4 Tex. Intell. Prop. L.J. 71

Texas Intellectual Property Law Journal
Fall, 1995

Note

GENERAL DOES NOT MEAN GENERIC--SHEDDING LIGHT ON IN RE ALAPPAT

Jonathan N. Geld[a1]

Table of Contents

I.	Introduction	71
II.	*In re Alappat*	72
III.	History	74
IV.	Equivalents	77
	A. Equivalence Analysis Using Section 112 Paragraph 6	77
	B. Doctrine of Equivalents Analysis	79
V.	Recent Developments	81
	A. *In re Trovato* (1994)	81
	B. Proposed Examination Guidelines for Computer-Implemented Inventions	83
	C. *In re Trovato* (1995)	84
VI.	Conclusion	85

I. Introduction

The recent Federal Circuit decision in *In re Alappat*[1] has generated a great deal of press regarding the scope of software patenting.[2] The popular (and not so popular) press has focused on the portion of the majority opinion which stated that "a general purpose computer in effect becomes a special purpose computer once it is programmed to perform particular functions pursuant to instructions from program software."[3] While this statement is open to philosophical debate, it is hardly a new one. A look at the history of software patenting needs to be made in order to assess its current validity. This history also shows the state of software patenting prior to the *Alappat* decision. By analyzing the history of software patenting we can determine where we stand today and whether the furor over the *Alappat* decision is warranted.

***72** Since the statement seems to be dropped into the opinion without much warning, it will also be helpful to try to determine the court's reasoning behind what appears to be such a bald assertion. Standard equivalence analysis using 35 U.S.C. § 112 para. 6 techniques as well as the doctrine of equivalents will be applied to Alappat's claims. It will be shown

that in order for the equivalence that the court asserts to be valid and still be patentable subject matter, the court necessarily had to limit the actual scope of what a general purpose computer was by applying hardware restrictions upon the term. The intent of this paper is to clarify the importance attached to this portion of the opinion and to put the decision in its place as a natural extension of previous opinions and proper equivalence analysis.

II. *In re Alappat*

The invention addressed in *In re Alappat* was a rasterizer, an electronic device that converts waveform magnitude data into intensity data usable to create a smooth waveform display on an oscilloscope screen. Claim 15, which was at issue, disclosed "[a] rasterizer 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."[4] The claim further disclosed the means which comprise the rasterizer:

> (a) means for determining the vertical distance between the endpoints of each of the vectors in the data list; (b) means for determining the elevation of a row of pixels that is spanned by the vector; (c) means for normalizing the vertical distance and elevation; and (d) means for outputting illumination intensity data as a predetermined function of the normalized vertical distance and elevation.[5]

Alappat disclosed in claims 16-19 the structure relating to the means in claim 15 as being: (a) an arithmetic logic circuit (ALU) configured to perform an absolute value function; (b) another arithmetic logic circuit configured to perform an absolute value function; (c) a pair of barrel shifters; and (d) a read only memory (ROM) containing illumination intensity data.[6]

The claim was rejected by the examiner on the grounds that it was a non-statutory mathematical algorithm. A three-member panel of the Board of Patent Appeals and Interferences reversed, indicating that although the claim recites a mathematical algorithm, it was directed to a machine (via the structures disclosed in the specification applied through 35 U.S.C. § 112 para. 6) and thus statutory subject matter under 35 U.S.C. § 101.[7] The examiner requested reconsideration by an expanded panel on the ***73** grounds that the Board decision contradicted the policy of the Patent and Trademark Office (PTO). The Commissioner complied and assembled an eight-member panel which contained the members of the original panel plus the five members who eventually wrote the new majority opinion reversing the original panel's decision.[8] The panel indicated that PTO policy was to interpret means-plus-function clauses in claims broadly, without imputing limitations from the specification into the claims.[9] The panel did not consider the structure corresponding to the specification set up in claims 16-19 because those claims were not before the panel, having not been argued by Alappat. Thus, the expanded panel interpreted claim 15 to be a process claim having steps that combined to form a mathematical algorithm for computing pixel intensity information.[10]

The first portion of the Federal Circuit's decision deals with the validity of the use of the expanded panel and, thus, whether it had issued an appealable decision over which the court had jurisdiction to review.[11] The court initially determined that it had jurisdiction and that there were no violations made by the Commissioner or the panel, then proceeded to address the merits of the case.

The court began its substantive analysis by characterizing claim 15 and dependent claims 16-19 as a machine comprised of known electronic circuitry elements and therefore patentable subject matter under 35 U.S.C. § 101.[12] The court indicated that in interpreting claim 15, the restrictions set up by Alappat in the specification also must be considered. The specification defined a structure which limited the scope of claim 15 to a machine functioning as a rasterizer comprised of the elements specified in both the specification and claims 16-19.[13]

The court also rejected the expanded panel's ruling that the subject matter falls within the mathematical algorithm exception. The court stated that precedent held that a mathematical algorithm which represents nothing more than an abstract idea is not eligible for patenting.[14] The court felt that Alappat's invention clearly did not fall within this category. The combination of elements claimed by Alappat in claims 15-19 was not considered to be an abstract idea, but, as already indicated, a "machine."[15] Further, the court found that claim 15 is "limited to the use of a particularly claimed ***74** combination of elements performing the particularly claimed combination of calculations to transform, i.e., rasterize, digitized waveforms (data) into anti-aliased, pixel illumination data to produce a smooth waveform."[16] Thus, the court took the invention out of the mathematical algorithm exception and brought it within precedent requiring that a claim to an algorithm could not be so

broad that it would "'wholly preempt' the use of any apparatus employing the combination of mathematical calculations recited therein."[17]

Having found that the claims were so limited, the court appeared to then take an about-face in the last two paragraphs of the majority opinion. The court stated that it agreed with Alappat's contention that claim 15 would read on a general purpose computer programmed to carry out the claimed invention.[18] Here, Judge Rich indicated that when a general purpose computer is programmed, it becomes a new machine, a special purpose computer, set up to perform the tasks defined by its programming.[19] Thus, he said, "a computer operating pursuant to software *may* represent patentable subject matter, provided, of course, that the claimed subject matter meets all of the other requirements of Title 35."[20] These statements by the majority are what have been focused on by the popular press. Since it is not clear from the opinion where these propositions come from, a look at some history is in order.

III. History[21]

Similar wording regarding the equivalency of general purpose computers to machines was originally used in *In re Bernhart* in 1969.[22] Earlier that year, in *In re* ***75** *Prater,*[23] it also had been implied that analog machine implementations may be expanded to general purpose digital computers. These two cases, and cases that are subsequent to these but prior to *Gottschalk v. Benson,*[24] were searching for a way to remove computer algorithms from the mental-steps doctrine by confining the application of the algorithm to machines, thus reducing the argument that a patent would stop people from thinking out the steps in their minds.

Gottschalk v. Benson, decided in 1970 by the Supreme Court, took away much of the progress that had been made by the Court of Customs and Patent Appeals (CCPA) with regard to software patenting.[25] The Court apparently rejected the holdings of *Prater* and *Bernhart* by saying that algorithms are all mentally performable and thus fall under the mental-steps restriction of the patent statutes.[26] Going beyond the mental-steps doctrine, the Court also looked at the practical application of the algorithm and indicated that since its only practical application was on a computer, any grant of a patent would wholly preempt its use.[27] Since *Benson* had the effect of rejecting the previous cases, the "new and different machine" philosophy also would seem to have been rejected.

However, the CCPA and the PTO continued to resurrect the "new machine" language, although never basing a decision outright upon the reasoning. Primarily, the language was being used in conjunction with formulating the algorithm claims as apparatus claims in order to get around the restrictions in *Benson.* The CCPA favored an approach by which the *Benson* holding was limited to method claims, and thus was more lenient than the PTO with respect to apparatus claims (the PTO favored a more literal reading of the Supreme Court ruling in *Benson*). Conflicting interpretations between the CCPA and the Supreme Court continued with regard to the *Parker v. Flook*[28] case. The Supreme Court felt that if the point of novelty was the algorithm, then a patent should not issue. That is, the program should be treated as part of the prior art, and the rest of the claim should be examined for novelty.[29] The CCPA did not follow this decision in subsequent cases, preferring to focus on whether an algorithm was involved in the claim and whether patenting the algorithm would wholly preempt its use.[30]

***76** The *Diamond v. Diehr* case gave the Supreme Court an opportunity to clarify its ruling in *Benson* and also to allow it to open the door to greater patenting of software.[31] The invention, phrased as an industrial process claim, allowed the Court to focus on the transformative nature of the invention as a whole and not the algorithm portion alone. By using this concept, the Court allowed the possibility of later interpretation by the Federal Circuit in *Alappat* to discuss the transformative nature of a computer program upon the processor running it. The *Diehr* holding is otherwise significant because the Court acknowledged that the point of novelty in this claim was the algorithm itself. But, the algorithm could not be taken out of context (if it were, the invention would no longer be novel), and the result of combining the steps was important.

The next step toward the resurfacing of the "new machine" language occurred in the Federal Circuit decision of *In re Iwahashi.*[32] Here the court used the reasoning in *Diehr* to hold that the claim should be considered as a whole, and given that context, there was no reason why a system of computer speech pattern recognition should not be considered a patentable process. The court emphasized the form of the claims; with the exception of one claim, all were worded in "means-plus-function" form, which is allowed by 35 U.S.C. § 112 para. 6. The one claim that was not in means-plus-function form addressed a step involving a ROM lookup table (the PTO later focused on this as the important part of the holding). The statute states that such claims "shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof."[33] The equivalents language becomes very important when considering how the court in *Alappat* arrived at its expansive language.

The Federal Circuit continued to expand patentability of software with the 1992 decision of *Arrhythmia Research Technology, Inc. v. Corazonix Corp.*[34] Here the court held that while claims directed to an abstract mathematical equation were not patentable for all the historical reasons, "claims to a specific process or apparatus that is implemented in accordance with a mathematical algorithm" will be permissible.[35] Thus, the court reiterated the need for a narrowly framed claim when attempting to patent an algorithm. The process claims of the invention did not wholly preempt the procedures but were limited to the scope of the invention. The ruling with regard to the apparatus claims is important for analysis of the *Alappat* ruling. The apparatus was claimed using 35 U.S.C. § 112 para. 6 language. The purpose of the computer-performed operations was to convert an input signal into a different output signal, and it was able to do that because the internal structure of the processor was set up by the ***77** algorithm. Thus, the configured processor became part of the combination of interrelated means to perform the task of the invention. By using reasoning with regard to how the processor has been altered to perform its task, the court opened the door to the next logical step, which was *Alappat.*

IV. Equivalents

The general purpose microcomputer language of *Alappat* arises because the court equates a set of hardwired circuitry designed to perform a specific task (smoothing out the lines on an oscilloscope display) to a general purpose computer programmed to do the same task. That is, the hardwired circuitry is viewed as a black box that receives an input and generates an output. The programmed general purpose computer is seen as another black box that produces the same output from the same input as the hardwired circuit. Thus, the processes are determined to be equivalent.

In evaluating equivalence, the court may use two paths of analysis. First of all, Congress included equivalents language in 35 U.S.C. § 112 para. 6 when it defined the means-plus-function form of claims:

> An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the *corresponding structure, material, or acts described in the specification and equivalents thereof.*[36]

The court may also use the judicially-constructed doctrine of equivalents, which inquires as to whether substantially the same overall function or work is done in substantially the same way to obtain substantially the same result.[37] Since the opinion is not clear as to which method the court used to arrive at its conclusion regarding the equivalence of a general purpose computer to Alappat's invention,[38] both methods should be investigated.

A. Equivalence Analysis Using Section 112 Paragraph 6

The Federal Circuit explains the application of both section 112 para. 6 and the doctrine of equivalents in its decision in *Valmont Industries, Inc. v. Reinke Manufacturing Co.*[39] In qualifying the breadth of means-plus-function claims, the court indicates that function claims must be limited to structures, materials, or acts in the ***78** specification.[40] The court says that the structure claimed to do a specific task should be the focus of the inquiry.[41] For equivalence under section 112 para. 6, "the accused device must employ means identical to or the equivalent of the structures, material, or acts described in the patent specification. The accused device also must perform the identical function as specified in the claims."[42] In other words, a device will be found equivalent if the change is insubstantial and adds nothing of significance to the structure, material, or acts of the original device.[43]

Alappat's disputed claim 15 sets up the means-plus-function language defining the oscilloscope rasterizer. Claims 16-19 define the underlying structures of claim 15's various parts.[44] The claimed means for determining the vertical distance between the endpoints of vectors in the data list is an arithmetic logic circuit configured to calculate absolute values. The means for determining the elevation spanned by a vector is another arithmetic logic circuit which also is configured to calculate absolute values. A pair of barrel shifters is the structure behind the means for normalizing the vertical distance and elevation values. Finally, a read-only memory (ROM) containing illumination intensity data is used as the means for outputting.[45] Thus, physically, the structure that limits Alappat's claim consists of arithmetic logic units, barrel shifters, and a ROM.

A general purpose computer will not necessarily be physically similar in structure to Alappat's claim. Complexity, flexibility, speed of computation, and manufacture are all differences which may arise between the general purpose computer and the Alappat circuitry. The court appears to acknowledge this limitation by qualifying its definition of a "general purpose

computer" by suggesting that ALUs, ROMs, and shift registers are all common elements of digital computers.[46] By adding this qualifier, the court is clearly limiting the scope of general purpose computers to those that are structurally similar to the computer in Alappat's claim. If it had not done so, then the court would have had to look elsewhere for underlying structure to find equivalence.

The court could not have construed the claim as broadly as Alappat argued for in his brief, as recounted by Chief Judge Archer in his dissent.[47] Alappat pled for a broad recognition of equivalence because a circuit designer (and presumably a programmer) ***79** could design around claims limited to two ALUs, two barrel shifters, and one ROM. The problem with such a broad claim is that the court must then look beyond the physical hardware to find equivalence. That the two physically dissimilar circuits accomplish the same task relies on their following the same algorithm, which is a set of mathematical manipulations. If we allow the two to be called equivalent, then they can only be equivalent because the claimed invention is, in reality, a mathematical manipulation. Thus, the structure claims in Alappat's claims 16-19 could not help but be mere form over the actual substance of the invention, which is the mathematical manipulation. As Chief Judge Archer indicates in dissent, this claim would be a sham which could not be patentable subject matter.[48] The majority avoids this problematical area by restricting the scope of general purpose computers to those with similar structure to the claimed invention. Unfortunately, the majority downplays the importance of this restriction by relegating it to a footnote.[49]

B. Doctrine of Equivalents Analysis

In addition to the statutory construct of equivalents in section 112 para. 6, the courts may also use the judicially constructed doctrine of equivalents. Under this doctrine, if an accused device performs substantially the same overall function or work, in substantially the same way, to obtain substantially the same overall result as the claimed invention, it will be considered to infringe upon the claimed invention.[50] Structural and functional limitations of the claimed invention must be taken into account when determining whether an accused device infringes. These limitations avoid expanding the scope of a patented invention beyond that originally claimed and set out by the patent.[51] Where the equivalents in section 112 para. 6 apply only to the single means in the accused device, the doctrine of equivalents looks at the entirety of the accused device in determining "substantial" equivalence.[52] Failing the doctrine of equivalents test means that the accused device results from an insubstantial change which, from the perspective of a person of ordinary skill in the art, adds nothing of significance to the claimed invention.[53] While section 112 para. 6 equivalents is looked upon as limiting means-plus-function claims to equivalents of structure, materials, or acts, the doctrine of equivalents is generally looked upon as expanding exclusive patent ***80** rights.[54] Thus a device which is not equivalent under the statutory test may be equivalent under the doctrine of equivalents.

Although an action for infringement has not been brought against Alappat's device, a hypothetical general purpose computer programmed to function as Alappat's device can be used to analyze a hypothetical infringement case using the doctrine of equivalents. The first prong of the doctrine of equivalents tripartite test is whether the accused device does substantially the same work as the claimed device. Alappat's rasterizer circuit is designed to perform some manipulations on data based upon vector lengths between points on an oscilloscope screen and then to adjust the intensity level of the points displayed on the screen. A general purpose computer can be programmed to perform the same function and replace the circuit in the oscilloscope. Therefore, the general purpose computer passes the function portion of the test. Likewise, substituting the general purpose computer for the rasterizer circuit would give substantially the same result (the third prong of the test), that is, curves on the oscilloscope screen that appear to be smooth. If it did not give the same result, then there would be no substitution and this analysis would be unnecessary.

The problem arises in the second part of the doctrine of equivalents test, that is, does the accused device function in substantially the same way? In the abstract, a general purpose computer will not necessarily do its manipulations on data in the same way as Alappat's ALUs, shift registers, and ROM. Once again, the majority's qualification laid out in footnote 26 becomes important.[55] By specifying that the computer have ALUs, shift registers, and a ROM, the majority forces the general purpose computer to function in the same way that Alappat's claimed invention functions. Without this restriction, the issue would be that the general purpose computer performs the function in the same way because the actual function is a mathematical manipulation which is being given rather broad scope. As Chief Justice Archer said, "To find equivalence based solely on the identity of the mathematical function, with absolute disregard for the particular claimed circuitry is to concede that Alappat's claimed circuitry is irrelevant and non statutory."[56] Thus, to satisfy the doctrine of equivalents, there must be hardware restrictions placed upon the general purpose computer.

***81 V. Recent Developments**

Since the *Alappat* decision was rendered, a Federal Circuit panel in *In re Trovato*[57] had the opportunity to hear a software patent case which used a means-plus-function form for some its the claims. During the summer of 1995, the PTO issued a request for comments on Proposed Examination Guidelines for Computer-Implemented Inventions, incorporating some of the issues presented in *Alappat*.[58] In light of those proposed guidelines and the *Alappat* decision, the Federal Circuit issued a per curiam decision vacating and remanding its earlier decision in *Trovato*.[59]

A. *In re Trovato* (1994)

The *Trovato* applications involved an invention for determining the shortest distance between two points given a certain set of conditions.[60] The task was to navigate through a configuration space that included obstacles and varying costs for traveling through a particular area.[61]

The first application contained both method claims and apparatus claims. Claim 33 was presented as a representative example of the apparatus claims:
Apparatus for planning a least cost path comprising:

a) means for storing a discretized representation of a physical task space;

b) means for assigning at least one respective cost to at least one neighboring position of any given position, based on
i) a cost assigned to the given position; and

ii) a measure which varies according to position within the discretized representation, so that a least cost path from the neighboring position to the given position is established;

c) means for starting the assigning means at a first position of known cost;

d) means for causing the assigning means to iterate, so that all positions within the discretized representation are assigned respective costs, in waves propagating outward from the first position; and

e) means for identifying a least cost path between two positions in the discretized representation based on respective costs.[62]
***82** The examiner rejected the method and apparatus claims as nonstatutory subject matter under 35 U.S.C. § 101, concluding that "the claims did not involve physical structure or process steps beyond insignificant data-gathering steps or post-solution output."[63] The Board of Patent Appeals and Interferences upheld the rejection of most of the claims as an indirect recitation of a mathematical algorithm.[64] Similarly, the examiner rejected and the Board affirmed the rejection of the claims in the second application as indirectly reciting a mathematical algorithm.[65]

On appeal, Trovato argued to the Federal Circuit that the claimed invention solved a physical, not a mathematical, problem.[66] The contention was that the claimed data structure was "a physical entity, consisting of electrical or magnetic signals and requiring interaction between the processing and memory apparatus of a computer."[67] The court found that the invention merely was a systemic way of manipulating the numbers characterized by the data structure and thus a mathematical algorithm.[68] Further, the court found that the specifications in the applications recited no underlying physical process, no computer architecture, no circuit diagram, and no more than a brief mention of hardware.[69]

The court confirmed the previously-discussed importance of underlying physical structure in software claims. Referring to *Alappat,* the court indicated that they "extensively relied upon the hardware listed in the specification, including arithmetic logic units, barrel shifters and a read only memory in reaching the result that the claimed invention constituted patent eligible subject matter."[70] In reviewing Trovato's application, the court found no disclosure of a machine:

> [W]e can discern no disclosed apparatus provided in the specifications as suggested in the various claim preambles. Further, all the disclosed means are simply software instructions; no "structure" appears in the specification as required under § 112, ¶ 6. Although Trovato points to "signals" drafted in some of their

> claims, indicating the electrical signals internally transmitted by a computer as part of its solution of the budding process, the mere noting of "signals" does not transform their inventions into statutory subject matter under the circumstances presented here.[71]

***83** Thus, the court reinforced that the lack of an underlying physical structure to a software claim will be fatal to its patentability. Indeed, in doing so, the court pulled this critical aspect of software patenting under *Alappat* out of an obscure footnote and into the spotlight.

B. Proposed Examination Guidelines for Computer-Implemented Inventions

The proposed guidelines governing the internal practice of the PTO in reviewing patent applications on computer-implemented inventions were published during the summer of 1995 with a comment period extended to September 25, 1995. As the PTO states in the Supplementary Information:

> The following guidelines have been developed to assist Office personnel in their review of applications drawn to computer-implemented inventions. These guidelines respond to recent changes in the law that governs the patentability of computer-implemented inventions, and set forth the official policy of the Office regarding inventions in this field of technology.[72]

The text of some of the provisions reveals that some of the "changes in the law" referred to in the guidelines are from the *Alappat* decision.

The section on *Procedures to Be Followed When Evaluating Computer-Implemented Inventions* is to be used during examiners' review of applications. The first step calls for the examiner to review the written description and the claims. The examiner is called upon to:

> Analyze each claim carefully, correlating each claim element to the relevant portion of the written description that describes that element. Give claim elements their broadest reasonable interpretation that is consistent with the written description. *If elements of a claimed invention are defined in means plus function format, review the written description to identify the specific structure, materials or acts that correspond to each such element.*[73]

As called for in *Alappat,* the examiner is instructed to go to the specification to identify the structure associated with the software claims. The guidelines also propose the following presumptions be made for classifying claims into statutory categories:

(i) A computer or other programmable apparatus whose actions are directed by a computer program or other form of "software" is a statutory "machine."

(ii) A computer-readable memory that can be used to direct a computer to function in a particular manner when used by the computer is a statutory "article of manufacture."

(iii) A series of specific operational steps to be performed on or with the aid of a computer is a statutory "process."[74]

***84** Calling a computer which is directed by software a "machine" not only reinforces *Alappat,* but also harkens back to the language used by the CCPA in *Bernhart.*

The examiner is then called upon to analyze each claim in order to determine compliance with 35 U.S.C. § 112 para. 1 and para. 2.[75] Underlying structure, materials or acts are critical to claims defined using means-plus-function language. The guidelines instruct the examiner to reject such claims if it is unclear whether the means element corresponds to the underlying structure, materials, or acts.[76] Such a rejection shifts the burden to the applicant to describe what specific structure, materials, or acts correspond to the means element and to identify the precise location in the specification where the description of the means element may be found.[77] This is consistent with both the *Alappat* and the *Trovato* decisions. In addition, to determine whether claims are supported by enabling disclosure, the examiner is instructed to construe means-plus-function claims to

"encompass all reasonable equivalents of the specific structure, material or acts disclosed in the specification corresponding to that means element."[78] This would seem to conform with the *Alappat* concept of equating hardwired circuitry designed to do a particular task with a general purpose computer programmed to do the same task, as long as certain structural elements are present.

It should be noted that these guidelines were published as a "Request for Comments" and as such are not necessarily being followed by examiners at the PTO. However, they do give a good indication of what the future holds for software examination. It should also be noted that the guidelines discussed above are only a portion of the published guidelines and were chosen for their topical relevance.

C. *In re Trovato* (1995)

In July, 1995, the Federal Circuit issued a per curiam opinion regarding an en banc rehearing of the *Trovato* (1994) decision.[79] Trovato had challenged the earlier panel decision in light of the *Alappat* holding that a computer operating pursuant to software may be patentable subject matter.[80] The court found that not only may *Alappat* be controlling, but also, to the consternation of the dissenters, that the *Proposed Examination Guidelines for Computer-Implemented Inventions* may be of impact as well.[81] Thus, the court vacated the *Trovato* (1994) judgment as well as the ***85** Board of Patent Appeals and Interferences decisions. The court then held that "the case is remanded for reconsideration in light of *Alappat* and any new guidelines adopted by the Patent and Trademark Office for examination of computer-implemented inventions."[82]

The dissenters, Judges Nies and Michel, who were two-thirds of the *Trovato* (1994) panel, expressed concern for the "unconventional" action of the majority in vacating and remanding a case in which neither Trovato nor the PTO had requested a remand.[83] In addition, the dissent felt that reliance on guidelines which not only had yet to be adopted, but also were early in the process of review, added elements of both temporal and legal uncertainty.[84] The majority did not address questions relating to the timing of the adoption of the guidelines, as well as changes to those guidelines, to the satisfaction of the dissenters. In addition, the dissent felt that the differences between the *Trovato* claims and the *Alappat* claims where sufficient to warrant the original negative ruling in *Trovato* (1994).[85]

This ruling may show an increased willingness by the Federal Circuit to grant software patents. It also seems that the court is eager for the PTO to establish guidelines which concur with the Federal Circuit's decisions regarding software patenting.

VI. Conclusion

The general purpose computer language of the *Alappat* decision is the end result of two decades of decisions regarding the patenting of algorithms. The chain of cases between *Benson* and *Arrhythmia* show a gradual relaxation of an absolute prohibition on mathematical algorithm patents permitting claims which are implemented in accordance with a mathematical algorithm. The use of means-plus-function language in algorithm patents has allowed patent holders to increase the scope of their patents. But the restrictions placed upon the *Alappat* claims toward the application of a general purpose computer show that the court is not yet accepting broad-based algorithm patents. Equivalence analysis under both 35 U.S.C. § 112 para. 6 and the doctrine of equivalents reveals that the use of a mathematical algorithm must still be restricted by the underlying physical structure claimed in means-plus-function claims. The court's qualification in the opinion regarding the nature of the general purpose computer is evidence that the court acknowledges this restriction. Recent developments in software patenting reveal that the court is maintaining its stance regarding the necessity of ***86** structure to support such patents. These developments publicize the necessity for structure rather than hide it in a footnote. For now, at least, something more than just a programmed general purpose computer is needed to get a software patent.

Footnotes

a1 J.D. candidate, The University of Texas School of Law, May 1996.

1 *In re* Alappat, 33 F.3d 1526, 31 U.S.P.Q.2d (BNA) 1545 (Fed. Cir. 1994).

[2] *See, e.g.,* Manny D. Pokotilow, *Federal Circuit Bolsters Computer Software Patents; Programs Are an Important Technology, Should Receive Extensive Protection,* LEGAL INTELLIGENCER, Aug. 17, 1994, at 9; NLJ Staff, *Court Rules Software Protected by Patent Law,* NAT'L L.J., Aug. 15, 1994, at B2.

[3] *Alappat,* 33 F.3d at 1545, 31 U.S.P.Q.2d at 1558.

[4] *Id.* at 1538-39, 31 U.S.P.Q.2d at 1553.

[5] *Id.* at 1539, 31 U.S.P.Q.2d at 1553.

[6] *Id.*

[7] *Id.*

[8] *Id.* at 1531, 31 U.S.P.Q.2d at 1546-47.

[9] *Id.* at 1539, 31 U.S.P.Q.2d at 1553.

[10] *Id.* at 1539, 31 U.S.P.Q.2d at 1554.

[11] *Id.* at 1530-36, 31 U.S.P.Q.2d at 1546-51.

[12] *Id.* at 1541-42, 31 U.S.P.Q.2d at 1555.

[13] *Id.*

[14] *Id.* at 1542-43, 31 U.S.P.Q.2d at 1556-57.

[15] *Id.* at 1544, 31 U.S.P.Q.2d at 1557.

[16] *Id.,* 31 U.S.P.Q.2d at 1558.

[17] *Id.*

[18] *Id.* at 1545, 31 U.S.P.Q.2d at 1558.

[19] *Id.*

[20] *Id.* (emphasis in original).

[21] For a more detailed history of the cases that follow, the reader is referred to: Pamela Samuelson, *Benson Revisited: The Case*

Against Patent Protection for Algorithms and Other Computer Program-Related Inventions, 39 EMORY L.J. 1025 (1990) and Richard H. Stern, *Tales from the Algorithm War: Benson to Iwahashi, It's Deja Vu All Over Again,* 18 AIPLA Q.J. 371 (1991).

[22] The C.C.P.A. opined that:
There is one further rationale used by both the board and the examiner, namely, that the provision of new signals to be stored by the computer does not make it a new machine, i.e. it is *structurally* the same, no matter how new, useful and unobvious the result. To this question we say that if a machine is programmed in a certain new and unobvious way, it is physically different from the machine without the program; its memory elements are differently arranged. If a new machine has not been invented, certainly a "new and useful improvement" of the unprogrammed machine has been, and Congress has said in 35 U.S.C. § 101 that such improvements are statutorily subject matter for a patent.
417 F.2d 1395, 1400, 163 U.S.P.Q. (BNA) 611, 616 (C.C.P.A. 1969).

[23] *In re* Prater, 415 F.2d 1378, 159 U.S.P.Q. (BNA) 583 (C.C.P.A. 1969).

[24] 409 U.S. 63, 175 U.S.P.Q. (BNA) 673 (1972).

[25] *Id.*

[26] *Id.* at 67, 175 U.S.P.Q. at 674-75.

[27] *Id.* at 71-72, 175 U.S.P.Q. at 676.

[28] 437 U.S. 584, 198 U.S.P.Q. (BNA) 193 (1978).

[29] *Id.* at 593-94, 198 U.S.P.Q. at 199.

[30] *See In re* Freeman, 573 F.2d 1237, 197 U.S.P.Q. (BNA) 464 (C.C.P.A. 1978) (as indicated in the dissent to Diamond v. Diehr, 450 U.S. 175, 209 U.S.P.Q. (BNA) 1 (1981)).

[31] 450 U.S. 175, 209 U.S.P.Q. (BNA) 1 (1981).

[32] 888 F.2d 1370, 12 U.S.P.Q.2d (BNA) 1908 (Fed. Cir. 1989).

[33] 35 U.S.C. § 112 para. 6 (1988).

[34] 958 F.2d 1053, 22 U.S.P.Q.2d (BNA) 1033 (Fed. Cir. 1992).

[35] *Id.* at 1057, 22 U.S.P.Q.2d at 1037.

[36] *See* 35 U.S.C. § 112 (1988) (emphasis added).

[37] *See* Pennwalt Corp. v. Durand-Wayland, Inc., 833 F.2d 931, 934, 4 U.S.P.Q.2d (BNA) 1737, 1739 (Fed. Cir. 1987).

[38] *Alappat,* 33 F.3d at 1545, 31 U.S.P.Q.2d at 1558.

[39] 983 F.2d 1039, 25 U.S.P.Q.2d (BNA) 1451 (Fed. Cir. 1993).

[40] *Id.* at 1042, 25 U.S.P.Q.2d at 1454.

[41] *Id.*

[42] *Id.*

[43] *Id.* at 1043, 25 U.S.P.Q.2d at 1455.

[44] *Alappat,* 33 F.3d at 1538-39, 31 U.S.P.Q.2d at 1553.

[45] *Id.* at 1539, 31 U.S.P.Q.2d at 1553.

[46] *Id.* at 1545 n.26, 31 U.S.P.Q.2d at 1558 n.26.

[47] *Id.* at 1565, 31 U.S.P.Q.2d at 1575 (Archer, C.J., dissenting).

[48] *Id.* at 1564, 31 U.S.P.Q.2d at 1574 (Archer, C.J., dissenting).

[49] *See id.* at 1545 n.26, 31 U.S.P.Q.2d at 1558 n.26.

[50] Pennwalt Corp. v. Durand-Wayland, Inc., 833 F.2d 931, 934, 4 U.S.P.Q.2d (BNA) 1737, 1739 (Fed. Cir. 1987).

[51] *Id.* at 935, 4 U.S.P.Q.2d at 1739 (quoting Perkin-Elmer Corp. v. Westinghouse Elec. Corp., 822 F.2d 1528, 1532-33, 3 U.S.P.Q.2d (BNA) 1321, 1324-25 (Fed. Cir. 1987)).

[52] *Id.* at 934, 4 U.S.P.Q.2d at 1739.

[53] *Valmont,* 983 F.2d at 1043, 25 U.S.P.Q.2d at 1455.

[54] *Id.* at 1043-44, 25 U.S.P.Q.2d at 1455.

[55] *Alappat,* 33 F.3d at 1545 n.26, 31 U.S.P.Q.2d at 1558 n.26.

[56] *Id.* at 1566, 31 U.S.P.Q.2d at 1576 (Archer, C.J., dissenting).

[57] 42 F.3d 1376, 33 U.S.P.Q.2d (BNA) 1194 (Fed. Cir. 1994).

[58] *PTO Proposed Examination Guidelines for Computer-Implemented Inventions,* 50 Pat. Trademark & Copyright J. (BNA) 164-66 (June 8, 1995).

[59] *In re* Trovato, 60 F.3d 807, 35 U.S.P.Q.2d (BNA) 1570 (Fed. Cir. 1995).

[60] *In re* Trovato, 42 F.3d at 1377, 33 U.S.P.Q.2d at 1195 [[[hereinafter *Trovato* (1994)].

[61] *See id.,* 33 U.S.P.Q.2d at 1194.

[62] *Id.* at 1377-78, 33 U.S.P.Q.2d at 1195.

[63] *Id.* at 1378, 33 U.S.P.Q.2d at 1195-96.

[64] *Id.* The three claims that were upheld recited specific apparatus such as emergency alarm systems, electronic maps, and named particular objects to be moved. *See id.* at 1378 n.2, 33 U.S.P.Q.2d at 1196 n.2.

[65] *Id.* at 1379, 33 U.S.P.Q.2d at 1196.

[66] *Id.,* 33 U.S.P.Q.2d at 1196-97.

[67] *Id.,* 33 U.S.P.Q.2d at 1197.

[68] *Id.* at 1380, 33 U.S.P.Q.2d at 1197.

[69] *Id.* ("When questioned during oral argument before this Court, counsel for Trovato admitted that neither specification includes a hardware enablement of the claimed invention.").

[70] *Id.* at 1383, 33 U.S.P.Q.2d at 1200.

[71] *Id.* at 1382, 33 U.S.P.Q.2d at 1199.

[72] *PTO Proposed Examination Guidelines for Computer-Implemented Inventions,* 50 Pat. Trademark & Copyright J. (BNA) 164 (June 8, 1995).

[73] *Id.* (emphasis added).

[74] *Id.* at 164-65.

[75] *Id.* at 165.

[76] *Id.*

[77] *Id.*

[78] *Id.*

[79] *In re* Trovato, 60 F.3d 807, 35 U.S.P.Q.2d (BNA) 1570 (Fed. Cir. 1995).

[80] *Id.* at 807, 35 U.S.P.Q.2d at 1570.

[81] *Id.,* 35 U.S.P.Q.2d at 1571.

[82] *Id.*

[83] *Id.* at 808, 35 U.S.P.Q.2d at 1571.

[84] *Id.*

[85] *Id.,* 35 U.S.P.Q.2d at 1571-72.