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THE FEDERAL CIRCUIT AND NON-PATENTABLE SUBJECT MATTER UNDER *IN RE ALAPPAT* AND *IN RE WARMERDAM*

C. Mark Kittredge†

I. INTRODUCTION

In *In re Alappat*,¹ decided July 29, 1994, a sharply divided *en banc* Court of Appeals for the Federal Circuit reversed the decision of an expanded panel of the Board of Patent Appeals and Interferences of the United States Patent and Trademark Office ("PTO"). The expanded panel had affirmed an examiner's rejection of a claim related to a computer program as being unpatentable under 35 U.S.C. § 101 because it recited a mathematical algorithm.² In reversing the PTO and allowing the subject claim, the Federal Circuit disapproved the PTO's practice of rejecting claims related to computer programs merely because they 'read on' a general purpose computer programed according to the subject program. In addition, the Federal Circuit appeared to recognize that a "mathematical algorithm" could be patentable subject matter, and appeared to signal a shift towards broad recognition of the patentability of computer programs, standing alone. It thus appeared from *Alappat* that the Federal Circuit would no longer tolerate perfunctory rejections of patent claims that could be termed "mathematical algorithms".

However, only two weeks later, in *In re Warmerdam*³ a three-judge panel of the Federal Circuit found certain claims directed to a

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1. 33 F.3d 1526 (Fed. Cir. 1994).

2. The Federal Circuit also addressed an important jurisdictional issue (upholding the Commissioner's right to empanel an expanded panel of the Board of Patent Appeals and Interferences to reconsider decisions of an original panel that the Commissioner disagrees with) and reaffirmed its *en banc* decision in *In re Donaldson*, 16 F.3d 1189 (Fed. Cir. 1994) requiring the PTO to apply the requirements of 35 U.S.C § 112 ¶ 6 when considering the patentability of means-plus-function claims. While these aspects of the Court's opinion are noteworthy, this comment focuses on the 35 U.S.C. § 101 analysis.

3. 33 F.3d 1354 (Fed. Cir. 1994). *Warmerdam* was decided by Circuit Judges Plager, Lourie and Clevenger, with the opinion written by Judge Plager. In *Alappat*, Judges Plager and Lourie concurred with the majority on both the jurisdictional and substantive issues, whereas Judge Clevenger dissented on the jurisdictional issue and did not reach the substantive issue.

method and apparatus to control the motion of robotic machines to be non-patentable subject matter under 35 U.S.C. § 101. Although *Warmerdam* did not specifically find that the subject claims were "mathematical algorithms", it used language strongly suggesting that "mathematical algorithms" are, *per se*, not patentable. While *Warmerdam* is theoretically reconcilable with *Alappat*, at a minimum, it shows confusion because it provides strong support for the PTO's routine rejection of claims that can be described as "mathematical algorithms", and because it failed to address the *Alappat* decision.⁴

II. THE CONTRASTING DECISIONS

A. *The Alappat Decision*

Judge Rich, writing for the majority in *Alappat*, framed the § 101 analysis with the four modern Supreme Court decisions interpreting 35 U.S.C. § 101: *Diamond v. Chakrabarty*,⁵ which broadly defined patentable subject matter under 35 U.S.C. § 101; and the trilogy of *Diamond v. Diehr*,⁶ *Parker v. Flook*,⁷ and *Gottschalk v. Benson*,⁸ each of which considered the patentability of computer programs and related algorithms and discussed the general exceptions to the broad scope of patentable subject matter under § 101.

Judge Rich first emphasized "that Congress intended § 101 to extend to 'anything under the sun that is made by man'."⁹ He then noted that, notwithstanding the apparent broad sweep of § 101, the Supreme Court has recognized "three categories of subject matter for which one may not obtain patent protection, namely 'laws of nature, natural phenomena, and abstract ideas'."¹⁰ Judge Rich further noted that "the Supreme Court also has held that certain mathematical subject matter is not, standing alone, entitled to patent protection."¹¹

Judge Rich then emphasized that "the Supreme Court never intended to create an overly broad, fourth category of subject matter

4. *Alappat* was mentioned only once by the *Warmerdam* Court. See Section B below.

5. 447 U.S. 303 (1980).

6. 450 U.S. 175 (1981).

7. 437 U.S. 584 (1978).

8. 409 U.S. 63 (1972).

9. *Alappat*, 33 F. 2d at 1542 (citing *Chakrabarty*, 447 U.S. at 309, quoting S.Rep. No. 1979, 82nd Cong., 2nd Sess., 5 (1952); H.R. Rep. No. 1923, 82nd Cong., 2nd Sess., 6 (1952)).

Contrast *Warmerdam* where the Court began its discussion by noting that "[d]espite the oft-quoted statement in the legislative history of the 1952 Patent Act that Congress intended that statutory subject matter 'includes anything under the sun that is made by man,' . . . Congress did not so mandate." *Warmerdam*, 33 F.3d at 1358 (citations omitted).

10. *Alappat*, 33 F.3d at 1542 (quoting *Diehr*, 450 U.S. at 185).

11. *Alappat*, 33 F.3d at 1543 (citing *Diehr*, 450 U.S. 175, *Flook*, 437 U.S. 584, and *Benson*, 409 U.S. 63).

excluded from § 101," but was merely explaining that "certain types of mathematical subject matter, standing alone, represent nothing more than *abstract ideas*."¹² Judge Rich thus framed the § 101 question as:

whether the claimed subject matter *as a whole* is a disembodied mathematical concept, whether categorized as a mathematical formula, mathematical equation, mathematical algorithm, or the like, which in essence represents nothing more than a 'law of nature,' 'natural phenomenon,' or 'abstract idea'(emphasis added).¹³

That is, a "mathematical algorithm" is non-patentable subject matter only if it is "in essence . . . nothing more than a 'law of nature', 'natural phenomenon', or 'abstract idea'."¹⁴

With the issue thus framed, the majority specifically found that the subject claim, viewed as a whole, "is not a disembodied mathematical concept which may be characterized as an 'abstract idea', but rather a specific machine to produce a useful, concrete, and tangible result."¹⁵

This fact-specific finding provides little guidance for future questions regarding the patentability of claims encompassing, or directed to, computer programs. However, in ruling that the subject claim was patentable, the majority specifically rejected the PTO's argument that it was unpatentable because it 'read on' a general purpose digital computer programmed according to the claim.¹⁶ Judge Rich emphasized that "such programming creates a new machine because 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."¹⁷

Of possibly greater importance, however, was the court's framing of the question in a way that appeared to severely limit the so-called "mathematical algorithm" exception to § 101. Judge Rich did not go so far as to hold that a claim to a computer program, by itself (i.e., one not tied to a specific apparatus, such as a digital computer), may be patentable. However, he appears to have stepped right up to that line: "The fact that the four claimed means elements function to transform one set of data to another through what may be viewed as a series of mathematical calculations does not alone justify a holding that the

12. *Alappat*, 33 F.3d at 1543.

13. *Alappat*, 33 F.3d at 1544.

14. *Id.*

15. *Alappat*, 33 F.3d at 1544.

16. *Alappat*, 33 F.3d at 1544-45.

17. *Id.* at 1545 (citations omitted).

claim as a whole is directed to non-statutory subject matter."¹⁸ Such language suggests a willingness by the Federal Circuit to find a claim directed to a computer program to be patentable under 35 U.S.C. § 101, as long as the claim as a whole "is not a disembodied mathematical concept which may be characterized as an 'abstract idea'."¹⁹

The concurring opinion of Judges Newman and Rader in *Alappat* provided even more encouragement that the Federal Circuit is leaning toward a broader recognition that computer programs, standing alone, constitute patentable subject matter.

Judge Newman wrote her concurring opinion with specific reference to the PTO's custom regarding computer-related inventions, emphasizing the distinction "between abstract mathematical principles and their practical applications", and condemning the PTO's "historical practice of giving § 101 its narrowest possible reading".²⁰ Moreover, through her analysis, Judge Newman appears to indicate that *Alappat*'s invention was patentable whether or not it was specifically tied to computer hardware. In describing the invention, Judge Newman noted:

The structure resides in the configuration by which the device operates . . . , and is independent of how that configuration is provided. The structure may reside in semiconductor chips and hardwired connections, or be permanently embedded in the electronic form designated read-only memory, or removably embedded in the electronic form designated random-access memory. *It is not relevant to § 101 whether the structure is hardwired or programmed, machine-readable or manually performed.*²¹

Judge Rader, in his concurring opinion, went further and specifically recognized that mathematical algorithms, even standing alone, are not *per se* excluded from § 101. "Only algorithms which merely represent discovered principles are excluded from § 101."²² "[T]he Supreme Court only denies patentable subject matter status to algorithms which are, in fact, simply laws of nature."²³

Judge Rader further emphasized that the claim must be viewed as a whole, and that "if a digital circuit or its use would define an invention under § 101, then the same invention described in terms of 'a mathematical formula, computer program or digital computer' should

18. *Alappat*, 33 F.3d at 1544.

19. *Id.*

20. *Alappat*, 33 F. 3d at 1569.

21. *Id.* at 1570 (emphasis added).

22. *Alappat*, 33 F.3d at 1582.

23. *Id.*

be statutory subject matter as well.”²⁴ Moreover, “[t]he limits on patentable subject matter within § 101 do not depend on whether an invention can be expressed as a mathematical relationship or algorithm. Mathematics is simply a form of expression—a language.”²⁵

Finally, Judge Rader chastised the PTO, noting that it “has no justification within the Patent Act to ignore algorithmic processes or machines as ‘useful Arts’ within the scope of § 101.”²⁶ He further emphasized that “[t]his court should not permit the Patent and Trademark Office to administratively emasculate research and development in this area by precluding statutory protection for algorithmic inventions.”²⁷

B. *The Warmerdam Decision*

In re Warmerdam involved method and apparatus claims related to control of the motion of robotic machines to avoid collisions with other objects. The method claims defined “a method for generating a data structure” representing the shape of such machines and formed the basis of the 35 U.S.C. § 101 analysis.²⁸

Judge Plager, writing for a three-judge panel, began the § 101 analysis by emphasizing the limits to patentable subject matter. In direct contrast to *Alappat*, Judge Plager noted: “[d]espite the oft-quoted statement in the legislative history of the 1952 Patent Act that Congress intended that statutory subject matter ‘includes anything under the sun that is made by man,’ . . . Congress did not so mandate.”²⁹ Judge Plager then used narrowing language to emphasize the limits of § 101: “Congress included in patentable subject matter *only* those things that qualify as ‘any . . . process, machine, manufacture, or composition of matter, or any . . . improvement thereof . . .’”³⁰ It is noteworthy that, without discussion, the Court suggested a favorable comparison could be drawn to *In re Alappat*.³¹ This is the only place in the *Warmerdam* opinion where *Alappat* is even mentioned.

As with *Alappat*, the *Warmerdam* Court noted the Supreme Court cases of *Diehr*, *Benson* and *Flook* and recognized that they stand for the “long-established principle, that patent protection is not available

24. *Id.* at 1582-83.

25. *Id.* at 1583.

26. *Id.* at 1583 (citation omitted).

27. *Id.* at 1583.

28. *Warmerdam*, 33 F.3d at 1357.

29. *Id.* at 1358 (citation omitted).

30. *Warmerdam*, 33 F.3d at 1358 (emphasis added)(quoting 35 U.S.C. § 101 (1988)).

31. *Id.*

for laws of nature, natural phenomena, and abstract ideas."³² However, the *Warmerdam* Court then emphasized that:

Within Supreme Court guidance, this court and its predecessor, as well as the Patent and Trademark Office (PTO), have sought to find more precise definitions for the things excluded, but without complete success. One notion that emerged and has been invoked in the computer related cases is that *a patent cannot be obtained for a "mathematical algorithm"*.³³

Admitting the difficulty in "agree[ing] as to what is a 'mathematical algorithm,'" the *Warmerdam* court considered the method claims against the prohibition that "laws of nature, natural phenomena [and] abstract ideas" are not patentable.³⁴

Accordingly, the § 101 question in *Warmerdam* was framed thusly: "[w]hat is it that [the claimed] process does, and in doing it is it other than what the Supreme Court must have understood to be 'laws of nature, natural phenomena or abstract' ideas?"³⁵ This approach is not inconsistent with that pursued by Judge Rich in the *Alappat* decision. However, after significant discussion emphasizing the mathematical nature of the method claims, Judge Plager focused the issue more narrowly (at least in terms of the scope of patentable subject matter): "whether the claim is for a process that goes beyond simply *manipulating* 'abstract ideas' or 'natural phenomena'."³⁶

With the issue thus framed, the court had little difficulty in concluding that the claims "describe nothing more than the manipulation of basic mathematical constructs, the paradigmatic 'abstract idea'."³⁷ Citing an 1874 Supreme Court opinion, Judge Plager then emphasized that "an idea of itself is not patentable."³⁸ Judge Plager then concluded (without citing any authority) that "taking several abstract ideas and manipulating them together adds nothing to the basic equation."³⁹

32. *Warmerdam*, 33 F.3d at 1358 (citations omitted).

33. *Id.* at 1358-59 (emphasis added) (citation omitted).

34. *Id.* at 1358-9. However, the Court's broad statement that "a patent cannot be obtained for a "mathematical algorithm," remains. *Id.* at 1359. Moreover, through its analysis the *Warmerdam* Court continued to emphasize that the method claims were "mathematical in nature," and implicitly recognized that "mathematical algorithms" are not patentable. *Id.* at 1360. Such language and analysis will provide strong encouragement for the PTO to continue its routine practice of rejecting claims that can be described as "mathematical algorithms."

35. *Id.* at 1359.

36. *Id.* at 1360 (emphasis added) (footnote omitted).

37. *Id.* at 1360.

38. *Id.* at 1360 (citing *Rubber-Tip Pencil Co. v. Howard*, 87 U.S. (20 Wall.) 498, 507 (1874)).

39. *Id.* at 1360.

The *Warmerdam* Court thus found that the subject method claims were not patentable subject matter under § 101. While *Warmerdam* can be reconciled with *Alappat*, to do so probably eviscerates any suggestion in *Alappat* that mathematical algorithms, or computer programs that can be described as such, are patentable subject matter standing alone (i.e., as method claims not tied to a specific apparatus, such as a computer). Moreover, *Warmerdam* provides strong support for the PTO to continue its perfunctory and routine practice of rejecting claims that can be described as “mathematical algorithms.”⁴⁰

Such conclusions are supported by the *Warmerdam* Court’s handling of one of the apparatus claims. Claim number 5, which had been rejected by the PTO as indefinite under 35 U.S.C. § 112, was for “a machine having a memory which contains data . . . generated by the method of any of [the method claims].”⁴¹ That is, claim 5 appears to define nothing more than a computer with data in its memory generated by methods that are not patentable under § 101. The PTO did not reject this claim under any § 101 theory, and, accordingly, the Federal Circuit was not required to consider whether it covered patentable subject matter. However, before beginning the indefiniteness analysis under § 112, Judge Plager emphasized that “[c]laim 5 is for a machine, and is clearly patentable subject matter.”⁴²

Stating that such an apparatus claim is patentable subject matter under § 101 obviously strengthens the *Alappat* Court’s dismissal of the PTO’s practice of rejecting such claims drafted so broadly that they would ‘read on’ a general purpose computer programmed according to the claim. However, the *Warmerdam* Court’s statement that “a patent cannot be obtained for a mathematical algorithm”, along with its analysis emphasizing the “mathematical nature” of the method claims, will bolster the PTO’s long-standing practice of routinely rejecting such claims.

III. CONCLUSION

The *Warmerdam* opinion supports the majority’s holding in *Alappat* that dismissed the PTO’s ‘knee-jerk’ rejection of computer program patent claims that are drafted broadly enough to read on a general purpose computer programmed according to the claim. How-

40. See also, *In re Trovato*, 42 F.3d 1376, 33 USPQ 2d 1194 (Fed. Cir. 1994). In *Trovato*, decided December 19, 1994, the Federal Circuit affirmed a rejection of certain claims as non-statutory subject matter under § 101 because they “recite[d] a mathematical algorithm” that was not applied to or limited by physical elements or process steps. *Id.* at 1197.

41. *Id.* at 1358-60.

42. *Id.* at 1360.

ever, *Warmerdam* greatly weakens any suggestion in *Alappat* that the Federal Circuit is moving towards broader recognition of the patentability of mathematical algorithms, or computer programs that can be described as such. At a minimum, *Warmerdam* provides the PTO with language that will support a continuance of its routine practice of rejecting computer program patent claims that can be described as "mathematical algorithms".

Accordingly, claims draftsmen working in this area should continue to include a range of patent claims that tie the subject computer program to general purpose computers, as well as to specific machines, programmed according to the subject program.