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AN ATTEMPT TO RATIONALIZE FLOPPY DISK CLAIMS

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I. INTRODUCTION

It is now more than four years since the Federal Circuit’s en banc decision in *In re Alappat.* It is now at least two years since the intertwined events of the Federal Circuit’s curious decisions to remand in *In re Beauregard* and *In re Trovato,* and the publication by the Patent and Trademark Office (“PTO”) of its *Guidelines* on the examination of software-related patent applications. Despite that passage of time, the clarity of the legal status of software-related patents, and particularly those written in article of manufacture format (so-called floppy disk patents), has not improved.

Nonetheless, use of such claims in patent applications is said to have become pervasive, in the wake of the PTO’s concession to the Federal Circuit in the *Beauregard* case that computer programs embodied in a tangible medium, such as floppy diskettes, are patentable subject matter . . . and must be examined . . . . As a result, counsel and industrial organizations trying to make business decisions on the basis of advice from

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1. *In re Alappat,* 33 F.3d 1526 (Fed. Cir. 1994).
2. *In re Beauregard,* 53 F.3d 1583 (Fed. Cir. 1995).
3. *In re Trovato,* 60 F.3d 807 (Fed. Cir. 1995) (en banc); 42 F.3d 1376 (Fed. Cir. 1994) (vacated).


5. See Victor Siber and Marilyn S. Dawkins, *Claiming Computer-Related Inventions As Articles of Manufacture,* 35 IDEA 13 (1994). The term “floppy disk patent” is defined or otherwise described with greater particularity infra note 7 and accompanying text. For the moment, the term may be understood to mean a patent claim to a floppy disk on which a computer program has been encoded.

6. *Beauregard,* 53 F.3d. at 1583.
counsel are left without a proper basis for making sound predictions as to patentability and potential infringement liability in regard to floppy disk patents. This has lessened security of business expectation in one of the most important areas of technology. This, in turn, is a most undesirable state of affairs, which necessarily affects investment, technological advance, and industrial progress adversely.

A. WHAT IS A FLOPPY DISK PATENT?

Broadly speaking, a floppy disk patent claims a computer algorithm, or a computer program implementing an algorithm, as an article of manufacture. The article of manufacture is a computer readable storage medium or device, such as a floppy disk. A floppy disk patent, however, is only one form of software-related patent in article of manufacture format. In many or most cases, any storage medium or device is equivalent to a floppy disk for purposes of storing and claiming software, and claims of this type are typically worded to embrace any and all storage media and devices. Other possible information storage media that could play the same role as a floppy disk in this context include a read-only memory ("ROM"), such as a semiconductor ROM chip or an optical disk ("CD"), a dynamic random-access memory ("DRAM") chip, a tape, a magnetic core, a set of punched cards, or a hologram. The design choice among such expedients is ordinarily dictated by engineering and business considerations such as cost, required access speed and data transfer rate, whether the stored information must be modified and thus placed in a rewritable medium, stability and durability of the medium or device, presence of adverse environmental factors, space and weight limitations, and

7. Siber & Dawkins, supra note 5, at 14, and related text. Based on the analysis of Siber & Dawkins, one might adopt as a paradigm for this kind of claim a format such as the following:

An article of manufacture comprising a computer usable medium having computer readable program code means embodied therein for such and such an intended field of use, the computer readable program code means comprising:

- a first computer readable program means for causing a computer to effect [function A];
- a second computer readable program means for causing the computer to effect [function B], coupled to said first computer readable program means;
- a third computer readable program means for causing the computer to effect [function C], coupled to said first [and/or second] computer readable program means . . .

Id.

Siber & Dawkins also propose another claim format having process steps rather than apparatus means as elements. Id. at 14-15. The two formats appear to be functionally equivalent. Id. See also In re Trovato, 42 F.3d 1376, 1377-78 (Fed. Cir. 1994), vacated on other grounds, 60 F.3d 807 (Fed. Cir. 1995).
whether information security is a concern.  

B. Some Floppy Disk Patent Issues and the Scope of This Article

Either literally, because the claims drafter uses a generic term such as “computer-readable storage medium or device,” or by reason of the doctrine of equivalents, the scope of a floppy disk claim is likely—at least facially—to extend to any conceivable way to store any program implementing a given algorithm, and such storage is ordinarily a prerequisite to any use of the algorithm. That raises the same kind of question about preempting all practical use of the given algorithm that has attended the patenting of algorithms as such.  

There is a great deal that could be said about whether algorithms should be patentable, and many different ways in which one could address this state of affairs. One way is exemplified in the contribution to this symposium by my former student and now academic colleague, Professor Jay Thomas. His approach points out the fallacies of the legal reasoning advanced in support of floppy disk patents, that they interact badly with the main body of patent law, and the many problems their existence would or will cause for the users and clients of our patent system. Another approach is to study in detail the economic justifications argued in support of floppy disk patents and analyze whether they are sound and well-considered—or mere sophistry, insupportable by logic, empirical data, or common sense. Still another approach is to examine floppy disk patents as an epiphenomenon of a new intellectual property imperialism, and comment on the likely effect of such patents on the legal cultures and economic growth of developing countries on which they might be foisted. I propose to follow none of these ambitious approaches, having said so many of these things (particularly the first) for such a long time that I have lost interest in hearing myself say them again, at least for the time being. For purposes of the present article, I will assume, arguendo, that time’s arrow and entropy considerations counsel against pursuing any of these courses—the metaphor being that the bell is rung, the energy from it has moved far outward and slightly warmed a thousand pebbles, and it is now infeasible to try to unring the bell.


This article has a more modest and limited scope. But before getting to that, let me emulate Aristophanes telling you about the abuse with which he is not going to load Euripides and what he is not once again going to belabor Cleon about. Let me first tell you some more of the problems about floppy disk patents that I am not going to tell you about in this article.

The concept of floppy disk claims has spread beyond tangible storage media and devices to "propagated signal" claims. This means a claim to an ephemeral, supposed article of manufacture consisting of a propagated signal embodying a computer program. Some observers believe that software will be widely distributed in the future by Internet rather than only by distribution of tangible storage media. They have therefore proposed claiming a signal embodying a computer readable program code, to capture the full economic reach of commerce in software. The PTO appears willing to accept claims in signal format, at least in principle, on the ground that they are the result of human agency rather than natural forces (as would be, for example, a signal resulting from a bolt of lightning), and are therefore patentable subject matter.11 Even putting doctrinal problems aside,12 claims to computer program algorithms as

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11. See Nancy J. Linck & Karen A. Buchanan, Patent Protection for Computer-Related Inventions: The Past, the Present, and the Future, 18 HASTINGS COMM. & ENT. L.J. 659, 677-78 (1996). That human agency causes a result does not necessarily make the process or its result statutory subject matter. Id. For example, human agency caused the results in Gottschalk v. Benson and In re Schrader, and nonetheless there was no statutory subject matter. Gottschalk v. Benson, 409 U.S. 63 (1972); In re Schrader, 22 F.3d 290 (Fed. Cir. 1994). Some results of human agency are statutory subject matter and some are nonstatutory subject matter. Id. The principle distinguishing the two kinds of subject matter is more subtle than whether human agency is present (i.e., whether they were "made by man under the sun"). See Diamond v. Chakrabarty, 447 U.S. 303, 309 (1980). The appropriate principle appears to involve drawing the same kind of line of demarcation for elements along a continuum as is done in distinguishing idea and expression. See Baker v. Selden, 101 U.S. 99 (1879) (copyright case); Rubber-Tip Pencil Co. v. Howard, 87 U.S. (20 Wall.) 498 (1874) (patent case). This demarcation exercise requires the establishment of a method for distinguishing between an unduly abstract and thus sweeping characterization of a technological advance (impermissible for purposes of granting intellectual property rights because overbroad and thus prejudicial to competition and the interests of the public) and an unduly concrete, specific, and narrow characterization of the advance (potentially providing insufficient incentives to promote technological progress and thus prejudicial to the interests of the public). Id.

12. Determining where signals should be positioned among the present statutory classes (machines, manufactures, compositions of matter, and processes) of § 101 is a formidable problem. See 35 U.S.C. § 101 (1994). Proponents of propagated signal claims favor the article of manufacture pigeonhole, even though there appears to be no precedent for patenting an intangible (as well as ephemeral) "article of manufacture." Id. In testimony before Congress, the late P.J. Federico, a draftsman of the 1952 Patent Act recodification, stated that "[U]nder § 101 a person may have invented a machine or manufacture, which may include anything under the sun that is made by man . . . ." Chakrabarty, 447 U.S. at 309 (citing Hearings on H.R. 3760 Before Subcomm. No. 3 of the House Comm. On
articles of manufacture, whether as tangible or intangible means for embodying the programs, greatly expand the scope of patent infringement liability. They do so by substituting direct infringement\(^1\) liability for contributory\(^2\) or induced\(^3\) infringement liability. The big difference is that liability for direct infringement is strict; no requirement of knowledge or intent exists for liability to attach.\(^4\) In contrast, one must be a knowing infringer to be liable for contributory or induced infringement.\(^5\) A retailer that sold a floppy disk containing patented software, without knowledge of any underlying patent and without other conduct, would not be liable for infringement of an apparatus or process claim covering the software. But the same retailer would in the same circumstances be liable for infringement of a floppy disk claim on the software. An Internet access provider or telephone carrier that transmitted a signal embodying patented software, without knowledge of any underlying patent and without other conduct, would not be liable for infringement of an apparatus, process, or floppy disk claim covering the software. But the same service provider would in the same circumstances be liable for infringement of a propagated signal claim covering the software.

Signal claims can create "accident" problems for telecommunications carriers and Internet access providers far in excess of those which floppy disk claims (which they are less likely to infringe, absent any intermedi-

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the Judiciary, 82d Cong. (1951) (statement of P.J. Federico)). But perhaps this definition is too broad to be taken seriously. \(id\). Thus, even when the Supreme Court’s opinion in Diamond v. Diehr stated this dictum, in practically the next breath the Court qualified it by stating that not every discovery is embraced within the patent statute and that physical phenomena and abstract ideas were examples of subject matter excluded from patent protection. Diamond v. Diehr, 450 U.S. 175, 182-85 (1981); In re Warmerdam, 33 F.3d 1354, 1358 (Fed. Cir. 1994) ("Despite the oft-quoted statement . . . Congress did not so mandate."); Arrhythmia Research Technology, Inc. v. Corazonix Corp., 958 F.2d 1053, 1056 (Fed. Cir. 1992) ("There are, however, substantial qualifications to the apparent sweep of this statement."); In re Grams, 888 F.2d 835, 838 (Fed. Cir. 1989).

Obviously, moreover, all things outside the technological arts, such as jokes, puns, law review articles, business schemes, and Mafioso made men, are unpatentable even if made under the sun by men. \(id\). Whether signals containing information in the form of computer programs are statutory subject matter requires a more detailed method of inquiry than quickly repeating mantras lifted from the Book of Ecclesiastes. NEW AMERICAN STANDARD BIBLE, THE OPEN BIBLE EDITION 611 (1977) ("The words of the Preacher, the son of David, king in Jerusalem. ‘Vanity of vanities,’ says the Preacher, ‘Vanity of vanities! All is vanity.’ What advantage does man have in all his work [w]hich he does under the sun?"

Eccl. 1:1-3).


ate storage) create for them. While a judicially crafted exception for Internet transmissions has been proposed as to copyright infringement, \(^{18}\) similar judicial legislation for patent infringement claims appears unlikely to occur. This article does not attempt to address the new liability problems that signal claims or floppy disk claims will create for firms in portions of the chain of distribution of software products previously untroubled by such issues. \(^{19}\) The article also does not attempt to discuss whether the legal recognition of floppy disk or propagated signal claims will tend to create greater concentration in the software industry. This may occur if retailers, service providers, and others involved as intermediates in software distribution become unwilling to deal with new, small firms that may be unable to assure indemnification for patent infringement liability that they cause intermediates to incur unknowingly.

This article addresses none of those problems. Perhaps, others will try to address them. \(^{20}\) In my view, floppy disk patents must be regarded as a bad idea whose time has now come (just as railroad time irreversibly replaced steamboat time). It is therefore less useful to argue that their defects should bar their being allowed than it would be to seek ways to minimize the harmful impact of their defects. This article, accordingly, addresses how we should and should not allow floppy disk claims to be written, based on considerations of best furthering the policy goals of the patent system.

There is now an impasse. Unless appropriate preventive measures are adopted, we are in for a great deal of litigation and uncertainty over floppy disk patent claims because they have been left formless and rudderless. Any claim drafter can write anything, and the PTO has become demoralized over its losses or perceived losses. As a consequence, it has abdicated responsibility on the theory that its "customers" want floppy disk patents—never mind what the claims say. \(^{21}\) But the PTO's custom-

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18. See Religious Tech. Ctr. v. Netcom On-Line Communications, Inc., 907 F. Supp. 1361 (N.D. Cal. 1995) (holding that contributory or induced infringement standards should apply to what otherwise would be direct copyright infringement by Internet access providers). See also H.R. 3209, 105th Cong. (1998) (bill proposing limitation of Internet access providers' liability for copyright infringement). Arguably, an Internet access provider that caches a transmission of a computer program "makes" as well as "reproduces" the subject matter of any underlying intellectual property and thus infringes multiple rights. \(\text{Id.}\)


20. 35 U.S.C. § 271(g) (1994) (one area particularly deserving attention is amendment of the statute to excuse innocent infringement in this field. Consider, for example, how Congress fine-tuned the legislation to cause the importation of a product of a patented process patent infringement by conditioning liability on culpable conduct). See 35 U.S.C. § 287(b) (1994).

21. Some PTO officials have been quoted as saying that "most of the PTO's customers applauded" the Guidelines as a big step in the right direction.
ers, at least its corporate customers, are just as often potential mulctees as they are potential mulctors. Moreover, even the general public is a customer of the PTO, although some may have lost sight of that at times. Needed here is a mechanism for issuing only those floppy disk claims that serve the interests of all of the customers of the PTO, by recognizing the statutory policies of the patent act.

This article proposes an analytic framework for determining the patentability of novel and nonobvious advances sought to be claimed as software patents in article of manufacture format. The article focuses largely on the problems of how to confine the scope of such claims appropriately to the enabling disclosures and descriptions on which they are based, how to make such claims particularly and distinctly point out the nature and scope of the claimed invention, and how to limit the liability for infringing such claims to cases in which the accused infringer has actually taken the enabled and described subject matter. To accomplish these results, the article proposes adoption of administrative regulations establishing specific mechanisms—conditions and formats for article of manufacture claims in software patents. In the alternative, the article proposes that the same results can be accomplished by a similar statutory amendment enacting the proposed mechanisms.

II. BACKGROUND

Some preliminary explanation of how we came to the present impasse is in order. Since almost the inception of our patent system, inventors and their counsel have been testing the limits of what they can claim relative to what they have disclosed. The landmark case of O'Reilly v. Morse is illustrative. Morse invented a particular telegraphic apparatus, the so-called repeater circuit, that overcame the problem of noise degrading signal, which his predecessors had been unable to overcome with their devices. Morse claimed that apparatus in his earlier claims, and in his notorious Claim 8 he further claimed the use of electromotive


24. The repeater circuit is a cascade of relays, in which each closure of a relay contact provides the current for the coil that closes the next relay farther down the cascade. In effect, this is a series of nonlinear amplifiers, each providing a new "1" to the next amplifier before the existing signal "1" becomes indistinguishable from a "0" because of noise. The Supreme Court called this a "plan for combining two or more electric or galvanic circuits,
force to send and mark a message of intelligible characters or signs at any distance. He thus claimed, and preempted although he did not enable, the teletype, fax machine, television, transmission from a space satellite to Earth of digitized astronomic images, and many other devices and processes not invented until decades or more later (the Morse controversy occurred about 150 years ago).

The Supreme Court upheld Morse's claims to his particular apparatus but held Claim 8 invalid on two grounds. One was that Claim 8's scope exceeded Morse's enabling disclosure. The other ground was that, as a matter of law, Morse did not invent or discover the use of electromagnetic force to transmit intelligible signs at any distance. That was such an abstract and intangible characterization of the subject matter in controversy that it was an unpatentable idea rather than a patentable concrete embodiment of the idea.25 Rather, Morse invented only a particular apparatus for electrically transmitting intelligible characters in a particular way.

A. THE SUPREME COURT'S TRILOGY ON STATUTORY SUBJECT MATTER

The same issues came to a head in a series of Supreme Court decisions over a decade beginning in the early 1970s. In the trilogy of decisions, Gottschalk v. Benson,26 Parker v. Flook,27 and Diamond v. Diehr,28 the Court established two complementary principles: An algorithm or computer program, as such, is not statutory subject matter and is therefore unpatentable.29 But an industrial machine or process that merely utilized an algorithm or computer program, among other things, is statutory subject matter and patentable if novel and nonobvious.30 These decisions carry forward both branches of the earlier reason-

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29. As Justice Stevens expressed the concept for the Court in its Flook decision, an algorithm is a process in the ordinary sense of that word, but it is not the kind of process that the statute makes patentable. Flook, 437 U.S. at 593. See also In re Grams, 888 F.2d 835, 837 (Fed. Cir. 1989) (explaining the algorithm process aspect of Flook).
ing in the *Morse* case.

B. **FEDERAL CIRCUIT CASE LAW UP TO 1994**

Decisions of the Federal Circuit and its predecessor courts built on this distinction and addressed some of its ramifications. By about 1994, a set of criteria had begun to take form that distinguished statutory (i.e., patentable) subject matter from nonstatutory (i.e., unpatentable) subject matter in this field. The line of demarcation was not a simple, straight, bright line but, although somewhat jagged and convoluted, and a little dim in some places, it seemed comprehensible enough to provide business certainty.

In the case of an apparatus, or what purported to be an apparatus,\(^3\)

volved a computer program or computerized procedure for performing certain financial transactions. *Id.* The government contended that the claim was directed to an algorithm or a method of doing business and was therefore nonstatutory subject matter. *Id.* The Court merely decided that the subject matter was obvious over the prior art. *Id.*

31. A software patent may *purport* to be directed to an apparatus. For example, consider this claim: "An apparatus comprising a first means for squaring the length of a first side of a right triangle, a second means for squaring the length of a second side of the right triangle, a third means for producing a sum of the results produced by the first and second means, and a fourth means for extracting the square root of the sum, whereby is provided a quantity equal to the length of the hypotenuse of the right triangle." To be sure, this claim styles itself as an apparatus. Is self-designation determinative? Consider this exchange: "Call me a taxi." "OK, you're a taxi." Moreover, a combination of means is nominally an apparatus. Nonetheless, the foregoing claim is only an "illusory apparatus." The claim is directed to the Pythagorean Theorem and thus nonstatutory subject matter, except in the most extraordinary circumstances. Such an apparatus may readily be appreciated by considering the notional specification supporting this notional patent claim.

The claim may have either of two specifications supporting it. The first specification discloses only conventional implementing apparatus, such as a conventional ladder and a conventional squaring means, or it simply states that conventional expedients for implementing these functions are well known to those of skill in the art. This specification is ordinarily what one finds in reported cases on software patents. The claim supported by this specification is either obvious or directed to nonstatutory subject matter, depending on the conceptual pigeonhole you prefer. The reason why this specification is either obvious or directed to nonstatutory subject matter is that it recites only a sequence of calculations concededly carried out by conventional means. No novelty is asserted for anything but the combination of conventional means and nonstatutory subject matter, "considered as a whole." Considered as a whole, zero plus zero always equals zero, as Justice Stevens suggested in *Flook.* Parker v. *Flook*, 437 U.S. 584 (1978). The subject matter should be considered unpatentable under § 101, because the alleged inventor does not even purport to have invented an intrinsically "new" apparatus. See 35 U.S.C. § 101 (1994). Or perhaps it is preferred to utilize the methodology of the majority in *Diehr*, and its utilization of a presumptive rule of obviousness under § 103 for such claims. *Diamond v. Diehr*, 450 U.S. 175 (1981).

Either way, a defendant in a patent infringement case based on such a claim should not be obliged as a matter of course to hazard a free-ranging factual investigation of whether this subject matter is somehow not obvious when considered as a whole. (The case should be dismissed on motion, the way courts routinely dismiss antitrust conspiracy
the apparatus was statutory subject matter if the algorithm/computer program was carried out in a computer interconnected to other machinery or devices, such as a sensor/transducer, at the input end of the whole claimed system. The other machinery could also be a mechanical device, such as an automatic rubber mold opener, located at the output

claims when it is no more plausible that the defendant conspired than it is that the defendant acted out of unilateral self interest). See, e.g., Matsushita Elec. Indus. Co. v. Zenith Radio Corp., 475 U.S. 574 (1986).

Should the presumption of obviousness, if one operates under that mode of analysis rather than that of § 101, be rebuttable? See 35 U.S.C. § 101 (1994). Perhaps, one theoretical possibility exists for lack of obviousness. Ordinarily, the idea of computerizing a known procedure is an obvious expedient; at times, failure to consider it might be regarded as a form of malpractice. But it is conceivable that some exception might exist. Unless a patentee could show that computerizing a claimed procedure was not obvious, however, summary judgment or its PTO equivalent should issue against a claim of this type. (A comparable rule exists for information printed on paper medium. Such claimed subject matter is presumed obvious unless the patent applicant shows that the information and its substrate functionally interact in a novel manner that would not have been obvious to those in the art). See In re Gulack, 703 F.2d 1381 (Fed. Cir. 1983). The theoretical possibility that some patentees might prove it nonobvious for them to have decided to computerize a known procedure should not provide a justification, however, for software patentees to force defendants to a full-blown trial under a presumption of nonobviousness and a generalized, unfocused inquiry into obviousness.

Now, what of the second notional specification? By hypothesis, the second specification discloses a novel, nonobvious means for squaring and/or adding. This specification, however, is a figment of an overheated imagination. I have never seen such a patent in the reported cases, and those who wish to spin legal theories based on the need to protect such inventors fully are invited to point to examples of such inventions among the case reports. The reason that one finds only examples of the first class among reported decisions on software patents is simple: anyone who invented a new way to square or add would claim the new way, as such, rather than claim use of the new way for the very limited purpose of carrying out the Pythagorean Theorem. The first one would be a much more valuable patent, and the second one would be a trivial increment if one had the first one.

There is another way in which a software patent may purport to be directed to apparatus, which is much more difficult to address satisfactorily. This occurs when enough hardware trappings are inserted into a claim to create doubt over whether the claim recites more than just a programmed, off-the-shelf microprocessor chip. This occurs when a claim drafter adopts an expedient such as inserting the phrase "hard-wired TTL combinatorial logic" before one or more instances of the word "means" in a claim similar to that of the first paragraph of this note. See Ex parte Akamatsu, 22 U.S.P.Q.2d 1915 (Bd. Pat. App. & Int. 1992). That is to say, in a manner of speaking, "I claim the Pythagorean Theorem carried out by means of conventional hardware circuitry." Must this be addressed under § 103 rather than § 101? See 35 U.S.C. §§ 101, 103 (1994). If nothing else, § 103's mode of inquiry is a far more expensive one. See 35 U.S.C. § 103 (1994).

But all of the foregoing is only background to the controversy over article of manufacture claims addressed in this paper. The foregoing problems concern the apparatus claims to which the article of manufacture claims addressed in this paper relate. This article leaves such problems to others. See, e.g., Thomas, supra note 10, passim (addressing how to solve problems with claims in article of manufacture format once you have solved the other problems in patenting software—as an apparatus or process).

32. See In re Abele, 684 F.2d 902 (C.C.P.A. 1982).
end\textsuperscript{33} of the whole claimed system and performing more than insignificant post-solution, responsive activity after utilization of the algorithm. Apparently, the apparatus could sometimes be pretty flimsy and still pass muster—for example, an analog-to-digital converter at the input end\textsuperscript{34} or a look-up ROM in the middle.\textsuperscript{35} A claim considered to be directed to an algorithm, as such, however, without adequate apparatus trimmings, was unpatentable.\textsuperscript{36}

In the case of a process, a claim would cover statutory subject matter if it (i) was limited to a specific apparatus environment, (ii) involved the transformation of one substance into another, or (iii) involved the manipulation and transformation of electrical signals representative of physical parameters (e.g., temperature, pH, reflected seismic energy, cardiac muscle electropotential).\textsuperscript{37} If the court found that the claim did none of those things, as it did in \textit{In re Schrader}, the process was unpatentable as nonstatutory subject matter.\textsuperscript{38}

C. \textit{Alappat} and Afterwards

The state of the law appeared to destabilize abruptly in mid-1994, in the wake of the \textit{en banc} Federal Circuit’s \textit{Alappat} decision.\textsuperscript{39} The majority opinion in \textit{Alappat} was sufficiently cryptic that it was not apparent which of several things the court had held it patentable to claim. One possibility, which in retrospect now seems the most likely one, was that a claim to a differently programmed generic microprocessor interconnected with various parts of an oscilloscope, and operating under the influence of an algorithm to smooth a jagged line on a screen display on the oscilloscope, was patentable. Another possibility, however, was that the \textit{Alap-
pat court had made it possible to claim a differently programmed generic microprocessor, operating under the influence of the algorithm in question, where the claimed thing might be used with an oscilloscope, or instead might be used in any other machine environment—and where it might be used to smooth a jagged line on an oscilloscope screen display, or it might be used to perform whatever other function of which it was capable anywhere. Still another possibility, although unlikely, was that the court had held that a differently programmed generic microprocessor, without more, was patentable.40

The question was resolved in July of 1998, and was reflected some months ago in the oral argument before the Federal Circuit of a patent infringement case involving financial software.41 The patentee's counsel contended that Alappat stood for the proposition that a newly programmed general-purpose digital computer, without more, was statutory subject matter as a "machine." Counsel so argued because the financial data processing software at issue in the case had been claimed with no further apparatus limitations. The author of the court's Alappat opinion then responded to counsel, "That's what you think Alappat held?" Counsel responded affirmatively, different judges made different grimaces, and the patent bar now has a vaguely articulated standard for determining the patentability of mathematical algorithms.42

Different post-Alappat decisions of Federal Circuit panels have reflected different interpretations of Alappat by different members of the en banc Alappat court. Thus, in 1994, In re Trovato I43 and In re Warmerdam44 appeared to reflect the first interpretation of Alappat. But In re Lowry45 appeared to reflect the second interpretation. Then in 1995, in Trovato II, the Federal Circuit mysteriously vacated Trovato I for reconsideration in the light of the mid-1995 (unadopted) draft of the PTO's Software-Patent Guidelines.46 Also, in early 1995, in In re Beau-

42. The same colloquy ended with a judge's characterization of counsel's patent as being directed, unlike the Alappat patent, to "nothing but data; data, data, data." The implications of that remark for floppy disk patents are unclear.
43. In re Trovato, 42 F.3d 1376 (Fed. Cir. 1994) (hereinafter "Trovato I") (vacated); 60 F.3d 807 (Fed. Cir. 1995) (en banc) (hereinafter "Trovato II").
44. In re Warmerdam, 33 F.3d 1354 (Fed. Cir. 1994).
45. In re Lowry, 32 F.3d 1579 (Fed. Cir. 1994).
further proceedings in accordance with the Commissioner's concessions" made in arguing for a dismissal of the appeal as moot and for a remand. The important concession was "that computer programs embodied in a tangible medium, such as floppy diskettes, are patentable subject matter under 35 U.S.C. § 101 and must be examined under 35 U.S.C. §§ 102 and 103." In 1996, the PTO revised the draft Software-Patent Guidelines and published them in final form. Since the adoption of the Guidelines, the State Street Bank decision represents the Federal Circuit's most recent decision of consequence in the field. Nonetheless, the events of 1995 and 1996 deserve a recapitulation in more detail.

D. THE ISSUES IN BEAUREGARD

Beauregard was a test case that might have shed more light on the issues that this article addresses, but neither the PTO nor the Federal Circuit was in the mood for another tilt at that windmill in 1995. In Beauregard, IBM sought to bring before the Federal Circuit its idea that algorithms (or software inventions, if you prefer) should be claimable in essentially this format: an article of manufacture comprising a storage medium (e.g., floppy disk) encoded with machine-readable computer program code for carrying out an algorithm. The algorithm could be recited either as a sequence of means for performing various mathematical functions or as the steps of performing the functions.

The PTO Board had held the claims unpatentable under §§ 101 and 103. The grounds were related because they both involved variations on the "printed matter" rule. The § 101 argument against patents on printed matter is that a claim to a book, where it is conceded that books in general are old, and the only assertion of novelty is directed to the new material (content) printed in the book (or new material conventionally encoded on a conventional floppy disk, as here), is directed to nonstatutory subject matter. This point is like one made in the Diehr dissent, where Justice Stevens analyzed Flook as holding that a claim is not directed to the kind of invention covered by § 101 when the inventor con-

47. In re Beauregard, 53 F.3d 1583 (Fed. Cir. 1995).
48. Id.
49. Guidelines, supra note 4.
50. In re Beauregard, 53 F.3d 1583 (Fed. Cir. 1995).
51. Siber & Dawkins, supra note 6. (Siber and Dawkins were counsel for IBM in the Beauregard case).
52. Beauregard, 53 F.3d at 1583. The particular algorithm involved in Beauregard was a way to fill polygons, a procedure relevant to computer-aided design, font generation, and other graphics applications. Id. See also Richard H. Stern, Solving the Algorithm Conundrum: After 1994 in the Federal Circuit, Patent Law Needs a Radical Algorithmectomy, 22 AIPLA Q.J. 167, 195-203 (1995) (describing the particular algorithm involved in Beauregard and the parties' positions).
cedes that nothing in the claim is new except for a new algorithm.\textsuperscript{53} Judge Archer made a similar point about the unpatentability of a conventional CD encoded with a new song, in his \textit{Alappat} dissent.\textsuperscript{54}

The § 103 argument against printed matter patents is that no patentable weight can be given to the identity of the information (content) in a book (or a floppy disk), if that is the only thing about the book (or the floppy disk) that differs from the prior art. Rather, printed matter can be nonobvious, and thus patentable subject matter, only if the printed matter interacts with the substrate (e.g., book or floppy disk) in a novel and nonobvious way.\textsuperscript{55}

After the PTO Board's decision in \textit{Beauregard}, the Federal Circuit decided \textit{In re Lowry}.\textsuperscript{56} In that case, a Federal Circuit panel held that the printed matter rule did not apply to machine-readable material, as distinguished from human-readable material, when the alleged printed matter was a memory device said to be "structured" in accordance with a novel "data structure."\textsuperscript{57} The \textit{Lowry} decision made the PTO believe that the PTO Board's \textit{Beauregard} opinion was not defensible, because it rested on the printed matter doctrine. Accordingly, the PTO sought to have the \textit{Beauregard} case remanded to the PTO Board so that the decision could be shored up. It has also been suggested that the PTO was both convinced that the Federal Circuit would rule against it in \textit{Beauregard} and that the Justice Department would then refuse to approve an appeal to the Supreme Court—which made the PTO eager to avoid a precedential decision in the case.

IBM thought that a remand would not only deprive it of its test case vehicle, but give the PTO an opportunity to shore up the PTO Board opinion on other grounds (for example, prior art). IBM therefore opposed the PTO's remand motion, the first time the PTO made it. IBM argued that the PTO was hypocritical in asking for a remand on the alleged grounds that it wanted to reconsider the matter in the light of \textit{Lowry} because it "appear[ed]" (the PTO's use of this weak verb clearly displeased IBM) that the rejection was inconsistent with \textit{Lowry}.\textsuperscript{58} Absent a more abject confession of error by the PTO, IBM contended, it would be unfair to IBM to remand. The Federal Circuit then denied the PTO's

\begin{itemize}
\item \textsuperscript{54} \textit{In re Alappat}, 33 F.3d 1526, 1545-46 (Fed. Cir. 1994).
\item \textsuperscript{55} See \textit{In re Gulack}, 703 F.2d 1381 (Fed. Cir. 1983).
\item \textsuperscript{56} \textit{In re Lowry}, 32 F.3d 1579 (Fed. Cir. 1994).
\item \textsuperscript{57} \textit{Id.} at 1583.
\item \textsuperscript{58} \textit{In re Beauregard}, 53 F.3d 1583, 1583 (Fed. Cir. 1995). IBM argued that everyone knows that the PTO pays no attention to a Federal Circuit panel decision unless it is "a decision that the Commissioner happens to agree with." \textit{Id.} IBM said that "appears" and similar words of qualification belied the PTO's sincerity, and that on remand the PTO would just reject again, on some basis distinguishing \textit{Lowry} and limiting it to its facts. \textit{Id.}
\end{itemize}
motion without explanation. The PTO then moved again for a remand, this time making the concession quoted in the Federal Circuit's order. The PTO also advised the court that it planned to issue new guidelines to examiners on how to process computer-related patent applications. This led to the Federal Circuit's granting the renewed motion for a remand, to the *Trovato II* decision, and about one year later to publication of the Software-Patent Guidelines.59

E. THE GUIDANCE FROM THE SOFTWARE-PATENT GUIDELINES

The guidance that the Software-Patent Guidelines give the patent bar is Delphic, at best. The *Guidelines* advise practitioners to pay a great deal of attention to drafting a specification describing at least one embodiment of the claimed invention fully enough that persons of routine skill in software arts can practice the invention. The Software-Patent Guidelines also tell us in great detail that the PTO will allow claims of the kind that the Federal Circuit and its predecessor courts had approved before *Alappat*.60 They also tell us in much detail that the PTO will refuse to issue patents on conventional CDs encoded in a conventional manner with new songs.

The *Guidelines* language on floppy disk claims is very sparse, however. It tells us little more than that the PTO intends in some, unexplained circumstances to allow floppy disk claims, even though there is no case law specifically addressing them. The Guidelines do not address the issue of what relation, if any, an allowable floppy disk claim must have to a claim of the type approved in or before *Alappat*. In particular, they do not address the permissible scope of a floppy disk claim, relative to that of a machine or process claim that was allowable under pre-*Alappat* case law. Finally, the Guidelines do not address the relationship between the enabling disclosure underlying a floppy disk claim and the field-of-use scope of the claim.61

The remainder of this article is directed to an attempt to try to supply some sensible answers to the questions that the PTO left unanswered in the Software-Patent Guidelines.

60. *Id.* The *Guidelines* advise us that the PTO considers allowable claims such as those approved in *Abele* and *Schrader*. In re *Abele*, 684 F.2d 902 (C.C.P.A. 1982); In re *Schrader*, 22 F.3d 290 (Fed. Cir. 1994).
61. MPEP § 2106.01 discusses enablement and description in abstract terms. MPEP § 2106.02 purports to discuss disclosure in "computer programming cases" but in the end only concludes with this general guideline: an examiner should challenge the sufficiency of disclosure if the applicant fails to provide "a reasonably detailed flowchart." No specific comments are made about floppy disk claims, whether they present any special enablement problems, or whether they should be treated any differently from apparatus or process claims.
III. ANALYSIS

As a preliminary manner, some general principles should be set out to describe the premises on which this analysis is based. The first is that the principles codified in Paragraphs 1 and 2 of § 112 of the patent statute\textsuperscript{62} should be of paramount concern. To be allowable, a floppy disk claim should have a scope commensurate with the enabling disclosure and the description in the specification.\textsuperscript{63} Moreover, what applies to allowability should apply equally to interpretation of claim scope in patent infringement actions. If a patentee teaches the world no more than how to send messages via a telegraphic repeater apparatus, he should not get a patent on all use of electromotive force for sending a message of intelligible signs at any distance. By the same token, an allowable floppy disk claim should clearly advertise its scope, in terms of what acts and conduct by others are to be held infringement.

Finally, there is subject matter (such as the Pythagorean Theorem) that could not be claimed as an allowable process or apparatus under Alappat and its predecessors, because it is nonstatutory subject matter, considered as a whole. That kind of subject matter should not be claimable as a floppy disk, either. The rationale for floppy disk patents, to the extent that there is one, is to make additional persons in the distribution chain for software technology liable where they previously might have escaped liability because it was too difficult or expensive to pursue them. The rationale is not one for making algorithms, as such, patentable subject matter or for otherwise expanding the nature of the kind of advances that can be patented.\textsuperscript{64}

The foregoing principles lead to the conclusion that a floppy disk claim should be allowed only if at least a hypothetical process or apparatus claim would be allowed, directed to the same subject matter. Thus, suppose that a machine doing act or task X by means including use of a

\textsuperscript{63} See Vas-Cath Inc. v. Mahurkar, 935 F.2d 1555 (Fed. Cir. 1991).
\textsuperscript{64} In re Beauregard, 53 F.3d 1583 (Fed. Cir. 1995). IBM explained the rationale for floppy disk claims in its briefs in the Beauregard case, and the PTO appears to have accepted them in the concession it stated to the Federal Circuit in that case. Id. As IBM explained, the reasons for recognizing claims in floppy disk format are twofold:

(1) The floppy disk of Beauregard was, metaphorically, no more than a “cam” that operated the computer apparatus that was conceded as patentable, or that activated the computer process that was conceded as patentable. Hence, no additional real-world claim scope or “monopoly” would be created by allowing this kind of “subcombination” or cam claim; and

(2) The claim to the floppy disk was needed to facilitate patent infringement suits against contributory infringers and inducers of infringement of the allowed apparatus and process claims. There was no devious purpose to reach anything wider or to obtain a broader monopoly than the legitimate monopoly of the apparatus and process claims.

Id.
given algorithm A, or a computer program Y embodying algorithm A, is patentable. Then, a floppy disk in which the computer program Y is encoded should be patentable only to the extent that it is directed to the same task X that the machine patent reaches (recognizing that our focus is on the information storage medium aspect of the overall system). Beyond that, however, a floppy disk patent should not be allowable. By the same token, using a floppy disk encoded with Y to perform task Z, where Z is not equivalent to or a part of X, should not be held to be patent infringement.

This immediately raises a claim scope problem with which the Alappat court struggled. A patent is ordinarily allowable only when it is directed to an implementation of an idea, rather than to the idea as such. This may be illustrated by a hypothetical invention or discovery of a system for visual pattern recognition (for example, a system for checking a signature on a check against a genuine signature on file with a bank). The system uses a camcorder to provide a digitized signal representative of the signature on a check. This signal is to be compared with that of the reference signature on file. The pattern recognition procedure uses convolution integrals, which means that the computational part of the system needs to carry out many multiplications. A problem is that multiplications use much more computing power than other operations such as addition and subtraction.

The point in which this hypothetical system departs from prior art is that the multiplications of the values of various parameters are not carried out in the ordinary, computer resource intensive manner. Instead, the invention does this in a much less resource intensive manner, by taking advantage of the quarter-square algorithm, a special case of the Binomial Theorem. The special case is that \((a+b)^2 - (a-b)^2 = 4ab\). Hence, if one wants to get the product of two parameters, \(a\) and \(b\), one need not go through the resource intensive process of multiplying \(a\) by \(b\). Instead, one sums \(a\mathcal{E}\), looks up in a table 0.25 of the square of the sum; then one takes the difference \(a-b\), looks up in a table 0.25 the square of the difference; and then one takes the difference of the two quarter-squares. That difference equals the product \(ab\).

A process or apparatus patent on this hypothetical invention would undoubtedly have limitations as to the nature and source of the input signal to the system (which comes from a camcorder that scans the signature on a check), or have some other interconnection of the computational part of the system with mechanical devices. These so-called structural limitations and interconnections with devices other than the computational part of the system add concreteness to the claimed subject.

matter and at the same time limit the scope of the system's apparatus or process claims to a particular environment. The specification would teach enabling use of the system in that environment, but would not teach its use in other environments unknown to the inventor. It is assumed that this system, considered as a whole, is novel and nonobvious.

The two accompanying figures illustrate the point. A given system as a whole is shown in each box surrounded by a double line. What is outside the double line boxes is the external environment. The interior boxes surrounded by single lines are subassemblies within the given system. In the first, Figure One, the leftmost subassembly is an input device ("Input") such as the previously mentioned camcorder for providing a digitized representation of a check signature. The digitized signal from the input device is fed to the middle subassembly, a computer device (such as a personal computer or a programmed microprocessor chip). The computer device itself is statutory subject matter but well known and thus unpatentable per se. It is, however, programmed in accordance with a notional novel and nonobvious computer program, such as a program for multiplying parameters in accordance with the quarter-square algorithm. The program is stored in a floppy disk (or ROM) accessible to the computer device. The rightmost subassembly in Figure One is a post-solution output device ("Output"), such as a conveyor for moving valid checks to a subsequent processing location, if the computer procedure determines that the signature is valid. (If the check is a forgery, a buzzer sounds to summon the bunco squad and/or a device sets in motion a computerized protest of the check to the previous holder and debits its account.) This device is operatively connected to the computer device so that it operates in accordance with the results of the computer device and its programmed computations.
Under prevailing case law, the system as a whole is statutory subject matter and is patentable if novel and not obvious. In terms of the facts of the Alappat case, the system of Figure One may be considered an oscilloscope system in which the leftmost subassembly feeds signals representative of screen coordinates to the computer device. The computer device processes them in accordance with a smoothing algorithm, and provides a control signal to the rightmost subassembly. The latter uses the control signal to control the intensity of a light beam illuminating the screen display of the oscilloscope (for example, it controls current amplitude in the neck coil of a cathode ray tube). The assumed facts concerning the hypothetical check verifier device are thus on a par with those of Alappat. Figure One depicts a machine system that utilizes a programmed computer.

Figure Two, in contrast, lacks the arrows interconnecting the computer device with the input or output devices that flank the computer in Figure One. Thus, Figure Two could represent the computational unit of the Alappat case considered in isolation, with nothing but data in and data out. By the same token, Figure Two could correspond to the computational unit of the check verification system, without the camcorder or other devices. This device does nothing but multiply input numbers to produce their product as an output. The system of Figure Two is equivalent to a personal computer ("PC") into which someone keypunches numbers, so that a computer program in the PC can multiply them and display their product. The "system" is an old computer using a new computer program which has "configured the computer into a new structure." In other words, it is like an old player piano into which a new piano roll has been inserted or an old stereo system whose loudspeaker is being restructured in accordance with a new CD.

If the proper interpretation of Alappat as a precedent is that the claimed subject matter in that case was statutory subject matter because of the interconnection and inter-relationship of the programmed microprocessor chip and the rest of the oscilloscope, the device of Figure Two is unpatentable. Depending on how one decides to analyze it, the subject matter is unpatentable either because it is anticipated or obvious or because it is nonstatutory subject matter. Only if Alappat is understood to hold that a programmed computer device, by itself, without interconnections to other physical apparatus such as a sensor or automatic mold opener, is patentable when the computer program is novel and non-obvious, is the device of Figure Two patentable. (This would be equivalent to holding that any 486 PC that you buy "off the shelf" in a

68. But see In re Alappat, 33 F.3d 1526 (Fed. Cir. 1994) (en banc); In re Bernhardt, 417 F.2d 1395 (C.C.P.A. 1969).
store is a patentable new machine if you take it home, insert into it a floppy disk containing a new, nonobvious program, and turn the power on). As already suggested, the first of these interpretations of Alappat probably represents the better view.

A further problem concerns properly adjusting the scope of a claim to the supporting disclosure. The check verification system of Figure One does not have to operate in real time nor within the confines of a space probe. It therefore does not matter whether the storage medium is a floppy disk, as indicated in Figure One, or a memory chip, a gate array chip, or a hologram. That the scope of a so-called floppy disk claim extends to any and all conceivable storage media and devices may well be immaterial for the check verification field of use. Nonetheless, the same pattern recognition algorithm that the claim describes and effectively claims may be useful, also, for detecting locations of SCUD missiles from aerial photographs, for picking up and assembling components on a conveyor belt in a factory, and for navigating a space vehicle at high speed through an asteroid belt while being pursued by hostile aliens firing phasar torpedoes. Some of these applications or fields of use (the last one, for example) require operation in real time. Some of them are subject to ruggedness, size, and weight constraints. It is no more clear that an enabling disclosure of pattern recognition for check verification purposes should be considered enabling for space vehicle navigation purposes than it was clear that Morse’s description of the repeater telegraph apparatus enabled facsimile machines and television equipment.

This article now undertakes to provide a rationale under which a claim to the floppy disk of Figure One is patentable and a claim to the floppy disk of Figure Two is unpatentable. More generally, what rules should be applied to claims in article of manufacture format to accomplish the result that only those claims that correspond in scope to patentable apparatus or process claims are patentable? At the same time, it is proposed to utilize the same mechanism for the purpose of tailoring the scope of article of manufacture claims to the enabling disclosure. That is, how can a floppy disk claim directed to an application such as the notional check signature verification system be kept from covering pattern recognition in space vehicle navigation if that is not enabled in the

69. This would also require that Alappat overruled, sub silentio, In re Abele and In re Schrader, and that In re Warmerdam was subsequently misdecided. In re Alappat, 33 F.3d 1526 (Fed. Cir. 1994) (en banc); In re Abele, 684 F.2d 902 (C.C.P.A. 1982); In re Schrader, 22 F.3d 290 (Fed. Cir. 1994); In re Warmerdam, 33 F.3d 1354 (Fed. Cir. 1994).

specification but both systems and their storage media use the same pattern recognition algorithm?

A. APPROACHES TO PROVIDING CLAIM RULES

Consider again Figure One and the hypothetical check signature pattern recognition device. Suppose, for purposes of discussion, that the computer program can be simplified to describe just one multiplication operation using the quarter-square algorithm. As previously stated, a camcorder (left subassembly of Figure One) feeds a digitized representation of the signature on a check to the computer. The computer reads the computer program from the floppy disk, fetches signature reference data from memory, and makes a multiplication. If the calculation leads to the conclusion that the signature is valid, the check is automatically passed into a receiving bin and conveyor for further processing (right subassembly of Figure One). But if the check is a forgery, a buzzer sounds to summon the bunco squad (same right subassembly).

Consider the paradigm that the claims of the Beauregard case suggest for the floppy disk of the foregoing system. Following that paradigm, the format of a floppy disk claim could be as follows:

An article of manufacture comprising a computer usable medium having computer readable program code embodied therein for providing a product of a first parameter and a second parameter, the computer readable program code comprising:

means for causing a computer to take the sum of the first parameter and the second parameter, providing a sum;

means for looking up in a memory coupled to the computer 0.25 of the square of said sum, providing a sum-square;

means for causing a computer to take the difference of the first parameter and the second parameter, providing a first difference;

means for looking up in a memory coupled to the computer 0.25 of the square of said first difference, providing a difference-square;

means for causing a computer to take the difference of the sum-square and the difference-square, whereby is provided the product of the first parameter and the second parameter.

If a floppy disk claim is allowed in this format, however, it would appear to be infringed by any multiplication of two parameters using the

71. In re Iwahashi, 888 F.2d 1370 (Fed. Cir. 1989) (hypothetical case herein patterned on a simplified version of the facts of Iwahashi).
72. Siber & Dawkins, supra note 5.
73. Id. (I have omitted from the hypothetical claim the couplings among the various means, to make the claim simpler to read. As is well known to drafters of claims, however, the knee bone must be connected to the thigh bone, the thigh bone must be connected to the hip bone, and so on, so that these dry bones will live again for purposes of § 112).
quarter-square algorithm. This claim is not limited to use of the quarter-square algorithm in a visual pattern recognition system for check signatures, nor to a system having a camcorder input or a conveyor output. Instead, the claim is infringed by a system for determining the area of a wall in order to ascertain how much paint is needed to paint it, or for determining the area of a field to ascertain how much fertilizer one needs to spread over it, or for determining what the bill should be in a grocery store if a customer buys three lemons at 25 cents apiece. The computer and the floppy disk do not “know” what the physical parameters corresponding to a and b are, or what will be done with the resulting product. The computer program means encoded in the floppy disk is the same, and works equally well, for any application.

Absent from the proposed floppy disk claim are whatever limitations about x-ray CAT scanners, automatic mold openers, electrocardiographs, and the like (here, for example, a camcorder for taking a digitized visual image of a signature on a check) that conferred patentability on the related apparatus or process claims to the entire system. It might be argued that § 112, Paragraph 6 will confine the means of the floppy disk claim to the specification, to obviate any O'Reilly v. Morse problem perceived here. That conclusion would be incorrect. The means of this floppy disk claim are only means for doing calculations, which will have a very broad range of equivalents. They are not means for performing a particular pattern recognition procedure. Typically that would be the case for any claim of this type. The problem does not conveniently go away because the means of an infringing calculation must be those of the specification or their equivalents. The means subject to the limitations of § 112's Paragraph 6 are those of the part of the specification describing a calculation rather than those of the part of the specification describing the physical function that the system performs.74

The same exercise may be repeated using a process step format rather than the format of a series of means. The following claim illustrates that format.75

An article of manufacture comprising a computer usable medium having computer readable program code embodied therein for providing a product of a first parameter and a second parameter, the computer

74. Furthermore, a determined claims drafter could stymie the applicability of § 112 ¶ 6 by replacing each means term by a comparable generic noun. For example, instead of means for summing a and b one could have an addition code module for summing them. See Greenberg v. Ethicon Endo-Surgery, Inc., 91 F.3d 1580 (Fed. Cir. 1996) (holding that a “detent mechanism” is not a “detent means” for purposes of invoking § 112. In addition, the claims drafter could use a process claim format, as discussed in the text that follows. Siber & Dawkins, supra note 5, 14-15.

75. See Siber & Dawkins, supra note 5, at 14-15 (proposing an alternative process format for claims). The claims drafter used both formats in the patent application in the Beauregard case. In re Beauregard, 53 F.3d 1583 (Fed. Cir. 1995).
readable program code causing a computer to perform the following steps:

- taking the sum of the first parameter and the second parameter, providing a sum;
- looking up in a memory coupled to the computer 0.25 of the square of said sum, providing a sum-square;
- taking the difference of the first parameter and the second parameter, providing a first difference;
- looking up in a memory coupled to the computer 0.25 of the square of said first difference, providing a difference-square;
- taking the difference of the sum-square and the difference-square, whereby is provided the product of the first parameter and the second parameter.

The very same conclusions as to claim scope follow, however. The subject matter claimed in this article of manufacture claim is not limited to that of the related process claim, because the elements prescribed in the Schrader decision\textsuperscript{76} are not present in the article of manufacture claim, even if they occur in the related claim to a process.\textsuperscript{77}

Moreover, because the article of manufacture claims presented are not limited in scope to the check signature verification system that has been described, they are probably not patentably enabled for all of the things that the claim covers. For example, the specification for a check signature verification system would probably not contain any enabling disclosure as to how to provide a leftmost subassembly of Figure One that was adapted to inputting the dimensions of a field that is to have fertilizer spread over it, or a rightmost subassembly for metering out and dispensing the fertilizer in accordance with the area determined by the multiplication procedure. Furthermore, the specification probably would not contain a description of the invention corresponding to the claim scope. Accordingly, the claims would not satisfy the requirements of the first paragraph of § 112. The overbreadth might also contravene the requirement of the second paragraph of § 112 that the claims must distinctly point out the scope of what the inventor regards the invention to be.

\textsuperscript{76} In re Schrader, 22 F.3d 290 (Fed. Cir. 1994). See supra note 38 and accompanying text.

\textsuperscript{77} In re Schrader, 22 F.3d 290 (Fed. Cir. 1994). For example, the corresponding hypothetical process claim could follow the Schrader paradigm of patentability by referring to use of a camcorder input sensor apparatus. \textit{Id.} It could also follow that paradigm by including manipulation and/or transformation of a digitized signal from the camcorder trained on a check signature. \textit{Id.} But those elements do not concern the coding of a computer program onto a floppy disk nor do they dictate the particular code used. \textit{Id.} Hence, they cannot sensibly be carried over to the article of manufacture claim. \textit{Id.}
Besides overbreadth from the public interest and competitive standpoint of O’Reilly v. Morse, these claims have another fault. Typically, the algorithm of such a claim is known or an obvious variation on prior art. Thus, the curing algorithm in Diamond v. Diehr, the Supreme Court’s last software patent decision, corresponded to the well-known Arrhenius Equation for mass action. Accordingly, it is quite likely that a claim in either of the preceding floppy disk formats would be invalid over the prior art, absent the kind of limitations that would have conferred patentability over the prior art on the machine or process forms of the claim. An infringer, particularly one using a floppy disk to carry out the procedure involved for a purpose different from that of the patentee, is likely to be able to say that she merely copied the prior art or made an obvious variation on what was already well known and thus in the public domain. A claim in this article of manufacture format may therefore be as self-defeating for the applicant as it is overbroad from a competitive standpoint.

B. STATEMENTS OF INTENDED USE

Some way must be found, if it can be, that will bring the scope of such a floppy disk claim into a reasonable correspondence with the apparatus or process using the algorithm or computer program embodied in the floppy disk. To keep a floppy disk claim from being directed to a nonstatutory algorithm or computer program, as such, to give the claim a scope supported by its disclosure, and to prevent the claim from being invalid as reading on the prior art, the claim drafter must find a way to make the scope of a floppy disk claim correspond to the apparatus or process claim directed to the use of the floppy disk. Unless those results can be accomplished, there should not be floppy disk claims.

One possibility is to place a statement of intended use and/or other environmental limitations in the preamble of the claim to limit the coverage of the claim to a particular field of use, to a particular apparatus environment, or to use in connection with input signals representative of particular physical parameters. The legal effect of preamble limitations is debatable.

Ordinarily, “mere” statements of intended use in a pre-

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79. But see Flook, 437 U.S. at 593 (holding a field of use limitation insufficient to make patentable a claim to a numerical calculation procedure).

80. See Bell Communications Research, Inc. v. Vitalink Communications Corp., 55 F.3d 615, 620 (Fed. Cir. 1995) (“Much ink . . . has been consumed in debates regarding when and to what extent claim preambles limit the scope of the claims in which they appear.”).
RATIONALIZING FLOPPY DISK CLAIMS

Rationale of an apparatus claim are not considered limitations on the scope of the claim for purposes of avoiding prior art, since a new use for an old apparatus does not patentably distinguish the claimed apparatus from the old apparatus.\textsuperscript{81} Furthermore, mere statements of intended use are not part of the claim for determining whether it is a multi-means combination claim permitted by § 112 Paragraph 6, or an impermissible single-means claim.\textsuperscript{82}

On the other hand, sometimes a statement of intended use is not just “mere.” The Federal Circuit recently gave decisive weight to a preamble limitation as to intended use. In \textit{Rowe v. Dror},\textsuperscript{83} a claimed “balloon angioplasty catheter” had the same structure as a known, general-purpose “balloon catheter.” The PTO’s Board considered the word “angioplasty” in the claim preambles a mere statement of intended use, incapable of patentably distinguishing the device from the prior art, but the Federal Circuit reversed. It held “angioplasty” to be a distinguishing limitation on the basis of its review of the entire patent record. The record showed that a balloon angioplasty catheter had to be capable of expanding a stenosis in a constricted coronary artery, although general-purpose balloon catheters did not need to possess this capability. (Presumably, although unremarked in the court’s opinion, this capability was not an inherent capability of all general-purpose balloon catheters.)\textsuperscript{84} The \textit{Rowe} decision, although it may prove limited to its facts, points to the possibility that the Federal Circuit will, at least in some cases, consider a field of use limitation in the preamble of an apparatus claim to be capable of distinguishing the apparatus from a structurally similar prior art apparatus.

Moreover, the \textit{Alappat} majority placed considerable weight in determining patentability (in that case, statutory subject matter or not, rather than novelty as in \textit{Rowe}) on a use-limitation and apparatus-environment statement in the claim’s preambles.\textsuperscript{85} Finally, a use limitation in a process claim must carry some patentable weight, because § 100(b) of the

\textsuperscript{81} See, e.g., Roberts v. Ryer, 91 U.S. 150, 159 (1875); LaBounty Mfg., Inc. v. USITC, 958 F.2d 1066, 1075 (Fed. Cir. 1992).
\textsuperscript{82} See In re Hyatt, 708 F.2d 712, 714 (Fed. Cir. 1983) (“[T]he invention defined is what follows the word ‘comprising’ . . . .”).
\textsuperscript{83} Rowe v. Dror, 112 F.3d 473 (Fed. Cir. 1997).
\textsuperscript{84} Id. at 480. The court observed: “About the most that can be said for the [reference] is that it does not describe anything inconsistent with angioplasty procedures. However, this negative pregnant is not enough to show anticipation.” Id.
\textsuperscript{85} In re Alappat, 33 F.3d 1526 (Fed. Cir. 1994). The statement was that the device was one “for converting vector list data representing sample magnitudes of an input waveform into anti-aliased pixel illumination intensity data to be displayed on a display means.” Id. at 1538-39. The court interpreted this statement to mean that the claimed device accepted signals from one part of an oscilloscope, processed them, and then sent illumination intensity signals to another part of the oscilloscope. Id. at 1540-41.
patent law expressly provides for patents on new uses of old products and processes. The only way to distinguish a new use of an old process from the old use of the same process is to state the new use in the claim. Good reasons thus exist to believe that existing case law, of itself, supports the rationalization of floppy disk claims by appropriate preamble limitations.

C. Legitimating Preamble Limitations by Regulation or Statute

While the legal status of a preamble limitation in a floppy disk claim is uncertain under present law, the PTO's Commissioner could significantly diminish (or even wholly eliminate) that uncertainty by appropriate rulemaking. For reasons that will be developed, the Commissioner probably has the power to resolve this matter by promulgating an appropriate regulation. In the event that this view of the Commissioner's power is incorrect, the issue can be resolved by making a comparable amendment to the patent statute.

1. Proposed Language—General Recognition of Preamble Limitations

Such a rule or statute might provide the following:

Significance of preamble limitations in certain claims

(a) A use limitation in the preamble of an article of manufacture claim for a computer-implemented invention shall be given patentable weight in interpreting the scope of the claim, including its interpretation for purposes of determining patentability over prior art, enablement, and description. Similar weight shall be accorded to statements in such claims of apparatus environment and of physical parameters of which input signals are representative.

(b) Such a claim shall not be rejected under § 102 merely because the claimed subject matter has previously been disclosed for a different use, in a different apparatus environment, or in relation to signals representative of different physical parameters.

(c) Notwithstanding subsection (b), such a claim shall be rejected under § 103 if the new use, apparatus environment, or relation to physical parameters is a departure from that which has previously been disclosed that would have been obvious to a person of ordinary skill in the pertinent art, considering the invention as a whole.

Here, subsection (a) provides that a preamble recitation of the kind of limitation that has conferred patentability on apparatus and process claims to software-related inventions should receive recognition in the interpretation of the scope of a floppy disk claim. Subsection (b) emphasizes that giving recognition to such limitations means that examiners should not reject claims to subject matter so limited as anticipated by
prior art that does not have the same limitations. 86 On the other hand, where it would have been obvious to a person of ordinary skill to refer to analogous prior art in seeking a solution to a problem, the recitation of a limitation does not turn such an obvious design choice into a patentable invention. That is as true, however, of an apparatus or process claim to a software-related invention—or for that matter, any product or process claim to any invention—as it is of a floppy disk claim. Accordingly, subsection (c) maintains the customary counterbalance of § 103 to § 102. It may seem implicit, and therefore superfluous to include this statement, but its omission might be misunderstood to imply the contrary.

That a patent claim had been examined and allowed pursuant to such a regulation would almost surely cause a court to interpret the scope of such a claim against alleged acts of infringement in the light of the limitation in its preamble. 87 The circumstances would appear to be tantamount to those of a prosecution history estoppel. 88

2. **Same Scope As Related Claims**

The proposed regulation or statute is only a first step, however, toward rationalization of floppy disk claim practice. In what specific circumstances should a floppy disk claim be allowed? The entire theory of allowing these claims is that they are needed to act as a supplement to ordinary process or apparatus claims directed to the same subject matter. For that reason, it would only be reasonable to limit their allowance to situations in which the ordinary process or apparatus claims that they supplement have previously been found allowable.

Therefore, a further regulation or statutory provision should apply to these claims in order to provide such limitations. The following is one way to formulate that requirement:

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86. As a regulation, this provision would bind examiners, not courts. But for reasons discussed subsequently, courts would be likely to interpret patents issued under the regulation in the light of the regulation. As a statute, the provision would clearly bind courts and the PTO alike.

87. The language "shall be given patentable weight in interpreting the scope of the claim, including interpretation for purposes of determining patentability over prior art, enablement, and description" is intended to be broad enough to invoke the principle that a claim should be interpreted for purposes of infringement no more broadly than it was for purposes of determining allowability. See, e.g., White v. Dunbar, 119 U.S. 47, 51 (1886); In re Donaldson, 16 F.3d 1189 (Fed. Cir. 1994).

88. See, e.g., Regents of Univ. of Calif. v. Eli Lilly & Co., 119 F.3d 1559, 1573-74 (Fed. Cir. 1997) (the doctrine of prosecution history estoppel is that statements made on behalf of a patent applicant during prosecution of the application to induce allowance of a patent estop the patentee from later making assertions of patent coverage that are inconsistent with the earlier statements). See, e.g., Ekchian v. Home Depot, Inc., 104 F.3d 1299, 1303-04 (Fed. Cir. 1997); Wang Labs, Inc. v. Mitsubishi Elec. Am., Inc., 103 F.3d 1571, 1578 (Fed. Cir. 1997).
An article of manufacture claim for a computer-implemented invention shall be allowed only if a process or machine claim has been allowed to the applicant in respect of the same disclosure. An article of manufacture claim will be allowed on a computer-readable information-storage medium or device only when the subject matter claimed in the article of manufacture claim satisfies each of the following conditions:

(1) the claimed subject matter is an encoding of the same computer program or algorithm that is implemented in the applicant's allowed process or machine claim; and

(2) each express or implied limitation as to claim scope, including, without limitation, those arising by reason of breadth of enablement, operability, description, and prior art, is made applicable to the article of manufacture claim, taking into consideration that it is an article of manufacture claim rather than a process or machine claim.

Administering such a rule could be problematic. There may be administrative burdens on the PTO, and comparable difficulties for persons studying the issued claim for purposes of avoiding infringement or determining validity, in determining whether an article of manufacture claim, as drafted, has all of the limitations of the related process or machine claim. It would be desirable to have a simple and foolproof way, preferably one by rote, to meet these requirements—a "safe haven." It is believed that this result can be realized by a substitute for the foregoing proposed regulation. The substitute would require that floppy disk claims must in effect be dependent from (by making reference to) allowed process or machine claims. This approach would automatically incorporate all limitations by reference, since that is the nature of a dependent claim. It is preferable to have applicants refer to the allowed claims than have them purport (but fail correctly) to regurgitate the full substantive content of the other claim in terms. At least, the requirement

89. In re Beauregard, 53 F.3d 1583 (Fed. Cir. 1995). In the Beauregard case, for example, there was a parent case in which apparatus and process claims were allowed. Id. But the claims in the floppy disk continuation case were worded differently, sometimes slightly and sometimes very substantially, from those of the parent case. Id. That made it very difficult to determine whether the floppy disk claims corresponded to allowable process or apparatus subject matter in the allowed claims from the parent case. Id. This kind of burden is likely to exist whenever floppy disk claims are written as independent claims. Id.

90. See 35 U.S.C. § 112 ¶ 4 (1994) ("A claim in dependent form shall be construed to incorporate by reference all limitations of the claim to which it refers."). Id.

91. A similar problem occurs whenever a dependent claim is allowable, but the base claim from which it depends is not allowable. In such circumstances, the examiner is supposed to object to the dependent claim as dependent from a non-allowed base claim and require the applicant to rewrite the dependent claim as an independent claim, incorporating into it all of the limitations found in the base and intervening claims. Ordinarily, some editing and paraphrasing is necessary to merge the claims. Human error (doubtless inadvertent) at times occurs. As has been said in another context, it can be said of such claims that "mistakes were made."
of using a dependent claim format should be imposed unless an applicant
shows good cause why that rule should not apply to the applicant's
case.92

Accordingly, the following regulation (or, in the alternative, statute)
is instead proposed for presentation of floppy disk claims in two
mandatory formats:

Mandatory format for certain article of manufacture claims

(a) An applicant may present for examination an article of manufacture
claim for a computer-implemented invention only in the formats de-
dcribed in this section, unless good cause is shown for not using those
formats.

(b) For purposes of this section and claims presented pursuant thereto,
the term "information storage medium" includes any information stor-
age device, including, without limitation, a semiconductor integrated
circuit; and the term "claim environment" means the following, if it is or
they are recited in a claim to which reference is made:

Mistakes of this kind can even lead to charges of fraud or inequitable conduct. See
Kingsdown Medical Consultants, Ltd. v. Hollister Inc., 863 F.2d 867 (Fed. Cir. 1988). In
Kingsdown, a patent attorney, when carrying a claim forward into a continuation applica-
tion, copied an incorrect, earlier version of the claim, which he had amended to overcome
an indefiniteness rejection. Id. In an en banc decision, the Federal Circuit held that under
the circumstances of the case, the negligence of the attorney in copying the language of the
claim did not manifest the specific intent to deceive the PTO requisite for a holding of
inequitable conduct. Id. Clearly, the patent system is better off when it creates fewer op-
portunities for scriveners' errors that may later affect substantive rights or, at the very
least, manufacture additional litigation issues.

92. It is conceivable that circumstances might exist in which no machine or process
claim had been allowed to the applicant, because of differences in inventorship or owner-
ship of some aspects of the invention or as a result of some kind of estoppel. For that
reason, perhaps, an applicant should be allowed to show good cause why the requirement
could not be satisfied. Of course, it would not be a showing of good cause to point out that
the inventor had been allowed only a claim on a telegraph apparatus but felt entitled to a
floppy disk equivalent of a claim to the use of electromagnetic force for transmitting intelli-
gible characters at any distance.

By way of comparison, the 1995 Biotechnological Process Patents amendment to § 103
of the patent code, adding a new subsection (b), provides that the otherwise obvious process
claim now allowed under this subsection must occur in the same patent application or in
one having the same effective filing date, as the related, nonobvious composition of matter;
and the two applications must be commonly owned. 35 U.S.C. § 103(b)(1)(A)-(B) and (2)(A)-(B)
(1994). Moreover, the claims must issue in the same patent or ones having the same
expiration dates. Id. The purpose of these provisions is different from that of the instant
provision, although the purposes of § 103(b) perhaps deserve attention here. Id. The limita-
tions of § 103(b) are clearly intended to prevent extension of the duration of a patent
monopoly by double patenting and to limit harassment of potential defendants by multiple
patent owners. Id. Prof. Thomas refers to § 103 as attempting to "solve claiming problems
by bludgeon." Thomas, supra note 10. Perhaps, the "bludgeoning" criticism could be lev-
eled at article of manufacture claims for computer programs, as well. Id. The intent of my
proposal, however, is to provide something of a safety helmet against the bludgeon.
(1) the intended use of the subject matter of the claim to which reference is made;

(2) the apparatus environment of the subject matter of the claim to which reference is made; and

(3) the physical parameters of which input signals to the subject matter of the claim to which reference is made are representative.

c) The following format may be used when reference is made to an allowed apparatus claim: An information storage medium encoded with machine-readable computer-program code, to be used, in the claim environment of [apparatus] Claim A, for implementing the following means of Claim A [names for elements are illustrative only]:

   said first means;
   said means for adding;
   said multiplier means; and
   said subtraction means.

(d) The following format may be used when reference is made to an allowed process claim: An information storage medium encoded with machine-readable computer-program code, to be used, in the claim environment of [process] Claim P, for carrying out steps m to n of Claim P.

Here, Claims A and P are to be understood as allowable apparatus and process claims, where the claimed subject matter utilizes an algorithm to carry out the patentable process or apparatus. Immaterial variations in wording, such as an introductory phrase of the kind “an article of manufacture comprising” or “an article of manufacture essentially consisting of,” would be unobjectionable. The point is that claims in this format are to guarantee no difference in substance as to the scope of use between the article of manufacture claim and a related process or apparatus claim on which it purports to be based.\(^9\)

The two formats proposed would lead to floppy disk claims that have the same scope and limitations as the allowed, related machine and process claims, taking into account that a claim according to the prescribed format is directed only to the portion of the system involved that is a computer program encoded on a storage medium. These formats would not cover unenabled, undescribed uses or uses outside the environment that conferred patentability on the antecedent machine and process claims to which they relate. Accordingly, the proposed formats would

\(^9\) A further advantage of such claims would be that the examiner would not need to spend any time examining them. Such a claim should be allowed as a matter of course. Thomas, supra note 10 (quoting claims from a 1995 patent that are drafted in essentially this format reads, “Claim 15. A program storage device readable by machine, tangibly embodying a program of instructions executable by the machine to perform the method steps of Claim 13.”).
appear to solve the scope problems that floppy disk claims would otherwise cause.

While this discussion has referred to this type of claim as a dependent claim, strictly speaking it is not a dependent claim. It does not contain all the elements or limitations of the claim to which it refers, since it is really directed to only a part of the entire system—the part embodying the relevant computer program. However, as formulated here, the floppy disk claim cannot be infringed by a use, or a manufacture or sale or offer to sell for a use, other than that which will occur when the independent base claim is infringed. The proposed claim format is akin to that of a "hybrid" claim on the product of a process. In both cases, the later claim refers to an allowed base claim, and the base claim limits and describes the subject matter of the later claim in much the same way as the preamble of a Jepson claim limits the scope of the rest of the claim.

3. Extrapolation to Propagated Signals

It may be premature to address the same problem in terms of propa-

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94. Consider an invention of a notional gasoline engine, which is the subject of notional Claim 1. This engine has greatly superior functionality (more complete conversion of fuel into mechanical energy and less production of pollutants) because it combusts gasoline vapor divided into smaller size particles than previously used. A conventional carburetor can be modified to produce the smaller particle just by decreasing the diameter of an orifice. Other structural modifications of the engine involve a different piston shape and a hotter spark plug, and the engine of Claim 1 has such limitations.

A carburetor for use in the engine might be claimed in reference to the engine, somewhat like certain European pharmaceutical claims ("for use in the engine of Claim 1"). This carburetor would not literally have any of the piston or spark plug limitations of the engine, because a carburetor contains no pistons or spark plugs. Nonetheless, the carburetor claim would not be infringed by use of a narrow-orifice carburetor with an engine different from that of Claim 1, such as an engine with different pistons or spark plugs. The situation is comparable to that of the floppy disk claim format proposed in this article.


97. Id. Claims in this format may be compared, also, with the claims that 35 U.S.C. § 103(b) authorizes. Id. That provision meets the special needs of the biotechnology industry. See supra note 92. Subsection (b) addresses a well-known biotechnology process that has been adapted to use a novel, nonobvious starting product, or to produce a novel, nonobvious end product. 35 U.S.C. § 103(b) (1994). Before enactment of § 103(b), the adapted process would have been held obvious. Id. Under § 103(b), if such a product is patentable so too is the process, as adapted for the new product. Id. The present proposal for floppy disk claims reflects an inverse situation: where a computer-implemented process is patentable, a conventionally encoded conventional floppy disk used to carry out the process becomes patentable, as adapted.
gated signal claims. So far, they seem to be purely hypothetical. However, possible claim formats are like Mount Everest to patent attorneys. That they might be there is enough to present a challenge. It is therefore worth considering, at least tentatively, whether the preceding mechanisms would help limit the possible overbreadth of such claims.

If anything, the overbreadth problem is potentially more serious for propagated signal claims than it is for claims directed to a tangible storage medium or device. At least in some instances, the nature of an application places limits on the range of equivalents that a tangible medium claim would receive. It has already been suggested, for example, that a pattern recognition algorithm may be enabled for a check verification system by a floppy disk disclosure and not be enabled for space vehicle navigation purposes by the same disclosure. This kind of consideration might well lead a court to limit the scope of a floppy disk claim enabled by a floppy disk disclosure to applications using floppy disks and similar slow, non-rugged media, even absent the claim format requirements that this article proposes. But it is not clear that the kind of environment or field of use constraints that might limit the enablement and scope of a tangible medium claim will apply to a signal. It may be that “a signal is a signal,” in that they all look alike.

Recognition of propagated signal claims could thus cause significantly greater damage to the balance between enablement and claim scope that existing patent law provides than floppy disk claims. Signal claims bring us much closer to Morse’s Claim 8—speaking literally—than other claim formats have done. By the same token, it is even more important that limitations akin to those proposed for floppy disk claims should apply to propagated signal claims.

If we are to have propagated signal claims, then, they should be limited in terms to the environment of the apparatus or process claims on which they are based, and thus to the enabling disclosure behind them. Accordingly, if a signal is to be deemed in the same category as an “information storage medium” for purposes of article of manufacture claims to computer software, the required formats of paragraphs (c) and (d) proposed earlier should govern them too. Imposing that format requirement on propagated signal claims would go far to remove the risk of overbreadth that signal claims would otherwise pose.

98. See supra text accompanying notes 12-19.
99. See supra text accompanying note 70.
100. See Micro Chem., Inc. v. Great Plains Chem. Co., 103 F.3d 1538, 1547 (Fed. Cir. 1997) (holding that no patent infringement occurred where patent specification disclosed one structure and accused machine had a “significantly different” structure).
101. See supra text accompanying and subsequent to note 90.
D. RULEMAKING OR LEGISLATION?

A remaining question is whether what has been proposed here for the rationalization of floppy disk claims can be accomplished through the Commissioner's rulemaking power or must instead be the subject of a statutory amendment. Analysis of this question has several branches. A first branch is whether the Commissioner could properly decline to examine article of manufacture claims unless they were in the proposed format. A second branch of the question is whether the Commissioner has power to allow such claims. Stated differently, the proposed regulations invite the questions of whether they go too far and whether they do not go far enough in allowing article of manufacture claims.

Two precedents have a substantial bearing on the questions. In Steinmetz v. Allen, the Supreme Court invalidated a patent office rule against combining method and apparatus claims in the same patent application. The Court found the requirement irrational and therefore struck it down. In Application of Tarczy-Hornoch, the predecessor of the Federal Circuit struck down the patent office's rule against allowing process claims to the inherent function of a patented machine that was covered by an allowable apparatus claim. In both cases, the reviewing court considered the patent office's rule irrational in terms of applicable substantive law.

Thus, one determinative question is whether existing substantive patent law allows a patent to a computer program article of manufacture claim where the law would not allow a corresponding apparatus or process claim. If it does, the proposed regulation does not go far enough, and an applicant denied a claim because of the proposed regulation would have a legitimate grievance. Presumably, the Federal Circuit would then overturn (at least, vacate) a rejection based on the regulation.

No one has suggested that an article of manufacture claim should be allowed except as an adjunct to and supplement for an allowable apparatus or process claim. Such moderation in the demands of enthusiasts for such claims seems warranted, to say the least. For example, deci-

104. Of course, in the case of a statute no such issue arises. See Graham v. John Deere Co., 383 U.S. 1, 6 (1966) (stating that Congress is free to legislate short of the maximum established by the Constitution). The Constitution gives Congress the power to enact patent legislation but does not compel Congress to exercise the power in any particular way or to any particular extent, so long as Congress acts within the limits of that grant. U.S. CONST. art. I, § 8, cl. 8. See also White-Smith Music Publ'g Co. v. Apollo Co., 209 U.S. 1 (1908); Wheaton v. Peters, 34 U.S. (8 Pet.) 591 (1834) (providing comparable rulings as to copyright laws).
105. See, e.g., Siber and Dawkins, supra note 5, at 260-61.
sions such as *In re Gulack* make it clear that a claim to an article whose sole novelty is the information embodied in the article must, to be patented, rest on a novel, nonobvious interaction between the old substrate and the new information. The only new result claimed for the subject matter of floppy disk patents is that they make a computer system operate in a novel, nonobvious way. The grounds for patentability of the floppy disk and the computer apparatus or the computer process are thus the same. There is no reasonable substantive basis for allowing a floppy disk claim to a supposed invention that does not qualify for patenting as an apparatus or process. For that reason, it seems fair to conclude that the proposal does not fall short of the full proper scope that article of manufacture claims deserve under present law.

The first branch of the analysis thus leads to the conclusion that the Commissioner would be justified in refusing to grant claims to articles of manufacture where no corresponding apparatus or process would be patentable. The only question on judicial review of the rule—say, on a direct appeal of a rejection based on the rule—then would be whether the proposed rule has a reasonable relationship to the foregoing principle of law. Clearly, it does.

To be sure, other means for complying with present law might be devised. But the Commissioner may promulgate any regulations “not inconsistent with law” relating to how proceedings shall be conducted before the PTO. As long as the regulations are not inconsistent with law, it is immaterial that other possible formulations of the regulations would also be not inconsistent with law. It is enough that the Commissioner’s rules are not arbitrary or capricious, or otherwise “in excess of statutory authority.” Regulations will be sustained so long as they are “reasonably related to the purposes of” the underlying legislation. That test is met here.

The second branch of the question—whether the proposal goes too far—is more problematic. It may be that such article of manufacture claims are necessarily invalid under § 101 or § 103. When the comparable question arose for biotechnology inventions—manufacture of a new product by adapting a known process or manufacture of a new or known product by adapting a known process to use of a different and novel starting material—the controversy was resolved only by amending the

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106. *In re Gulack*, 703 F.2d 1381 (Fed. Cir. 1983).
107. See *Guidelines*, supra note 4 (whether my proposal goes too far, and whether the PTO’s *Guidelines* go too far, are separate questions).
112. *Ethicon*, 849 F.2d at 1425.
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statute to obviate the obstacles in existing law. This article does not attempt to resolve the fundamental question of whether article of manufacture claims for computer program subject matter are inherently misconceived. That is the subject of a different contribution to this symposium. Without purporting to resolve that issue, this article simply preempts the question and awaits the learning to be gained from the contributions of others to this symposium. As stated at the outset, it is assumed here, arguendo, that some kind of article of manufacture (floppy disk) claim would be lawful; this analysis addresses only the question—what kind of claim should it be or would it have to be. This article has set out to determine the problems, other than that of statutory subject matter and related issues of policy, that floppy disk claims pose, and then seek solutions to each of them.

For these reasons, it is concluded that promulgating the two regulations proposed here are within the Commissioner's rulemaking power. The proposed regulations simply restate the present state of law and give a reasonable mechanism for complying with the law's requirements. If I am incorrect in this analysis, nonetheless, Congress clearly has the power to enact such legislation. The Constitution neither requires Congress to go farther than these proposed regulations or statutory provisions, nor does it withhold from Congress power to enact them. If one assumes that there should be floppy disk claims of some kind, the Guidelines proposed here for their format appear most likely to ensure that granting floppy disk claims will do minimum damage to the other goals of the patent system.

IV. CONCLUSION

Floppy disk claims can be rationalized in a manner that overcomes the O'Reilly v. Morse problems that claims in this format tend to create. The rationalization is accomplished by importing into floppy disk claims the same kind of limitations that courts have held confer patentability on machine and process claims directed to software inventions. While floppy disk subject matter may resist imposition of such limitations, given that a floppy disk does not "care" what problem a computer uses the program encoded on the disk to solve, the necessary limitations can be imposed on floppy disk claims by regulatory or legislative fiat. A mechanism for doing that has now been proposed. It is believed that the proposed mechanism would further the public interest in avoiding overbreadth, because it makes the scope of such claims substantially equivalent to that of allowable process or apparatus claims on which

113. Thomas, supra note 10.
114. Animal Legal Defense Fund v. Quigg, 932 F.2d 920, 927 (Fed. Cir. 1991) (administrative agency's rule-making authority as "interpretative" rather than "substantive").
they are based. It is also believed that the proposed format requirements will result in minimizing the administrative and interpretative problems that floppy disk claims would otherwise cause for the PTO and the business community.