835, 12 U.S.P.Q.2d 1824 (Fed.Cir.1989).

[n42] Id. at 837, 12 U.S.P.Q.2d at 1826.

[n43] Id. at 837 n. 1, 12 U.S.P.Q.2d at 1826 n. 1.

[n44] Id. at 839, 12 U.S.P.Q.2d at 1827.

[n45] Id. at 839 n. 4, 12 U.S.P.Q.2d at 1827 n. 4.

[n46] Id. at 839, 12 U.S.P.Q.2d at 1827.

[n47] Id. at 839, 12 U.S.P.Q.2d at 1827-28 (citing In re Abele, 684 F.2d at 907, 214 U.S.P.Q. at 687).

[n48] Cf. Grams, 888 F.2d at 839, 12 U.S.P.Q.2d at 1828.

[n49] 684 F.2d at 914, 214 U.S.P.Q. at 675.

[n50] 888 F.2d at 840, 12 U.S.P.Q.2d at 1829.

[n51] 888 F.2d 1370, 12 U.S.P.Q.2d 1908 (Fed.Cir.1989).

[n52] Id.

[n53] Id. at 1375, 12 U.S.P.Q.2d at 1911 (emphasis in original) (quoting Walter, 618 F.2d at 767, 205 U.S.P.Q. at 407).

[n54] 20 U.S.P.Q.2d 1465 (B.P.A.I.1991).

[n55] Id.

[n56] 595 F.2d 32, 201 U.S.P.Q. 136 (CCPA 1979).

[n57] Logan, 20 U.S.P.Q.2d at 1466 (quoting Gelnovatch, 595 F.2d at 36-37, 201 U.S.P.Q. at 141).

[n58] Id. (quoting In re Johnson, 589 F.2d 1070, 1081 n. 12, 200 U.S.P.Q. 199, 211 n. 12 (CCPA 1978)).

[n59] Id. at 1467.

[n60] See supra note 33.

[n61] Logan, 20 U.S.P.Q.2d at 1467 (quoting Meyer, 688 F.2d at 795, 215 U.S.P.Q. at 198).

[n62] Id. (quoting Gelnovatch, 595 F.2d at 41-42, 201 U.S.P.Q. at 145).

[n63] Id. at 1467-68 (emphasis in original) (footnotes omitted).

[n64] 958 F.2d 1053, 22 U.S.P.Q.2d 1033 (Fed.Cir.1992).

[n65] Id. at 1055, 22 U.S.P.Q.2d at 1035.

[n66] Id. at 1057, 22 U.S.P.Q.2d at 1037 (emphasis added). See also infra note 79.

[n67] See supra text accompanying notes 13-22.

[n68] See, Ex parte Akamatsu, 22 U.S.P.Q.2d 1915 (B.P.A.I.1992) (holding that means plus function claims that differ from method claims only in "means for" terms before steps must be treated as indistinguishable from method claims in determining whether method is statutory subject matter).

[n69] 888 F.2d at 1375, 12 U.S.P.Q.2d at 1912.

[n70] See supra part II.

[n71] In re Freeman, 197 U.S.P.Q. 464 (CCPA 1978); In re Walter, 205 U.S.P.Q. 397 (CCPA 1980); and In re Abele, 214 U.S.P.Q. 682 (CCPA 1982).

[n72] See, e.g., Stuart P. Meyer, "Obtaining and Enforcing Patents for Software-Related Inventions: Avoiding the Pitfalls", 14th Annual Computer law Institute, PLI, Vol. 2, 1992, which provides additional suggestions for responding to mathematical algorithm rejections.

[n73] 958 F.2d 1053, 22 U.S.P.Q.2d 1033 (Fed.Cir.1992). Currently, the USPTO is deliberately ignoring Arrhythmia. See, e.g., Ex parte Alappat, 23 U.S.P.Q.2d 1340 (B.P.A.I.1992) ("Arrhythmia was an appeal from an infringement action involving a patent, and the rules of claim construction of patent claims are different than rules for claim interpretation during ex parte prosection.")

[n74] The court stated that the preamble is a claim limitation and should "not [be] ignored in determining whether the subject matter as a whole is statutory, for all of the claim steps are an implementation of this method." Arrhythmia, 22 U.S.P.Q.2d at 1038.

[n75] Ex Parte Logan, 20 U.S.P.Q.2d 1465, 1468 (B.P.A.I.1991) (emphasis in original).

[n76] Arrhythmia, 888 F.2d at 1059, 22 U.S.P.Q.2d at 1038 (citing In re Taner, 681 F.2d 787, 790, 214 U.S.P.Q. 678, 681 (CCPA 1982)).

[n77] Although it can usually be argued that signals are inherent to all electronic and computer systems, the patent application should initially be drafted with the term "signal" used throughout in any case that potentially involves mathematical algorithms.

[n78] "When a claim containing a mathematical formula implements or applies that formula in a structure or process which, when considered as a whole, is performing a function which the patent laws were designed to protect (e.g., transforming or reducing an article to a different state or thing), the claim satisfies the requirements of § 101." Diamond v. Diehr, 450 U.S. 175, 190-91, 209 U.S.P.Q. 1, 10 (1981).

[n79] 888 F.2d at 1058, 22 U.S.P.Q.2d at 1037 (quoting Abele, 684 F.2d at 907, 214 U.S.P.Q. at 686).

[n80] See, e.g., Diamond v. Diehr, 450 U.S. 175 (1981) (holding that the opening of a mold was significant post-solution activity); Ex parte Akamatsu, 22 U.S.P.Q.2d 1915 (B.P.A.I.1992) (holding that the displaying of a graphic point on a display device was not significant).

[n81] A method which can be substantially practiced using only a human mind is not statutory--such a method is said to constitute "mental steps".

[n82].

[n83] While it is beyond the scope of this paper, many experts believe that this claim format results in direct infringement by a party who makes software alone that is not bundled with hardware--a very common scenario. The USPTO issued several celebrated patents with this claim format before stopping this practice due to perceived political pressure from some parts of the industry.

[n84] See supra part IV.A.

[n85] See Manual of Patent Examining Procedure (M.P.E.P.) § 706.03.

[n86] Many experts argue that the USPTO's position is an unreasonable interpretation of case law.

[n87] See supra note 81.

[n88] The Director of USPTO Examining Group 2300 has promulgated written instructions that a § 101 rejection should be issued whenever the statutory subject matter nature of a computer software claim is in issue. The Director's instructions state that: "If the claim is the least bit suspect regarding the 101 question--make the rejection. At least the record in the application will be clear that we considered this question. Applicant will probably amend his claims to clearly place them in a statutory category ..." D.C. Toedt, III, "Software Patent Controversies Lead to Different Outcomes in the Federal Circuit, PTO," The Computer Lawyer, Vol. 9, No. 7, p. 18 (1992) (quoting Director Gerald Goldberg).

[n89] The benefits of conducting an Examiner interview have been well documented. See, e.g., Al Lawrence Smith, Negotiating with Patent Examiners, 72 JPTOS 168 (February, 1990). Some of the benefits of the interview are as follows: (a) an interview makes the invention come alive to the Examiner: (b) an interview creates the proper atmosphere for negotiating your position; and (c) building a rapport with the Examiner can aid the patent attorney in not only the patent application at hand, but others in the future.

[n90] See supra note 5.

[n91] It is possible that the Federal Circuit will resolve questions surrounding statutory subject matter under § 101 and means plus function under § 112 in In re Alappat, which was heard in banc in April 1993.

[n92] The concurring opinion by Judge Rader in Arrhythmia should be a guide.

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