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**Updates in Science & Technology Law —
Software**

Ian DiBernardo



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A BRIEF PRACTITIONER'S GUIDE TO THE PATENTABILITY OF MATHEMATICAL ALGORITHMS AND SOFTWARE: *IN RE ALAPPAT*

1. In the second half of 1994, the Federal Circuit issued several opinions that have removed many of the uncertainties surrounding the patentability of mathematical algorithms and computer software. *In re Alappat*¹ and its progeny — *In re Warmerdam*² and *In re Trovato*³ — provide a clear rationale from which practitioners may structure and draft applications directed to computer algorithms. *Alappat*, the first decision, provided the framework for the subsequent cases. The following is a brief discussion of the *Alappat* decision, its rationale, and its effect on patent practice.⁴

Background

2. *Alappat*'s invention relates generally to a means for producing a smooth waveform on an oscilloscope.⁵ The oscilloscope screen, the front of which is a cathode-ray tube, includes an array, or raster, of pixels, each of which illuminates only when an electron beam is directed to it. The oscilloscope samples and digitizes an input signal to provide a waveform data sequence or "vector list." The oscilloscope display comprises a series of straight vectors drawn between two points representing successive input samples. Because the oscilloscope screen displays a finite number of pixels, rapidly rising or falling signals may appear jagged or discontinuous. *Alappat*'s invention provides an anti-aliasing system that varies the illumination intensity of the pixels comprising the displayed waveform; pixels with center points furthest from the trajectory of the waveform receive the greatest illumination, while pixels with center points lying directly on the waveform's trajectory receive the least illumination. Consequently, the oscilloscope displays a smooth waveform.
3. The Board of Patent Appeals and Interferences ("Board") sustained the examiner's rejection of claims 15-19 under 35 U.S.C. § 101 "because the claimed invention [was] non-statutory subject matter" Of those claims, claim 15 was the only independent claim. It read:

A rasterizer for converting vector list data representing sample magnitudes of an input waveform into anti-aliased pixel intensity data to be displayed on a display means comprising:

 - (a) means for determining the vertical distance between the endpoints of each vector 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.

4. Judge Rich, writing for the majority in *Alappat*, held that the Board had erred in several respects and, consequently, reversed the Board's rejection of claims 15-19.

Means-Plus-Function and §112

5. In making its patentability determination, the Board held that it need not apply section 112, paragraph 6, which states that a claim recited in means-plus-function form "shall be construed to cover the corresponding structure, material or acts described in the specification and equivalents thereof."⁶ The Board believed that claim construction in infringement cases differs from claim construction during patent prosecution.⁷ Rather than imputing limitations found in the specification into the claims, the Patent and Trademark Office ("PTO") gives means-plus-function clauses their broadest possible interpretations.⁸[6]
6. The Federal Circuit found that the Board had erred by interpreting each of the means clauses without reference to the corresponding disclosure in the specification. According to *In re Donaldson*,⁹ however, the PTO is not exempt from following the statutory mandate of section 112, paragraph 6.¹⁰ Consequently, the Federal Circuit interpreted *Alappat*'s claims by looking to the specification.

Specification

7. Applying its erroneous rationale, the Board interpreted the means clauses to encompass every means for performing the functions cited.¹¹ It concluded that the claim was merely a process claim wherein each means clause represented a step in that process.¹² The Board based this finding on *In re Abele*,¹³ *In re Pardo*,¹⁴ and *In re Walter*.¹⁵ The *Alappat* court distinguished these cases.
8. Section 112, paragraph 6 requires that each of the means recited in a claim be construed to cover at least the structure disclosed in the specification corresponding to the means. In the cases relied upon by the Board, the court correctly held that the claims at issue were merely process claims because the specifications lacked any structure that corresponded to the means elements.¹⁶

Alappat, on the other hand, disclosed specific electronic circuitry elements that corresponded to the means elements.¹⁷ Consequently, Alappat's detailed disclosure prevented a finding of a mere process claim.

9. In a patent application directed to a mathematical or computer algorithm, therefore, a detailed specification, which recites specific structures corresponding to the means elements, should accompany means plus function claim language.

§101: Practical Application Versus Disembodied Mathematical Concept

10. The Federal Circuit addressed the Board's rejection of claim 15, under the judicially-created mathematical algorithm exception to section 101 patentable subject matter, by clarifying the exception. The exception covers laws of nature, natural phenomena, and abstract ideas.¹⁸ The Federal Circuit clarified the inclusion of mathematical subject matter in this exception: in cases where the Supreme Court had held mathematical subject matter unpatentable, the rationale had focused upon the classification of the mathematical subject matter as an abstract idea, not as a separate, fourth group outside the scope of section 101.¹⁹ When a practical application incorporates an abstract idea, however, the idea may be patentable.²⁰ Furthermore, in determining whether an abstract idea exists as part of a practical application, the analysis must view the claim as a whole.²¹ The proper inquiry, therefore, is "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 no more than a 'law of nature,' 'natural phenomenon,' or 'abstract idea.'"²²
11. In applying this test, the Federal Circuit described the claimed invention as a "combination of interrelated elements which combine to form a machine for converting discrete waveform data into anti-aliased pixel illumination intensity data to be displayed on a display means."²³ The claimed rasterizer was not a disembodied mathematical concept, but rather a specific machine that produced a useful, concrete, and tangible result.²⁴ The Federal Circuit concluded that the machine was patentable subject matter.
12. In reaching this conclusion, the Federal Circuit focused on the specification and the preamble to the claim in question. As discussed above, structures in the specification that correspond to the means elements in the claim must be present as

they are used in determining whether the claim is directed to a specific, practical application.

13. The Federal Circuit also viewed the preamble as significant because it was more than a mere field-of-use label.²⁵ The *Alappat* preamble recites that the claimed rasterizer converts inputted waveform data into anti-aliased waveform data for display, thereby pointing out the practical application of the mathematical concept. Furthermore, the claimed elements reference the input and output recited in the specification, arguably focusing upon the combination of elements — the machine — for producing the intended result. In the preamble, therefore, practitioners should strive to recite the purpose of manipulating the data, thereby showing utility, and to tie the claimed elements to the data being manipulated, thereby directing the invention towards a machine and away from a disembodied mathematical concept.

Software and the General Purpose Computer

14. The Board also rejected *Alappat*'s claim 15 as unpatentable because it "reads on a general purpose digital computer 'means' to perform the various steps under program control."²⁶ The Board would not presume that a stored program digital computer was outside the section 112, paragraph 6 range of structure equivalents disclosed in the specification.²⁷ Since the stored program digital computer may have been within the range of equivalents, the claim read on such a computer.
15. The Federal Circuit agreed with *Alappat* in concluding that although claim 15 would read on a general purpose computer programmed to perform the claimed invention, such a finding alone would fail to justify a holding that claim 15 was directed to unpatentable subject matter. When a general purpose computer is programmed to carry out a specific task, such programming has been held to create a new machine.²⁸ Performing particular functions for a particular purpose, the once-general computer in effect becomes a "special purpose computer."²⁹ Consequently, a computer operating pursuant to software may represent patentable subject matter within section 101.³⁰
16. The *Alappat* distinction between general purpose computers and special purpose computers may prove useful to practitioners. In light of the majority's recognition of the ability of a programmed general computer to pass section 101 scrutiny, practitioners may wish to include a set of claims directed to a special purpose

computer, namely a computer programmed to perform particular functions for a particular purpose.

Conclusion

17. *Alappat* provides practitioners with general guidelines for drafting applications for inventions involving mathematical or computer algorithms. First, practitioners should attempt to avoid means-plus-function claim language for at least some elements as this might prevent a finding that the invention is merely a disembodied mathematical concept. Second, if practitioners use means-plus-function language, they should include in the specification detailed information on several embodiments with definite structure. Because the PTO must apply section 112, paragraph 6, these structures will be imputed into the claim during interpretation and will support a finding that the claimed invention is a practical application of the mathematical concept or a machine. Third, further avoiding rejection under section 101, practitioners may seek to claim a "special purpose computer" as endorsed in *Alappat*. Last, the preamble of a claim should recite the utility of the manipulation of the data and should tie the claimed elements to the inputted and outputted data, thereby increasing the chances for a finding of a practical application.

CHANGES IN PTO REEXAMINATION PROCEDURE

18. In August 1993, the U.S. Patent and Trademark Office ("PTO") issued U.S. Patent No. 5,241,671, owned jointly by Compton's New Media and Encyclopedia Britannica (together "Compton's"). The patent covered multimedia programming techniques specifically directed to a system for searching and retrieving text, graphics, audio, animation, and video from multimedia databases. Compton's announced its plan to enforce the patent by requiring all developers who might have been infringing the patent to either distribute their products through Compton's or pay royalties. The software industry protested the patent's issuance and argued that the patent was too broad and covered software techniques widely used in multimedia applications.
19. In response, not only did the PTO decide to reexamine the patent, but it also departed from the typical procedure of restricting its acceptance of additional prior art to that offered by the patentee. The PTO opened the door to any party offering patents issued or publications printed before Compton's filing date. The PTO

accepted no proof of public use or sale, thereby leaving the related evidentiary matters to courts.

20. The PTO also recognized that its previous review of software patent applications had been inadequate. After finding previously overlooked documents that would have invalidated Compton's application, the PTO decided to broaden its examination capabilities. Examiners with degrees in computer science can now search CD-ROM databases, libraries of software manuals and textbooks, and over nine hundred on-line databases.
21. The PTO's reception of the software industry's views combined with its expanded examination practice has led to some stinging results. For Compton's, the result was patent rejection. Another result has been more frequent reexamination of software patents. The PTO reexamined Software Advertising Corporation's ("SAC") patent, which covers a system that integrates an advertisement into a computer program without altering the function of the program. Under the cloud of potential litigation, PC Dynamics, Inc., publisher of the Energizer Bunny Screen Saver, elicited the aid of other desktop entertainment publishers in lobbying for reexamination. As with Compton's patent, the PTO rejected SAC's patent.
22. The PTO's "revised" reexamination procedure has a broader ramification as well. The PTO's willingness to hear industry concerns may quell software producers' fears of overly broad patents that cover previously employed technologies. These fears are particularly strong in the software industry where, due to the uncertain and restrictive patentability standards for software, many firms have opted for trade secret rather than patent protection. Even though the present U.S. practice of keeping patent applications secret prevents opposition before issuance, software producers should now feel somewhat reassured that substantial post-issuance opposition can be effective in limiting the scope of software patents.

LOTUS DEV. CORP. V. BORLAND INT'L, INC.

Background

23. The First Circuit recently held that a software menu command hierarchy is not copyrightable subject matter.³¹
24. Plaintiff-appellee Lotus Development Corporation ("Lotus") held a copyright in Lotus 1-2-3, a computer spreadsheet program. Users controlled the operation of Lotus'

program by choosing commands, such as “copy,” “print,” and “quit,” from the command menu. Lotus’ menu command hierarchy consisted of 469 commands arranged into more than fifty menus and submenus. Defendant-appellant Borland International, Inc., (“Borland”) copied the words and structure of Lotus’ menu command hierarchy and produced a competing spreadsheet program with a “virtually identical” menu command hierarchy. Although Borland copied the words and structure of the menu trees, Borland copied no computer code.³²

25. The district court, in granting partial summary judgment for Lotus, held that Borland infringed Lotus’ copyright. In finding infringement, the court first determined that Lotus’ menu command hierarchy included copyrightable expression. Specifically, protectable expression stemmed from Lotus’ selection and arrangement of the command terms.³³ The court further determined that the copied elements comprised an integral part of Lotus 1-2-3.³⁴ Consequently, the court found infringement, a decision from which Borland appealed.

Discussion

26. In an opinion certain to send ripples through the software industry, the First Circuit reversed the finding of infringement. While the district court began its analysis by searching for some copyrightable expression within the menu command hierarchy, the First Circuit focused on the issue of whether the menu command hierarchy was copyrightable at all. It held that the menu command hierarchy was a “method of operation” and was prohibited from receiving copyright protection pursuant to 17 U.S.C. § 102(b).

Altai

27. In reaching its conclusion that a menu command hierarchy is a method of operation, the First Circuit rejected the abstraction, filtration, comparison test enunciated in *Computer Assoc. Int’l, Inc. v. Altai, Inc.*³⁵ Courts have used the *Altai* test to determine whether non-literal infringement — paraphrasing rather than verbatim copying — occurred.³⁶ The abstraction step requires courts to “dissect the allegedly copied program’s structure and isolate each level of abstraction contained within it.”³⁷ In the filtration step, courts examine levels of abstraction to determine whether a particular element is unprotectable as (1) an idea, (2) dictated by efficiency concerns, or (3) taken from the public domain.³⁸ The last step requires a comparison of the protected elements of the allegedly infringing

work to the copyrighted work to determine whether the defendant copied protected expression in sufficiently great amounts to constitute copyright infringement.³⁹

28. In *Computer Assoc.*, the First Circuit believed the *Altai* test misleading. In particular, the First Circuit found the abstraction stage troubling because its application seemed to encourage continued program dissection until a court found a base level of copyrightable subject matter.⁴⁰ Filtering idea from expression after abstracting a menu command hierarchy down to its individual word and menu levels ignored the question of whether a menu command hierarchy was copyrightable at all.⁴¹ According to the First Circuit, a menu command hierarchy is not subjectable to abstraction. The proper initial inquiry, therefore, was whether a menu command hierarchy as a whole is copyrightable.⁴²

Menu command hierarchy: a "method of operation"

29. Viewing the menu command hierarchy as a whole, the First Circuit found it to be a "method of operation" within section 102(b) of the Copyright Act. 17 U.S.C. § 101 *et seq.* (1993). Section 102(b) reads:
30. In no case does copyright protection for an original work of authorship extend to any idea, procedure, process, system, method of operation, concept, principle, or discovery, regardless of the form in which it is described, explained, illustrated, or embodied in such a work.⁴³
31. The First Circuit defined a method of operation in the following manner. A method of operation is "the means by which a person operates something, whether it be a car, a food processor, or a computer."⁴⁴ A copyright on text describing a method of operation does not in itself extend copyright protection to a method of operation.⁴⁵ A method of operation is free for all to use and to describe in their own words.⁴⁶ After defining the term "method of operation," the First Circuit proceeded to apply it to Lotus' menu command hierarchy. Because the Lotus menu command hierarchy provides the means by which users control and operate Lotus 1-2-3, the court found the menu command hierarchy within the definition of "method of operation."⁴⁷ Users have to use command terms to instruct a computer what to do. For example, if users wish to print a document, they must use the "print" command. Although the menu command hierarchy contained expression in the selection and arrangement of command terms, where "specific words are

essential to operating something, they are part of a 'method of operation' and, as such, are unprotectable."⁴⁸ In short, because no other way to control the program exists, the First Circuit found the Lotus 1-2-3 menu command hierarchy constituted the program's method of operation.

32. In support of its finding that the menu command hierarchy was a "method of operation" for Lotus 1-2-3, the First Circuit analogized a menu command hierarchy to a video cassette recorder ("VCR").⁴⁹ Just as a VCR user must push buttons with labels such as "play," "reverse," or "fast forward," the court reasoned that a 1-2-3 user must choose among commands such as "copy," "print," or "quit." The court found the only difference to be that, while the labels on VCR buttons are merely helpful, menu commands are necessary in order to "push" the Lotus "buttons." *Id.* at *35. The court then rejected this difference as irrelevant and found both VCR buttons and menu command hierarchies to be methods of operation.⁵⁰

Unprotected original expression

33. The First Circuit also attempted to square its decision with the Supreme Court's holding in *Feist Publications, Inc. v. Rural Tel. Serv. Co.*⁵¹ In *Feist*, the Court had stated that "copyright assures authors the right to their original expression"⁵² The First Circuit recognized that this statement does not mean that all expression is copyrightable,⁵³ and held that while original expression is necessary for copyright protection, a court must first inquire into whether the expression falls within one of the categories prohibited under section 102(b).⁵⁴ Even though the menu command hierarchy contained original expression, it was unprotectable. In this unprecedented holding, the First Circuit contradicted many established copyright principles, because a menu command hierarchy is a method of operation excluded from copyright under section 102(b).
34. If Lotus appeals the First Circuit decision, the Supreme Court is likely to grant certiorari, because the Circuits are split. As the First Circuit recognized, its holding that the abstractions test cannot be applied to "methods of operation" is counter to the Tenth Circuit's decision in *Autoskill, Inc. v. National Educ. Support Sys., Inc.*,⁵⁵ in which the Tenth Circuit rejected a defendant's argument that a keying procedure used in a computer program is an uncopyrightable "procedure" or "method of operation" under section 102(b).⁵⁶ The First Circuit's decision also gives rise to broader questions with respect to the scope and relationship of "ideas" and "methods of operation." If the Supreme Court does hear the case, possible flaws in the First Circuit's reasoning may justify reversal.

35. The First Circuit's "method of operation" definition — the means by which a person operates something — leads to a finding that arguably contradicts the language of section 102(b). Section 102(b) makes a distinction between amorphous, theoretical classifications and the concrete "form[s] in which [they are] described, explained, illustrated, or embodied"⁵⁷ More importantly, the works for which protection is sought may *contain* the embodiments of these 102(b) theoretical classifications. Section 102(b) reads:
36. In no case does copyright protection for an original work of authorship extend to any idea, procedure, process, system, method of operation, concept, principle, or discovery, regardless of the form in which it is described, explained, illustrated, or embodied *in such a work*.⁵⁸
37. For example, a user's manual that describes the "method of operation" of a utilitarian article is a copyrightable literary work that exists separately from the underlying utilitarian article and its method of operation. In the case of computer program interfaces, a menu command hierarchy describes the method of operation of the underlying computer program and may still constitute a separate copyrightable expression. The question is really one of degrees on a scale between a user's manual on the one hand and a mere listing of "copy," "print," or "quit" commands.
38. In addition, the First Circuit's application of its "method of operation" definition to Lotus 1-2-3 seems too broad. It is difficult to see how the Lotus 1-2-3 program merely embodies a "method of operation" if the means of operating the program includes the selection and arrangement of command terms. A search for a "method of operation" and its embodiment more commensurate with the language of section 102(b) requires the abstraction test used by the district court in *Borland II*. Under the abstraction test, the "method of operation" for an electronic spreadsheet might include taking an existing value and reproducing it in another section of memory and in another section of the screen grid. The embodiment or description of the method of reproducing values is then the word "copy."
39. The First Circuit's analogy of a computer program to a VCR exposes perhaps another flaw in the holding that "methods of operations" are not amenable to abstraction. The First Circuit discussed the argument that a VCR is unlike a computer program because the former is generally uncopyrightable. If a VCR were

copyrightable, the First Circuit believed, it would be subject to the “useful article” exception. A useful article, namely an article having an intrinsic utilitarian function, is copyrightable “only to the extent that such design incorporates pictorial, graphic, or sculptural features that can be identified separately from, and are capable of existing independently of, the utilitarian aspects of the article.”⁵⁹ Although applying this exception to a VCR would justify finding the arrangement of the buttons uncopyrightable, the First Circuit stated that the button arrangement would be uncopyrightable even without the useful article exception because the buttons are a “method of operation.”⁶⁰

40. In focusing on whether the arrangement of the buttons would be copyrightable, however, the First Circuit failed to address another potentially copyrightable aspect — the shape of the buttons. Arguably, unique shapes for the buttons would be protectable as having “pictorial, graphic, or sculptural features that can be identified separately from, and are capable of existing independently of, the utilitarian aspects of the article.”⁶¹ In effect, copyright law calls for abstraction of useful articles for identification of protectable pictorial, graphic, and sculptural features. Although copyrightable as literary works, computer programs are useful articles; they exist as “means for causing something to happen [having] ... a mechanical utility”⁶² It seems possible that the Supreme Court would allow the abstraction of a computer program in the context of menu command hierarchies and find protectable expression in Lotus’ selection and arrangement of its command terms.

Conclusion

41. As it stands, the First Circuit decision will undoubtedly cause software companies to reevaluate their use of copyright protection. With menu command hierarchies deemed unprotectable methods of operation, software companies will seek alternative means of protecting their menu trees. The First Circuit’s holding that methods of operation are not amenable to abstraction also raises the concern that courts will view other aspects of user interfaces as means for operating programs, regardless of any original expression.
42. Weary of uncertain copyright protection, software companies may seek alternative means to protect their investments. With trade secret law also offering questionable protection, many software companies will undoubtedly attempt to patent their software. Software companies may assert copyright in their screen displays. Software companies may also look to state unfair competition law or to trade dress

protection to protect the menu trees. It should not be surprising that software companies will seek alternative protection for their programs as a result of the First Circuit's decision, because, as Judge Boudin's concurring opinion pointed out, "applying copyright law to computer programs is like assembling a jigsaw puzzle whose pieces do not quite fit."⁶³

ENDNOTES

- ¹ 33 F.3d 1526, 31 U.S.P.Q.2d (BNA) 1545 (Fed. Cir. 1994).
- ² 33 F.3d 1354, 31 U.S.P.Q.2d (BNA) 1754 (Fed. Cir. 1994).
- ³ 33 U.S.P.Q.2d (BNA) 1194 (Fed. Cir. 1994).
- ⁴ For a more in depth discussion of the impact of *Alappat* and *Warmerdam*, see Turkevich, *In re Alappat: The End of "Mathematical Algorithm" Confusion?*, 11 *COMPUTER LAW*. 9 at 1 (Sept. 1994).
- ⁵ *Alappat*, 33 F.3d at 1537, 31 U.S.P.Q.2d at 1551.
- ⁶ 35 U.S.C. § 112, para. 6 (1952).
- ⁷ *Alappat*, 33 F.3d at 1539, 31 U.S.P.Q.2d at 1553.
- ⁸ *Id.*
- ⁹ 16 F.3d 1189, 29 U.S.P.Q.2d (BNA) 1845 (Fed. Cir. 1994).
- ¹⁰ 16 F.3d at 1193, 29 U.S.P.Q.2d at 1850.
- ¹¹ 33 F.3d at 1540, 31 U.S.P.Q.2d at 1554.
- ¹² *Id.*
- ¹³ 684 F.2d 902, 214 U.S.P.Q. 682 (CCPA 1982).
- ¹⁴ 684 F.2d 912, 214 U.S.P.Q. 673 (CCPA 1982).
- ¹⁵ 618 F.2d 758, 205 U.S.P.Q. 397 (CCPA 1980).
- ¹⁶ *Alappat*, 33 F.3d at 1541, 31 U.S.P.Q.2d at 1555.
- ¹⁷ For example, the means element in claim 15 (a) corresponds to "an arithmetic logic circuit configured to perform an absolute value function, or equivalents thereof...." *Id.*
- ¹⁸ *Id.* at 1542, 31 U.S.P.Q.2d at 1556 (citing *Diamond v. Diehr*, 450 U.S. 175 (1981)).
- ¹⁹ *Id.*
- ²⁰ *Alappat*, 33 F.3d at 1543, 31 U.S.P.Q.2d at 1556.

- ²¹ *Id.* (citing *Diehr*, 450 U.S. at 192).
- ²² *Alappat*, 33 F.3d at 1544, 31 U.S.P.Q.2d at 1557.
- ²³ *Id.*
- ²⁴ *Id.*
- ²⁵ *Id.*
- ²⁶ *Alappat*, 33 F.3d at 1544, 31 U.S.P.Q.2d at 1557 (citing *Ex Parte Alappat*, 23 U.S.P.Q.2d (BNA) 1340, 1345 (BPAI 1992)).
- ²⁷ *Id.* at 1545, 31 U.S.P.Q.2d at 1558 (citing *Ex Parte Alappat*, 23 U.S.P.Q.2d (BNA) at 1345).
- ²⁸ *Id.* (citing *In re Freeman*, 573 F.2d 1237, 1247 n.11, 197 U.S.P.Q. (BNA) 464, 472 n.11 (CCPA 1978); *In re Noll*, 545 F.2d 141, 148, 191 U.S.P.Q. (BNA) 721, 726 (CCPA 1976)).
- ²⁹ *Alappat*, 33 F.3d at 1545, 31 U.S.P.Q.2d at 1558.
- ³⁰ *Id.* at 1545, 31 U.S.P.Q.2d at 1559.
- ³¹ *Lotus Dev. Corp. v. Borland Int'l, Inc.*, ___ F.3d ___ (1st Cir. 1995), 1995 U.S. App. LEXIS 4618 (Mar. 9, 1995) [hereinafter *Borland V*].
- ³² See *Lotus Dev. Corp. v. Borland Int'l, Inc.*, 788 F. Supp. 78 (D. Mass. 1992); *Lotus Dev. Corp. v. Borland Int'l, Inc.*, 799 F. Supp. 203 (D. Mass. 1992) [hereinafter *Borland II*]; *Lotus Dev. Corp. v. Borland Int'l, Inc.*, 831 F. Supp. 202 (D. Mass. 1993); *Lotus Dev. Corp. v. Borland Int'l, Inc.*, 831 F. Supp. 223 (D. Mass. 1993).
- ³³ *Borland II*, 799 F. Supp. at 217.
- ³⁴ *Id.* at 223.
- ³⁵ 982 F.2d 693 (2d Cir. 1992).
- ³⁶ See *id.* at 701.
- ³⁷ *Id.* at 707.
- ³⁸ *Id.*
- ³⁹ *Id.* at 710.
- ⁴⁰ See *Borland V*, at *24.
- ⁴¹ *Id.* at *25.
- ⁴² *Id.*
- ⁴³ 17 U.S.C. § 102(b) (1993).

⁴⁴ *Borland V*, at *26.

⁴⁵ *Id.*

⁴⁶ *Id.*

⁴⁷ See *id.* at *27.

⁴⁸ *Id.* at *30.

⁴⁹ See *id.* at *32-35.

⁵⁰ *Id.*

⁵¹ 499 U.S. 340 (1991).

⁵² *Id.* at 349-50.

⁵³ See *Borland V*, at *37.

⁵⁴ See *id.*

⁵⁵ 994 F.2d 1476 (10th Cir.), *cert. denied* 114 S.Ct. 307 (1993).

⁵⁶ *Borland V*, at *38.

⁵⁷ 17 U.S.C. § 102(b) (1993).

⁵⁸ *Id.* (emphasis added).

⁵⁹ 17 U.S.C. § 101 (1993).

⁶⁰ *Borland V*, at *35.

⁶¹ 17 U.S.C. § 102(b) (1993).

⁶² *Borland V*, at *41 (Boudin, J., concurring).

⁶³ *Borland V*, at *43 (Boudin, J., concurring).