

# COMMENT

## FEDERAL INTELLECTUAL PROPERTY PROTECTION FOR COMPUTER SOFTWARE AUDIOVISUAL LOOK AND FEEL: THE LANHAM, COPYRIGHT, AND PATENT ACTS

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## INTRODUCTION

The judiciary should brace itself for a surge of computer software-related litigation in the coming years. The Patent Office, once hostile toward claims involving software,<sup>1</sup> now commonly issues patents for software inventions.<sup>2</sup> As a result,

[t]he threat of [patent infringement] accusations is casting a pall over software development. . . . More companies are filing patents, and, most likely, will soon turn to litigation to guard them.<sup>3</sup>

This imminent litigation is apt to involve the "look and feel"<sup>4</sup> of computer software audiovisual displays,<sup>5</sup> as well as legal theories of pro-

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1. In 1966, the President's Commission on the Patent System recommended that computer programs *per se* be excluded from patent protection. This recommendation was based in part on the Patent Office's inability to deal with the administrative burden of examining such claims. THE PRESIDENT'S COMM. ON THE PATENT SYSTEM, "TO PROMOTE THE PROGRESS OF . . . USEFUL ARTS" IN AN AGE OF EXPLODING TECHNOLOGY 14 (1966). See also *Diamond v. Diehr*, 450 U.S. 175, 197 (1981) (Stevens, J., dissenting).

2. Maier, *Software Protection—Integrating Patent, Copyright and Trade Secret Law*, 69 J. PAT. & TRADEMARK OFF. SOC'Y 151, 157 (1987). Although the Patent Office does not track software-related patents as a separate category, attorneys and industry executives claim that top U.S. companies have doubled, and even quadrupled, the number of applications they file. Bulkeley, *Will Software Patents Cramp Creativity?*, Wall St. J., Mar. 14, 1989, at B1, col. 5. IBM alone files approximately 200 software-related patent applications each year. *Id.*

3. Bulkeley, *supra* note 2, at B1, col. 3. Patents are also used for defensive purposes. "We use patents principally as trading material for our own freedom of action in the marketplace." *Id.* at B1, col. 5 (statement of Roger S. Smith, IBM's director of intellectual property law). See also Fisher, *Software Industry in Uproar over Recent Rush of Patents*, N.Y. Times, May 12, 1989, at 1, col. 5.

4. Section I, *infra*, defines and describes this subject matter in greater detail. Briefly, the look and feel of computer software audiovisual displays refers to "the sequence of the screens and the choices presented, the layout of the screens, and the method of feedback to the user. . . ." *Broderbund Software, Inc. v. Unison World, Inc.*, 648 F. Supp. 1127, 1137 (N.D. Cal. 1986).

5. See, e.g., the following patents which, if litigated, are likely to involve issues of computer software look and feel: U.S. Patent No. 4,823,108 issued Apr. 18, 1989 to Gary W. Pope and assigned to Quarterdeck Office Systems, for an "improved display system and memory architecture and method for displaying images in windows on a video display"; U.S. Patent No. Re. 32,632, issued Mar. 29, 1988 to William D. Atkinson and assigned to Apple Computer, Inc., for a "display system" composed of pull-down menus used in conjunction with the Apple mouse; U.S. Patent No. 4,646,250 issued Feb. 24, 1987 to John F. Childress and assigned to IBM, for a "data entry screen for an interactive data entry system" that provides a means of identifying to the user fields where data may be entered and fields where data must be entered; U.S. Patent No. 4,486,857 issued Dec. 4, 1984 to Paul C. Heckel and assigned to Quickview Partners, for a "display system for the suppression and regeneration of characters in a series of fields in a stored record."

tection in addition to patent law. The means and scope of protection available for look and feel remain uncertain, yet the "stakes of this debate are enormous."<sup>6</sup>

This comment reviews the means and scope of protection for computer software look and feel available from federal statutory sources: trade dress protection under Section 43(a) of the Lanham Act of 1946,<sup>7</sup> the Copyright Act of 1976,<sup>8</sup> and the Patent Act of 1952.<sup>9</sup> In this context we see the full presence of competing interests in the structure of the nation's industrial policy. As a result, the analysis of one body of law helps answer questions in another.

Specifically, this comment proposes that the focus of the doctrine of functionality under Section 43(a) of the Lanham Act be adopted for analyzing the idea/expression dichotomy in copyright law, as well as the functional/nonfunctional distinction of design patent protection. Some courts applying the doctrine of functionality in trade dress cases treat the label "functional" as a legal conclusion, not a metaphysical fact. If trade dress protection for a product feature would unduly hinder competition, the feature is deemed functional and not protected. This form of analysis proves useful in the areas of copyrights and design patents. Further, it is consistent with the underlying rationale for such distinctions in each body of law: enough protection should be provided to reward innovation, but in no event should product protection become a market monopoly.

Section I of this comment describes computer software audiovisual look and feel, and examines the market for the technology. Section II explores the availability of trade dress protection for computer software look and feel under Section 43(a) of the Lanham Act. Section III discusses copyright protection and develops a proposal for refocusing the idea/expression analysis under the Copyright Act based on the doctrine of functionality under the Lanham Act. Section IV considers the validity of utility and design patents for computer software look and feel, and advances a proposal, based on the doctrine of functionality under the Lanham Act, for refocusing the functional/nonfunctional distinction of design patents. This comment is followed by an appendix which provides an illustrated guide to the technology discussed herein.

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6. Beutel, *Trade Dress Protection for the "Look and Feel" of Software: A New Source of Proprietary Rights Protection for the Software Industry?*, 5 *COMPUTER LAWYER*, Oct. 1988, at 2.

7. 15 U.S.C. § 1125(a) (1988). The Lanham Act codifies U.S. trademark law.

8. 17 U.S.C. §§ 101-810 (1988).

9. 35 U.S.C. §§ 1-376 (1982 & Supp. V 1987).

## I. THE LOOK AND FEEL OF COMPUTER SOFTWARE AUDIOVISUAL DISPLAYS

Computer programs manifest themselves in any number of ways.<sup>10</sup> Similarly, the term "look and feel," also known as "total concept and feel," has been used by copyright lawyers in a number of contexts.<sup>11</sup> Applied to computer software, it refers to the look and feel of written program instructions<sup>12</sup> as well as the look and feel of a program's audiovisual displays.<sup>13</sup> This comment is concerned only with the latter. This section will describe the technology at issue and consider it within its market context.

### A. The Technology

A computer program normally generates audiovisual displays as one means of communicating with the user, a part of the user interface. The user interface is the means by which the software and user interact to achieve the desired result.<sup>14</sup> Normally one uses a typewriter-like keyboard or a pointing device (such as a "mouse") to issue commands to the program or enter other information, including data. All or part of these commands may be visible on screen and available for selection from a "menu." Selecting a command may execute a function or

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10. Computer programs are usually seen as a set of statements or instructions. *See, e.g.*, 17 U.S.C. § 101 (1988). But courts and agencies must routinely distinguish specific manifestations of programs from programs *per se*. *See, e.g.*, *Diamond v. Diehr*, 450 U.S. 175 (1980) (algorithms contained in program instructions); *Broderbund Software, Inc. v. Unison World, Inc.*, 648 F. Supp. 1127 (N.D. Cal. 1986) (the look and feel of computer software audiovisual displays); *Synercom Technology, Inc. v. University Computing Co.*, 462 F. Supp. 1003 (N.D. Tex. 1978) (data input formats); NATIONAL COMMISSION ON NEW TECHNOLOGICAL USES OF COPYRIGHTED WORKS, FINAL REPORT 23 (1978) [hereinafter CONTU REPORT] (data bases, *e.g.* encyclopedias or dictionaries, stored in magnetic form and accessed by a computer program); 53 Fed. Reg. 38,110 (1988) (policy decision on copyrightability of digitized typefaces stored in computer programs).

11. *See, e.g.*, *Sid & Marty Krofft Television Prods. v. McDonald's Corp.*, 562 F.2d 1157 (9th Cir. 1977) (total concept and feel of television shows and commercials); *Roth Greeting Cards v. United Card Co.*, 429 F.2d 1106, 1110 (9th Cir. 1970) (total concept and feel of greeting cards).

12. Written programming instructions (or "source code") was the subject of *Whelan Assocs. v. Jaslow Dental Laboratory*, 797 F.2d 1222 (3d Cir. 1986), *cert. denied*, 479 U.S. 1031 (1987), and is outside the scope of this comment.

13. *See, e.g.*, *Atari, Inc. v. North American Philips Consumer Elecs. Corp.*, 672 F.2d 607, 614 (7th Cir. 1982), *cert. denied*, 459 U.S. 880 (1982); *Digital Communications Assoc. v. Softklone Distrib. Corp.*, 659 F. Supp. 449, 465 (N.D. Ga. 1987); *Broderbund Software, Inc. v. Unison World, Inc.*, 648 F. Supp. 1127 (N.D. Cal. 1986).

14. Other elements of the computer system, such as the keyboard, central processing unit, memory storage devices, video display, printers, etc., may be involved in the process of achieving the desired result. To the extent that they interact with the user directly, they are part of the user interface (*e.g.*, pressing keys on the keyboard to issue a command).

produce a list or "submenu" of additional choices. Executing a command usually results in visual feedback to the user on the computer's display. (Further information may be found *infra*, in the appendix, which provides an illustrated guide to computer software look and feel; it includes a description of four products that are, or have been, the subject of look and feel litigation.)

Look and feel includes individual audiovisual displays, as well as *dynamic* elements in the user interface.<sup>15</sup> Unlike a motion picture, a program's screens are usually designed to follow a functional, not chronological, order.<sup>16</sup> Look and feel is "the sequence of the screens and the choices presented, the layout of the screens, and the method of feedback to the user. . . ."<sup>17</sup> One manufacturer described the look and feel of its computer's user interface this way: "Just listing the elements . . . doesn't do it justice . . . it's the way they all work together—the *gestalt*."<sup>18</sup>

Listing the elements of the interface does not do it justice because copyright owners are not seeking protection for just the elements. Were that the case, "a plagiarist would escape by immaterial variations."<sup>19</sup> Rather, software developers seek protection against those competitors who use the same or similar audiovisual displays, presented in the same or similar structure, sequence, and organization. This explains the nebulous character of the term "look and feel," and the difficulty courts have in defining the scope of protection. "[A]s soon as literal appropriation ceases to be the test, the whole matter is necessarily at large. . . ."<sup>20</sup>

## B. The Market

Software has been a significant and growing element of the economy; by 1988, the worldwide market for software reached an estimated \$50 billion.<sup>21</sup> Software is produced by large and small firms, and there is a trend toward mass-marketed programs.<sup>22</sup> In spite of somewhat uncertain intellectual property protection, the market seems to have fared well. For example, while U.S. electronics manufacturers have suffered at

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15. For examples of dynamic aspects of a user interface, see *infra* Appendix, Figures 1 and 2, and accompanying text.

16. LaPlante, *Mac 'Look and Feel' Legal Issues Remain Unclear*, InfoWorld, Jan. 5, 1987, at 23.

17. Broderbund Software, Inc. v. Unison World, Inc., 648 F. Supp. at 1137.

18. J. Koltnow, *Who Can Use the Macintosh Interface?*, OUTSIDE APPLE, Oct. 1986 (emphasis added) (a newsletter published by Apple Computer, Inc., for outside developers).

19. *Nichols v. Universal Pictures Corp.*, 45 F.2d 119, 121 (2d Cir. 1930), *cert. denied*, 282 U.S. 902 (1931).

20. *Id.*

21. O'Connor, *Software Firms Fear Patents May Stifle Innovation*, San Jose Mercury News, Mar. 6, 1989, at 1A, col. 5.

22. CONTU REPORT, *supra* note 10, at 38.

the hands of offshore competition, U.S. software developers continue to dominate the world market.<sup>23</sup>

In the market, the look and feel of software may be of tremendous importance to the developer and is often of greater commercial value than the programming code that implements it.<sup>24</sup> While traditionally a program's look and feel has been an item of commercial value, micro-computer markets are moving toward "standard user interfaces" among programs,<sup>25</sup> *i.e.*, software developers apply the same principles and techniques of a single user interface to the various programs developed for a computer. In effect, standardized interfaces dramatically reduce the time it takes to learn a new application program. Similar functions and commands are executed similarly, so users do not have to learn a new means of interacting with every new program. The result is that, in markets with standard user interfaces, programs are *expected* to look and feel the same.

Given this understanding of the technology and its market, the following sections examine available forms of federal intellectual property protection for computer software audiovisual look and feel.

## II. THE LANHAM ACT OF 1946

[T]here is no part of the law which is more plastic than unfair competition, and what was not reckoned an actionable wrong 25 years ago may have become such today.

— Learned Hand<sup>26</sup>

The Lanham Act<sup>27</sup> codifies the federal law of trademarks in the United States. Section 43(a) of the Lanham Act<sup>28</sup> prohibits the false

23. See O'Connor, *Don't Expect Japan's Star to Rise on the Software Industry Horizon*, San Jose Mercury News, Feb. 12, 1989, at 1F, col. 1. "For all their efforts elsewhere, the Japanese have yet to unravel the enigmatic software business, and it doesn't appear likely they will anytime soon." *Id.* (assessment of Heidi Roizen, president of the Software Publishers Association). "The Japanese, Roizen maintains, don't grasp many aspects of this process and fail to deliver in key respects, such as user interfaces." *Id.* at 1F, col. 3.

24. Beutel, *supra* note 6, at 2 ("So called 'Human Factors Engineering' has become a critical and increasingly expensive aspect of new software development"); see also Ranney, *'Look and Feel' Discussed as Major Copyright Issue*, InfoWorld, Nov. 11, 1985, at 13.

25. See Bonner, *User Interface Wars: The Next Wave*, PC COMPUTING, Nov. 1988, at 74 ("By all accounts, standardized graphics-based operating environments will rule the computer marketplace by the early 1990's").

26. *Ely-Norris Safe Co. v. Mosler Safe Co.*, 7 F.2d 603, 604 (2d Cir. 1925) (Hand, J.), *rev'd*, 273 U.S. 132 (1927).

27. 15 U.S.C. §§ 1051-1127 (1988). Unlike the Patent and Copyright Acts, constitutional authority for the Lanham Act comes from the Commerce Clause. Trade-Mark Cases, 100 U.S. 82, 91 (1879). The Commerce Clause grants Congress the power "To regulate Commerce . . . among the several States. . . ." U.S. CONST. art. I, § 8, cl. 3.

28. 15 U.S.C. § 1125(a) (1988). The section prohibits:

[U]se in connection with any goods or services, . . . [of] a false designation of origin, or any false description or representation. . . .

designation of a product's origin or a false description of a product's contents.<sup>29</sup> One form of false designation of origin is trade dress misappropriation, *i.e.*, copying a competitor's trade dress<sup>30</sup> in order to capitalize on the reputation of the competitor.

Section 43(a) was intended to establish a uniform federal law of unfair competition.<sup>31</sup> Although there appears to be no case in which a Section 43(a) claim has been litigated in the context of computer software look and feel, one commentator predicts trade dress protection under Section 43(a) may soon be extended to such cases.<sup>32</sup> In light of that prediction, this section analyzes the scope of trade dress protection in the context of computer software look and feel.

A plaintiff seeking relief under a theory of trade dress misappropriation must establish that (1) the trade dress of their product has acquired a "secondary meaning"<sup>33</sup> in the marketplace; (2) there exists a likelihood of confusion on the part of consumers as to the source of the product; and (3) the appropriated elements are "nonfunctional" in nature.<sup>34</sup>

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*Id.* The Trademark Law Revision Act of 1988 amended Section 43(a), effective November 16, 1989, to clarify that false statements about another person's product are actionable. See S. REP. NO. 100-515, reprinted in 1988 U.S. CODE CONG. & ADMIN. NEWS 5577, 5603.

29. Beutel, *supra* note 6, at 2.

But [Section 43(a)] should be construed to include only such false descriptions or representations as are of substantially the same economic nature as those which involve infringement or other improper use of trademarks.

Bernard Food Indus. v. Dietene Co., 415 F.2d 1279, 1283 (7th Cir. 1969), *cert. denied*, 397 U.S. 912 (1970). See also Truck Equip. Serv. Co. v. Fruehauf Corp., 536 F.2d 1210, 1216 (8th Cir. 1976), *cert. denied*, 457 U.S. 1126 (1982).

30. Trade dress traditionally has been defined as the "packaging, size, shape, color, design, or name which has been affixed to goods or services." Beutel, *supra* note 6, at 3. See also Bauer, *A Federal Law of Unfair Competition: What Should Be the Reach of Section 43(a) of the Lanham Act?*, 31 UCLA L. REV. 671, 688 n.70 (1984). In recent years courts have extended trade dress protection to, among other things, imitation of the features of a product where those features are "nonfunctional." *Id.* at 688 n.71.

31. See Bauer, *supra* note 30, at 681.

32. Beutel, *supra* note 6, at 3.

33. A plaintiff might not be required to establish secondary meaning if the trade dress of their product is "inherently distinctive." See Chevron Chem. Co. v. Voluntary Purchasing Groups, Inc., 659 F.2d 695, 702 (5th Cir. 1981), *cert. denied*, 457 U.S. 1126 (1982). Accord *AmBrit Inc. v. Kraft, Inc.*, 812 F.2d 1531, 1535 (11th Cir. 1986), *cert. denied*, 481 U.S. 1041 (1987); *Blau Plumbing, Inc. v. S.O.S. Fix-it Inc.*, 781 F.2d 604, 608 (7th Cir. 1986).

34. See *Fuddruckers, Inc. v. Doc's B.R. Others, Inc.*, 826 F.2d 837, 842 (9th Cir. 1987). See also Beutel, *supra* note 6, at 3.

### A. Secondary Meaning

Trade dress has secondary meaning if, in the minds of the public, the primary significance of a product feature or term is to identify the source of the product rather than the product itself.<sup>35</sup>

There is no telling how long it might take consumers to associate a particular trade dress with a given producer. However, courts have noted that the velocity with which reputations may be acquired or lost differs among industries.<sup>36</sup>

Consumers of computer software might well associate the look and feel of certain software products with a particular developer as the source of that software. One commentator claims this is the case with the Macintosh interface, "[which is] clearly closely associated with Apple Computer."<sup>37</sup> This claim is untenable, however. Since virtually all software developers for the Macintosh have adopted Apple's standard user interface for Macintosh software products, the look and feel of such products tells consumers nothing as to who is the source of the product. The developer might be Apple Computer, Microsoft, or any of hundreds of different software developers who market products for the Macintosh computer. Consumers may associate the Macintosh interface with Apple Computer in some manner, but they will not assume that Apple Computer is the source of every product using the interface.

Secondary meaning is more likely to attach in computer markets such as that of the IBM PC, where there has not yet developed a *de facto* standard for user interfaces.<sup>38</sup> Perhaps the best example would be the

35. *Inwood Laboratories v. Ives Laboratories*, 456 U.S. 844, 851 n.11 (1981). Moreover, Professor McCarthy described secondary meaning this way:

Take as an example, a descriptive word like BEST for milk. . . . [The] descriptive connotation [*i.e.*, "highest quality"] is the "primary meaning" of the word "best." Extensive advertising and sales, over a period of time, by the seller of BEST milk may give the word "best" a new and different meaning to milk buyers. . . . That is, BEST serves as a commercial symbol identifying the milk of one source and serving to distinguish that milk from milk sold by all other dairies. . . . This new, trademark function of the descriptive word "best" is called the "secondary meaning" of "best". . . .

1 J. MCCARTHY, TRADEMARKS AND UNFAIR COMPETITION, § 15:2 (2d ed. 1984) (footnotes omitted).

36. *See, e.g., Stewart v. Hudson*, 222 F. 584 (E.D. Pa. 1915).

[B]ecause of the rapid development of the automobile business itself, it has produced such an alertness of mind toward everything connected with it, and a readiness and willingness to accept and adopt novelties, that there is the same relative difference in the speed with which the reputation of builders and others may be acquired and lost, and good wills grow up and decline.

*Id.* at 586.

37. Beutel, *supra* note 6, at 4.

38. This trend is away from this characteristic, however, even in the IBM PC market. *See Bonner, User Interface Wars: The Next Wave*, PC COMPUTING, Nov. 1988, at 72.

distinctive interface introduced by Lotus Development Corporation for its spreadsheet product, 1-2-3.<sup>39</sup> It was frequently referred to in the market as the "Lotus" interface, suggesting the required identification between the look and feel of the product and its developer for a finding of secondary meaning.<sup>40</sup>

## B. Likelihood of Confusion

Likelihood of confusion "exists when customers viewing the mark would probably assume that the product or service it represents is associated with the source of a different product or service identified by a similar mark."<sup>41</sup>

The likelihood of confusion test, however, does not require proof of actual confusion.<sup>42</sup> What actions a competitor must take to avoid confusion depend on the circumstances; clear labeling of the source may not be enough.<sup>43</sup>

It appears that consumers must be exposed to the look and feel of the relevant software products prior to purchase for the requisite likelihood of confusion to exist.<sup>44</sup> Stated another way, no confusion is likely to occur if consumers never have the opportunity to see, and subsequently be confused by, software audiovisual displays. In the case of mass-marketed software, consumers are generally less sophisticated, the products tend to be low-cost, and the marketing techniques of developers are similar.<sup>45</sup> Such consumers are less likely to have seen the product

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39. For an illustration and a description of 1-2-3, see *infra* Appendix, Figures 9-12, and accompanying text.

40. Over time, however, other developers appropriated the interface for various products. The subsequent failure of Lotus to prevent these appropriations could leave it vulnerable on two counts. First, the existence of non-Lotus products using the interface weakens the identification consumers make with respect to Lotus as the sole developer of products with the Lotus interface. Second, inaction by Lotus may subject it to a defense of laches.

41. *Fuddrucker, Inc. v. Doc's B.R. Others, Inc.*, 826 F.2d 837, 845 (9th Cir. 1987) (emphasis in original) (quoting *Lindy Pen Co. v. Bic Pen Corp.*, 725 F.2d 1240, 1243 (9th Cir. 1984) (Lindy Pen 1) (quoting *Alpha Industries*, 616 F.2d at 443) (emphasis added), *cert. denied*, 469 U.S. 1188 (1985)).

42. *Truck Equip. Serv. Co. v. Fruehauf Corp.*, 536 F.2d 1210, 1221 (8th Cir. 1976). However, it may be relevant evidence to support a finding of secondary meaning, *i.e.*, deliberate copying of trade dress suggests that it has secondary meaning, which is why it was copied. See *Fuddrucker, Inc. v. Doc's B.R. Others, Inc.*, 826 F.2d at 844.

43. Compare *Fuddrucker, Inc. v. Doc's B.R. Others, Inc.*, 826 F.2d 837 (different names of restaurants was not enough to obviate potential confusion) with *Digital Equip. Corp. v. C. Itoh and Co.*, 229 U.S.P.Q. 598 (D.N.J. 1985) (brand labelling sufficient to avoid confusion, in light of sophistication of end users, sales methods employed, and high costs of goods).

44. See 1 J. MCCARTHY, TRADEMARKS AND UNFAIR COMPETITION, § 8:2 (2d ed. 1984).

45. Beutel, *supra* note 6, at 4.

demonstrated before purchase. Purchasers may buy solely on the basis of recommendations,<sup>46</sup> packaging, advertising, etc., and never have the opportunity to be confused by the appearance of audiovisual displays.

Nonetheless, where consumers are exposed to the look and feel of software products prior to purchase<sup>47</sup> the potential likelihood of confusion exists.

### C. Doctrine of Functionality

The courts, not the Congress, have insisted that protected elements be limited to "nonfunctional" features.<sup>48</sup> The reason for this limitation is an overriding public policy of preventing market monopolization.<sup>49</sup> "[A] product feature is functional if it is essential to the use or purpose of the article or if it affects the cost or quality of the article."<sup>50</sup> Judicial inquiry is addressed to "whether the whole collection of elements taken together are functional."<sup>51</sup> Although courts refuse to protect functional features, "functional elements that are separately unprotectable can be protected together as part of a trade dress."<sup>52</sup>

Is computer software look and feel functional? As a product feature, it certainly plays a "functional" or "utilitarian" role. For almost all software programs, a user interface is essential to the use or purpose of software—by definition, it is the means by which the user interacts with the software to achieve the desired result.<sup>53</sup>

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46. Perhaps "vicarious" exposure might result, when the person on whom the buyer relies for a recommendation has been exposed to the product's look and feel in some way.

47. For example, exposure may take the form of a product demonstration before purchase, or "screen shots" in brochures, advertising, or press reviews of the product.

48. See *In re Morton-Norwich Prods.*, 671 F.2d 1332, 1336 (C.C.P.A. 1982); *In re Mogen David Wine Corp.*, 328 F.2d 925, 932 (C.C.P.A. 1964) (Rich, J., concurring).

49. See *In re Deister Concentrator Co.*, 289 F.2d 496, 504 (C.C.P.A. 1961); *Truck Equipment Serv. Co. v. Fruehauf Corp.*, 536 F.2d 1210, 1219-20 n.12 (8th Cir. 1976). See also Bauer, *supra* note 30, at 688 n.71.

A monopoly exists when there is only one seller. See R. COOTER & T. ULEN, *LAW AND ECONOMICS* 37 (1988). "Market" monopoly must be distinguished from what might be called a "product" monopoly. Statutory protection under the Lanham, Copyright, and Patent Acts secures certain exclusive rights in a product to producers, authors, and inventors. They are protected as the sole source of the product, and therefore have a monopoly on the product. Where barriers, such as legal protection, make it impossible for competing firms to enter the market with the same *type* of product, the producer, author, or inventor has a *market monopoly*, *i.e.*, the supplier and the industry are the same. See *id.* at 38.

50. *Inwood Laboratories v. Ives Laboratories*, 456 U.S. 844, 850 n.10 (1982).

51. *Fuddrucker, Inc. v. Doc's B.R. Others, Inc.*, 826 F.2d 837, 842 (9th Cir. 1987).

52. *Id.*

53. See *supra* Section I.A.

Perhaps specific features need to be defined more precisely. For example, are "pull-down" menus<sup>54</sup> essential to the use or purpose of software? Probably not. Products have displayed menus in many different ways, and some display no menu at all.<sup>55</sup> They do not affect the "cost" of the product, in the sense of reducing production costs. On the other hand, pull-down menus, as well as look and feel generally, may be said to affect the quality of the product in terms of ease of use, efficacy, or salability.

This "plain language" application of the rule shows that the line between functionality and nonfunctionality "is not brightly drawn in every case."<sup>56</sup> In fact, the distinction is unworkable unless one recognizes, as Judge Rich did in *In re Morton-Norwich Products, Inc.*,<sup>57</sup> that the designation is a legal conclusion, rather than the prerequisite to one. It is necessary to distinguish between *de facto* functionality and *de jure* functionality.<sup>58</sup>

*De facto* functionality is functionality in the lay sense, *i.e.*, directed toward a use or purpose. As noted above, a feature that is *de facto* functional may or may not receive protection. Similarly, a feature that at one point is nonfunctional may become functional later.<sup>59</sup> *De jure* functionality refers to the legal conclusion: what product features may be copied (*de jure* functional) and what features may be protected (*de jure* nonfunctional).

Given that *de jure* functionality is a conclusion, the question remains as to what considerations precede the conclusion. A single, clear criterion emerges from the case law: whether protection against imitation will unduly hinder the competitor in competition.<sup>60</sup> Courts seek

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54. For an illustration and description of pull-down menus, see *infra* Appendix, Figure 14, and accompanying text.

55. Examples of programs that have no menus include operating systems such as MS-DOS and UNIX, some programming languages such as BASIC on the IBM PC, and entertainment programs such as "text adventures." The IBM PC version of WordPerfect, a popular word processor, displays no main menu, although submenus appear after initial commands are selected.

56. *Truck Equip. Serv. Co. v. Fruehauf Corp.*, 536 F.2d 1210, 1218 (8th Cir. 1987).

57. 671 F.2d 1332 (C.C.P.A. 1982).

58. See *In re Morton-Norwich Prods.*, 671 F.2d at 1337.

59. See, *e.g.*, *Inwood Laboratories v. Ives Laboratories*, 456 U.S. 844 (1981) (arbitrary colors, chosen for capsules containing a drug, came to be used by resellers and consumers to distinguish dosages of the drug). In *Inwood Laboratories*, the Supreme Court upheld the district court's finding that the feature was functional, and now that the patent for the drug had expired manufacturers of generic products could produce the drug and had a "legitimate reason" for using the same colors. *Id.* at 858 n.20. It seems unlikely, however, that the result would be the same if the plaintiff's drug had just been released with arbitrary colors, before the market had come to rely on the color markings as a way to distinguish dosages.

60. See, *e.g.*, *Aro Mfg. Co. v. Convertible Top Co.*, 377 U.S. 476, 522 (1963) ("[T]o grant . . . a legally protected monopoly offends the constitutional plan of a competitive

to balance and reconcile the public's interest in making use of a design, the public's interest in "producer identification,"<sup>61</sup> and the originator's interest in being the sole vendor.<sup>62</sup>

This criterion is consonant with the rationale for the doctrine of functionality: to prevent market monopolization.<sup>63</sup> If trade dress protection is available only when such protection allows for effective market competition, then no monopolies will result. Consequently, where competitors may fairly compete without imitating trade dress, protection should be extended to such trade dress *without regard* to metaphysical distinctions between *de facto* functional and *de facto* nonfunctional features.

Applying this test to the look and feel of computer software, we find that situations exist where competition might, and might not, be unduly hindered by trade dress protection. For example, in markets with standard user interfaces, consumers are likely to insist that products adhere to these standards.<sup>64</sup> Products with similar capabilities following the same interface guidelines are expected to have a similar appearance and organization. Broad trade dress protection would prevent effective competition among similar products and result in excessive market power for a vendor. Opportunities for protection in such markets must necessarily be very narrow.

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economy free from patent monopolies except where there are patentable 'Discoveries.'") (Black, J., dissenting); *Sicilia Di Ri Biebow & Co. v. Cox*, 732 F.2d 417, 429 (5th Cir. 1984) (ultimate inquiry in functionality analysis is whether protecting a feature will hinder competition), *reh'g denied*, 736 F.2d 1526 (5th Cir. 1984)); *In re Morton-Norwich Prods.* 671 F.2d at 1341 ("the effect upon competition 'is really the crux of the matter'"); *Truck Equip. Serv. Co. v. Fruehauf Corp.*, 536 F.2d at 1218 ("The question in each case is whether protection against imitation will hinder the competitor in competition"); *Pagliari v. Wallace China Co.*, 198 F.2d 339, 343 (9th Cir. 1952) ("Under such circumstances, since effective competition may be undertaken without imitation, the law grants protection"); *Avery & Sons v. Meikle & Co.*, 81 Ky .73, 102, 4 Ky. L. Rptr. 759, 776 (1883) ("Care should be taken not to interfere with the freedom of trade, or to foster monopolies . . .").

61. See R. COOTER & T. ULEN, *supra* note 49, at 144-45. The ability to identify a product's producer reduces a consumer's search cost. Moreover, it is probably the case that a generic item is of lower quality than a brand name item. For example, the average quality of various consumer goods fell in the Soviet Union after the abolition of marks identifying the producing plant. *Id.* at 144.

On the other hand, some economists say that resources devoted to product differentiation amount to a social waste, obscuring what are otherwise identical products. *Id.* at 145.

62. *In re Morton-Norwich Prods.*, 671 F.2d at 1340; *Vaughn Novelty Mfg. Co. v. G. G. Green Mfg. Corp.*, 202 F.2d 172, 176 (3d Cir. 1953), *cert. denied*, 346 U.S. 820 (1953).

63. See *supra* note 49, and accompanying text.

64. See *supra* Section I.B., for a discussion of the benefits of a standard user interface. For these reasons consumers are likely to shun non-standard products.

Where no standard user interface exists, the argument that user interface features are *de jure* nonfunctional is much stronger. However, the existence of alternative user interfaces is not conclusive. If an interface is particularly efficient, or if for other reasons the only means of effective competition is through imitation,<sup>65</sup> then no protection should be granted.

It appears that Section 43(a) provides a viable cause of action in certain situations, particularly where the appropriation takes place in a market with no standard user interface, where consumers are exposed to the look and feel of software products prior to purchase, and where the grant of protection would not unduly burden competition in the relevant market.

However, the potential importance of trade dress protection for computer software look and feel is limited by two factors. First, copyright protection is likely to remain more attractive as a means of protection to software developers than trade dress. Copyright protection is available at little or no cost, while trade dress protection is not available until sufficient time and marketing efforts have established the necessary secondary meaning. While trade dress protection lasts indefinitely, the minimum duration of copyright protection is already much longer than the expected useful life of most software products.<sup>66</sup> Further, the trade dress rubric of "confusion as to source of the product" results in a narrower scope of protection than copyright.<sup>67</sup>

Second, a trade dress theory of protection is tenable only in a software market without a standard user interface; historically, the IBM PC market has been such a market. The present trend toward standard user interfaces,<sup>68</sup> however, will necessarily tend to limit Section 43(a) claims alleging misappropriation of computer software audiovisual look and feel.

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65. For instance, it may be costly for users to invest the money and time to learn a new user interface. Where a product has enjoyed a very large market share, and where retraining costs are sufficiently high, the market may be unwilling to accept competitive products unless they offer a similar user interface. If protection is granted here, the vendor is given a *de facto* monopoly.

Such a result is, however, inappropriate under trademark law. No returns above those from producer identification should result from trademark protection. See Burgunder & Heckman, *An Emerging Theory of Computer Software Genericism*, 2 HIGH TECH. L.J. 229, 230 (1987).

66. See CONTU REPORT, *supra* note 10, Appendix H, at H-3 (studies commissioned by CONTU recommended a duration of copyright protection from two to 14 years).

67. *Id.* at 44-45.

68. See Bonner, *supra* note 25, at 74.

### III. THE COPYRIGHT ACT OF 1976

Copyrightable subject matter is described by the Copyright Act as: original works of authorship fixed in any tangible medium of expression, now known or later developed, from which they can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device.<sup>69</sup>

Two categories of copyrightable works applicable to computer programs include "literary works" and "audiovisual works."<sup>70</sup> Literary works include the written programming instructions of software as stored on the computer.<sup>71</sup> Computer software video displays are considered audiovisual works.<sup>72</sup>

Audiovisual works are defined as a "series of related images which are intrinsically intended to be shown by the use of machines. . . ." <sup>73</sup> As such, all aspects of computer software displays would ordinarily come within the scope of copyright protection; this includes audiovisual look and feel.<sup>74</sup>

There is an affirmative statutory limit on otherwise copyrightable subject matter, however, and it is discussed in the following section.

#### A. The Idea/Expression Dichotomy

Section 102(b) of the Copyright Act provides:

In no case does copyright protection . . . extend to any idea, procedure, process, system, method of operation, concept, principle, or discovery. . . .<sup>75</sup>

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69. 17 U.S.C. § 102 (1988). The enabling constitutional grant of authority comes from the Patent and Copyright Clause of the Constitution: "To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries. . . ." U.S. CONST. art. I, § 8, cl. 8. This clause contains a grant of authority as well as limitations on that power. See *Graham v. John Deere Co.*, 383 U.S. 1, 5 (1965).

70. See 17 U.S.C. §§ 101, 102 (1988).

71. See, e.g., *Whelan Assocs. v. Jaslow Dental Laboratory*, 797 F.2d 1222 (3d Cir. 1986).

72. See *Data E. USA, Inc. v. EPYX, Inc.*, 862 F.2d 204 (9th Cir. 1988); *Williams Elecs., Inc. v. Artic Int'l, Inc.*, 685 F.2d 870 (3d Cir. 1982); *Broderbund Software, Inc. v. Unison World, Inc.*, 648 F. Supp. 1127 (N.D. Cal. 1986).

73. 17 U.S.C. § 101 (1988).

74. This follows from Professor Nimmer's conclusion that ideas in written form are a writing within the meaning of the Constitution. See *infra* note 76. Even if look and feel involves a synergism of displays, or a "gestalt," it is nonetheless embodied within an audiovisual work.

75. 17 U.S.C. § 102(b) (1988). This section was intended to codify, unchanged, the common law idea/expression dichotomy as a limit on copyrightable subject matter. See H.R. REP. No. 94-1476, 94th Cong., 2d Sess. 56-57, reprinted in 1976 U.S. CODE CONG. & ADMIN. NEWS 5659, 5670 [hereinafter H.R. REP.].

This limit on copyrightable subject matter is known as the "idea/expression" dichotomy,<sup>76</sup> and has proven itself to be extremely difficult to administer.<sup>77</sup> Judge Learned Hand's famous "levels of abstraction" test<sup>78</sup> shows how a line might be drawn, but does not offer guidance on where to draw it.<sup>79</sup> "Obviously, no principle can be stated as to when an imitator has gone beyond copying the 'idea,' and has borrowed its 'expression.' Decisions must therefore inevitably be *ad hoc*."<sup>80</sup>

The difficulty in distinguishing idea from expression should come as no surprise. How is it possible for an idea to exist, except in some expression? How is it possible to excise an idea from its expression without recasting it into another expression, for example by stating the idea more abstractly, or contemplating it in a different medium?<sup>81</sup>

The "unprincipled" nature of these determinations forces courts to grapple with a metaphysical issue.<sup>82</sup> They are set adrift without guidance as to how to separate by law what seems inseparable in fact. *Ad hoc* determinations where no clear criteria exist leave attorneys unable to map for their clients reliable bounds of protection. Further, the uncertainty of protection diminishes the incentive effect for authors and hinders the promotion of useful arts and sciences.

This need not be the case.

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76. This limitation on copyrightable subject matter is an issue of statutory application. Professor Nimmer maintains this is not a requirement of the Copyright Clause of the Constitution:

[T]here seem to be no valid constitutional grounds for denying to an idea the status of a writing. . . . Within this frame of reference it seems axiomatic, hardly requiring argument or authority, to conclude that an idea in written form is a writing.

1 M. NIMMER, NIMMER ON COPYRIGHT § 1.08[D] (1988).

77. See *Peter Pan Fabrics, Inc. v. Martin Weiner Corp.*, 274 F.2d 487 (2d Cir. 1960) (L. Hand, J.); see also Knowles & Palmieri, *Dissecting Krofft: An Expression of New Ideas in Copyright?*, 8 SAN FERN. V.L. REV. 109, 126 (1980); Comment, *Broderbund Software, Inc. v. Unison World, Inc.: "Look and Feel" Copyright Protection for the Display Screens of an Application Microcomputer Program*, 13 RUTGERS COMPUTER & TECH. L.J. 105, 108 (1987).

78. See *Nichols v. Universal Pictures Corp.*, 45 F.2d 119, 121 (2d Cir. 1930).

79. See 3 M. NIMMER, NIMMER ON COPYRIGHT § 13.03[A] (1988).

80. *Peter Pan Fabrics, Inc. v. Martin Weiner Corp.*, 274 F.2d at 489 (emphasis added).

81. "O body swayed to music, O brightening glance, How can we know the dancer from the dance?" W. B. YEATS, *Among School Children*, in W. B. YEATS: THE POEMS 217 (Finneran ed. 1983).

82. Whether particular ideas and expressions have merged has been called a "somewhat metaphysical issue." *Apple Computer, Inc. v. Franklin Computer Corp.*, 714 F.2d 1240, 1253 (3d Cir. 1983), cert. dismissed, 464 U.S. 1033 (1984).

## B. Refocusing the Idea/Expression Analysis

This comment proposes a new focus for analyzing the limits of copyrightable subject matter found in Section 102(b).<sup>83</sup> The proposal is this: courts should distinguish a "de jure idea" from a "de facto idea." Where the grant of copyright protection to a feature would unduly hinder competition within the market for a writing, the feature should be held a *de jure* idea and dedicated to the public domain. Protection would unduly hinder competition when society's interest in competitive markets outweighs society's interest in rewarding the author.

This proposal reflects a test of balancing, not metaphysics, that is required by the very rationale of distinguishing idea from expression. It is consonant with the purpose of copyright law: to create the most efficient balance between society's interest in competitive markets, and incentives<sup>84</sup> for the production and dissemination of information.<sup>85</sup> Further, it is fully consistent with the Copyright Clause of the Constitution. As Justice O'Connor states:

The Patent [and Copyright] Clause itself reflects a balance between the need to encourage innovation and the avoidance of monopolies

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83. A similar proposal advocates the adoption by copyright law of trademark's doctrine of genericism in the context of computer software. See Burgunder & Heckman, *An Emerging Theory of Computer Software Genericism*, 2 HIGH TECH. L.J. 229 (1988). Proving "genericism" would require a more rigorous showing of anticompetitive effect than would "de jure functionality" or its counterpart, "de jure idea" as discussed here.

84. Conventional economics theory holds that where it is costly to prevent non-paying beneficiaries from consuming a commodity, the private market may provide sub-optimal amounts of the public good. R. COOTER & T. ULEN, *supra* note 49, at 113. However, "the standard theory ignores the possibility that there may be alternative, less direct means" for rewarding innovation. *Id.* at 114. In the case of software look and feel, developers may be sufficiently motivated to innovate where their main interest is selling a software program, or computer, rather than a user interface *per se*. See Breyer, *The Uneasy Case for Copyright: A Study of Copyright in Books, Photocopies, and Computer Programs*, 84 HARV. L. REV. 281, 344-345 (1970).

85. See *Whelan Assocs. v. Jaslow Dental Laboratory*, 797 F.2d 1222, 1235 (3rd Cir. 1986); *Digital Communications Assoc. v. Softklone Distributing Corp.*, 659 F. Supp. 449, 458 (N.D. Ga. 1987). To the extent that there are other purposes of copyright law this proposal is not inconsistent. Other purposes are "to promote learning, culture and development." *Whelan Assocs. v. Jaslow Dental Laboratory*, 797 F.2d at 1235.

The purpose is to grant enough, but not too much, protection such that, in the long term, optimal amounts of "ideas" are produced and available for public use. See R. COOTER & T. ULEN, *supra* note 49, at 135.

A copyright law, . . . may represent one way of resolving the conflict between the need for book revenues high enough to secure adequate production and book prices low enough not to interfere with widespread dissemination of what is written.

Breyer, *supra* note 84, at 282.

See also *infra* note 159 (discussing whether a further purpose of the idea/expression dichotomy might be to make patentable and copyrightable subject matter mutually exclusive).

which stifle competition without any concomitant advance in the "Progress of Science and the useful Arts."<sup>86</sup>

This general form of analyzing the scope of copyrightable subject matter has several advantages. First, it focuses on considerations that courts are much more experienced at resolving, making it administrable.<sup>87</sup> Second, the focus in no way departs from the wording or the purpose of the Copyright Act; rather this proposal adds the necessary gloss to Section 102(b). Third, this analysis will promote the progress of useful arts and sciences by balancing the need to encourage innovation with the need to foster markets for such work. Finally, this analysis will result in greater predictability of protection.<sup>88</sup>

Applied to computer software look and feel, the proper analysis requires placing the subject matter in the context of its market. Where a market has adopted a standard user interface, the use of such standards in software design becomes essential to effective competition. In such a market, courts should recognize a virtual *per se* rule: the general look and feel of computer software audiovisual displays is a *de jure* idea and unprotectable.<sup>89</sup>

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86. *Bonito Boats, Inc. v. Thunder Craft Boats, Inc.*, 109 S.Ct. 971, 975 (1989) (O'Connor, J.).

87. Evaluating the effects on competition should be more familiar territory for courts than deciding whether a window "exploding" from an icon in a computer display is an idea or the expression of one. (For an illustration of this phenomenon, see *infra* Appendix, Figure 14, and accompanying text.)

88. While decisions would continue to be *ad hoc*, they would involve judicial inquiry into competition, not metaphysics, and consequently litigants should be better able to predict trial outcomes.

Predictability may be all there is to the law. "The prophecies of what the courts will do in fact, and nothing more pretentious, are what I mean by the law." O.W. HOLMES, JR., COLLECTED LEGAL PAPERS 173 (1920).

Further, predictability of protection will itself promote free trade.

One well-confirmed result in the literature on bargaining is that bargainers are more likely to cooperate when their rights are clear, and less likely to agree when their rights are ambiguous.

R. COOTER & T. ULEN, *supra* note 49, at 100 (footnote omitted).

89. This approach is appropriate in a dispute between competing software developers in a single computer market, such as that of the Macintosh. A more difficult question arises in a case where, for example, a company such as Apple Computer claims software developers for other computers infringe the copyrights Apple holds in software products it developed for its computers. Enforcing Apple's copyright claims will not unduly hinder competition in the market for Apple's software products (since the alleged infringers have developed products for other computers). However, since Apple is asserting its rights beyond the Macintosh market, it is appropriate to analyze the competitive effects of protection on all markets in which Apple asserts its claims. (That greater market sphere of "microcomputers," however, cannot be characterized at this time as having adopted a standard user interface; where such alternative means of producing competitive user interfaces exists, protection for Apple's copyrights is less likely to unduly burden competition.)

More specifically, consider two uses of "icons" in the Macintosh interface. "Disk" icons<sup>90</sup> display a small graphic image selected by the developer that appears on screen and identifies the disk when it is inserted into the computer. The graphic images can be fanciful. Another form of icon, a "tool" icon,<sup>91</sup> exists when a program is running, and the icon represents a certain command or function that is available. For instance, a "paint" program for drawing pictures might have a column of icons that represent tools to draw boxes, circles, ovals, freehand strokes, lines, and so on. The purpose of these icons is to represent the capability without words, using only small pictures.

Protection for original disk icons would probably not hinder competition at all. Protection for original tool icons might present a different problem. There may be very few ways to represent a software command or function, or there may be many ways to represent it but only a few that effectively convey to a user the command or function represented by the icon. If protection for certain tool icons would allow a less-than-acceptable number of developers to monopolize the only effective means of expressing the capability of a certain tool, the tool icons should be a *de jure* idea and unprotectable.<sup>92</sup>

Where a market has no standard user interface, however, competitors can generally compete effectively without copying a competing product's look and feel. The wide competitive playing field justifies a wider scope of protection for authors in such markets. On the other hand, circumstances may exist in these markets where protection would nonetheless unduly hinder competition. The extraordinary success of a product might result in formidable barriers to entry. For example, a vast installed base of users may be unwilling to purchase similar products with different user interfaces because of retraining costs. At some point, society's interest in competition in that market will no longer tolerate the

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90. For an illustration and description of the type of disk icons discussed here, see *infra* Appendix, Figure 14, and accompanying text.

91. For an illustration and description of a tool icon, see *infra* Appendix, Figure 16, and accompanying text.

92. At this point it is worthwhile to distinguish the analysis of this proposal from a traditional inquiry of whether idea and expression have merged. Merger denies protection to an expression whenever there is only one way, or very few ways, to express an idea. This comment proposes an analysis that would deny protection when, for any reason, such protection would unduly hinder competition. There may be *de facto* ideas capable of expression in myriad ways, only one of which is palatable to the market. Similarly, there may be a *de facto* idea that can be expressed in only one way, but because of the availability of substitutes or for other reasons is protectable because such protection will not unduly hinder competition in a generally defined market.

This "icon" example demonstrates how a competition-oriented analysis produces results that are consistent with precedent, yet avoid the problems of metaphysical analysis.

use of copyright protection as a means of perpetuating market domination.

In conclusion, copyright law should shield original works of authorship; that shield should not, however, be misapplied as a barrier to market entry.

#### IV. THE PATENT ACT OF 1952

The law of patents in the United States is governed by the Patent Act of 1952.<sup>93</sup> Two different forms of patents are relevant to this issue and will be discussed separately: utility patents and design patents.

##### A. Utility Patents

Thomas Jefferson<sup>94</sup> drafted the first description of proper subject matter for utility patents, and the substantive statutory requirements have seen little change since the Patent Act of 1793.<sup>95</sup> Section 101 of the Patent Act of 1952 defines patentable subject matter as "any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof. . . ."<sup>96</sup> Committee reports accompanying the Patent Act indicate that Congress intended statutory subject matter to include "anything under the sun that is made by man."<sup>97</sup>

This broad scope of patentability is narrowed, however. Congress has relied on the Patent Office and the judiciary to resolve questions of subject matter patentability on a case-by-case basis, providing only the barest statutory guidance.<sup>98</sup> Consequently, subject matter patentability is shown by coming within the plain language of the statute and avoiding areas excepted by the judiciary.<sup>99</sup>

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93. 35 U.S.C. §§ 101-376 (1982 & Supp. V 1987).

94. While Jefferson was active in establishing the patent system after the adoption of the Constitution, authorship of the empowering constitutional provision has been attributed to James Madison and Charles C. Pinckney. See Fenning, *The Origin of the Patent and Copyright Clause of the Constitution*, 11 J. PAT. OFF. SOC'Y 445 (1930).

95. Annotation, *Patentable Subject Matter*, 65 L. Ed. 2d 1197, 1200 (1980).

96. 35 U.S.C. § 101 (1982).

97. Annotation, *supra* note 95, at 1202.

98. Davis, *Computer Programs and Subject Matter Patentability*, 6 RUTGERS J. OF COMPUTERS & LAW 1, 7 (1977).

99. See, e.g., *Parker v. Flook*, 437 U.S. 584, 588 (1977) ("The plain language of Section 101 does not answer the question").

Patent applications for computer programs are generally made in the form of "process" claims.<sup>100</sup> The following sections will analyze such claims and the relevant judicial doctrines of exclusion.

### 1. PROCESS CLAIMS

The Patent Act defines process to mean "process, art or method, and includes a new use of a known process, machine, manufacture, composition of matter, or material."<sup>101</sup> A dictionary definition of the term includes "a particular method of doing something, generally involving a number of steps or operations."<sup>102</sup>

A plain reading of the statute suggests that the *de facto* functional, interactive aspects of a program's user interface constitute a process—for example, the process of making a greeting card in *Broderbund Software, Inc. v. Unison World, Inc.*<sup>103</sup> Computer "implemented processes are encompassed within 35 U.S.C. [§] 101 under the same principles as other machine implemented processes, subject to judicially determined exceptions. . . ."<sup>104</sup> The question, then, is whether the judiciary will except such a process from the statutory definition.<sup>105</sup>

### 2. JUDICIALLY DETERMINED EXCEPTIONS

Three doctrines potentially relevant to computer software look and feel exclude mathematical algorithms, printed matter, and mental steps from patentable subject matter.<sup>106</sup>

100. U.S. PATENT AND TRADEMARK OFFICE, MANUAL OF PATENT EXAMINING PROCEDURE § 2106 (5th ed. rev. 9, Sept. 1988).

An "apparatus" claim will be analyzed as a process claim unless it can be demonstrated the apparatus claim is drawn to a specific machine, distinguishable from other machines capable of performing the identical functions. *In re Pardo*, 684 F.2d 912, 916 n.6 (C.C.P.A. 1982); see also *In re Walter* 618 F.2d 758 (C.C.P.A. 1980). For the purposes of this paper, only the general process claim analysis will be discussed, recognizing a slightly different analysis might apply where a claim is drawn to a specific apparatus.

101. 35 U.S.C. § 100(b) (1982).

102. WEBSTER'S NEW UNIVERSAL UNABRIDGED DICTIONARY 1434 (2d ed. 1983).

103. 648 F. Supp. 1127 (N.D. Cal. 1986). Part of this process is illustrated and described in the appendix; see *infra* Appendix, Figures 1-7.

104. *In re Johnson*, 200 U.S.P.Q. 199, 210-11 (C.C.P.A. 1978). See also PATENT AND TRADEMARK OFFICE, *supra* note 100.

105. The look and feel-related patents that have been issued are evidence that the Patent Office considers such processes proper subject matter for utility patents. See *supra* note 5.

106. In particular factual situations, other doctrines of exclusion might be implicated, such as those pertaining to abstract ideas or methods of doing business.

a. Mathematical algorithms

This doctrine has been relevant in the few cases on patents involving software to reach the Supreme Court. The Court's last decision on the issue, *Diamond v. Diehr*,<sup>107</sup> was the first Supreme Court case in which a patent including a computer program was upheld as within Section 101 patentable subject matter. In *Diehr*, the Court applied the test of *In re Freeman*.<sup>108</sup>

The first step of the *Freeman* test is to determine whether the claim directly or indirectly states an algorithm.<sup>109</sup> If so, the second step is to analyze the claim to ascertain whether, in its entirety, it wholly preempts the use of that algorithm (in which case it is nonstatutory subject matter).<sup>110</sup> In the case of look and feel, we never reach the second step of the *Freeman* test. A user interface does not directly or indirectly state a (mathematical) algorithm. Its implementation may involve the use of mathematical formulae in programming, but it would probably not depend on any one algorithm as a means for implementing the screen displays.<sup>111</sup> Such programming issues are transparent to the user and unnecessary in describing or implementing the process.

*Diehr*, as well as the Patent Office's Manual of Patent Examining Procedure,<sup>112</sup> provides guidelines on the patentability of computer programs when they involve an algorithm. They are silent, however, on how to analyze claims that do not involve algorithms. The conclusion is that this doctrine, which involves the only Supreme Court pronouncements on the patentability of software-related inventions, will not exclude computer software look and feel from patentable subject matter.

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107. 450 U.S. 175 (1981) (process for curing rubber which includes in several steps the use of a mathematical formula and a programmed digital computer).

108. 573 F.2d 1237 (C.C.P.A. 1978).

109. The Court has used the term "algorithm" in the sense of a "procedure for solving a given type of mathematical problem. . . ." *Gottschalk v. Benson*, 409 U.S. 63, 65 (1972).

110. *In re Freeman*, 573 F.2d at 1245; see also White & Redano, *Patent Opportunities for Software-Related Subject Matter*, 4 COMPUTER LAWYER, July 1987, at 13.

The second step of the *Freeman* test has been modified by *In re Abele*, 684 F.2d 902 (C.C.P.A. 1982) and *In re Walter*, 618 F.2d 758 (C.C.P.A. 1980).

111. See, e.g., *Broderbund Software, Inc. v. Unison World, Inc.*, 648 F. Supp. 1127 (N.D. Cal. 1986), where defendant copied plaintiff's audiovisual look and feel without, for all intents and purposes, access to plaintiff's source code; defendant "reverse engineered" the program.

112. U.S. PATENT AND TRADEMARK OFFICE, *supra* note 100.

b. Printed matter

In the case of computer programs, both the written source code and the audiovisual displays are arguably printed matter. Historically, patents were denied when the sole distinction over the prior art involved printed matter.<sup>113</sup> The rationale was that printed matter did not relate to the physical structure of the invention and therefore was not within the scope of the patent statute.<sup>114</sup>

Where printed matter relates to the physical structure of the invention, however, courts have upheld the patentability of such inventions. For example, an accounting system utilizing columns covered with movable strips of paper was treated as a "structure," rather than printed matter, and held to be patentable.<sup>115</sup> Similarly, an educational mathematical device in the form of a band containing digits printed at certain intervals could not be excluded from patentable subject matter simply because the differences between the invention and prior art were to be found in the content of printed matter.<sup>116</sup>

Computer software source code and audiovisual displays play active, essential, *de facto* functional roles in the operation of the computer and any process implemented thereby. In particular, dynamic audiovisual displays in a user interface play a structural role analogous to the movable strips of paper in *In re Hansen*.<sup>117</sup> Consequently, as a general rule, the look and feel of computer software should not be excluded from patentable subject matter on the grounds that the invention takes the form of printed matter.<sup>118</sup>

c. Mental steps

In the 1940's the "mental steps" doctrine gained express recognition in the Patent Office, Ninth Circuit Court of Appeals, and the Court of Customs and Patent Appeals, and excluded processes composed of

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113. See *In re Hansen*, 154 F.2d 684, 686 (C.C.P.A. 1946); *In re Sterling*, 70 F.2d 910, 912 (C.C.P.A. 1934). See also *In re Miller*, 418 F.2d 1392, 1396 (C.C.P.A. 1969).

114. *In re Hansen*, 154 F.2d at 686.

In early decisions, it appears that most attempts to patent printed matter involved arrangements of information designed to implement a business system; consequently the development of the printed matter exclusion was closely related to the doctrine excluding methods of doing business from patentable subject matter. See Chisum, *The Patentability of Algorithms*, 47 U. PITT. L. REV. 959, 965 (1986).

115. *In re Hansen*, 154 F.2d at 685.

116. *In re Gulack*, 703 F.2d 1381, 1383 (Fed. Cir. 1983).

117. 154 F.2d at 685.

118. Two commentators, after discussing *In re Gulack*, declared: "This holding could be characterized as an affirmation of the potential patentability of 'look and feel' presentations of data." White & Redano, *supra* note 110, at 20 (1987).

“purely mental steps” from patentable subject matter.<sup>119</sup> Some cases suggested that a patentable process must operate to transform and reduce matter to a different state or thing.<sup>120</sup> “It is self-evident that thought is not patentable.”<sup>121</sup>

When the issue of patents involving software arose in the 1960’s, the Patent Office refused to allow such applications, relying in part on the mental steps doctrine.<sup>122</sup> Software-implemented processes might fall into the doctrine’s scope of exclusion since a process taking place wholly within a software program would not necessarily operate to transform and reduce matter to a different state or thing.<sup>123</sup> One might analogize the steps executed in a computer program to a “thought process” that could be performed mentally by a human.

Look and feel-related processes, on the other hand, arguably transform audiovisual displays and reduce them to a different state; for example, the manipulation of phosphors by cathode rays to create video displays on a computer monitor could provide the necessary nexus to physical matter to make such processes patentable.<sup>124</sup> The process reflected in computer software look and feel cannot fairly be likened to a situation where a human could readily achieve the same result with pen and paper. A human might mentally follow the programming steps in software source code (with great difficulty), but the only practical value of following such steps in the case of computer software look and feel is to implement a user interface on a computer.

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119. 1 D. CHISUM, PATENTS, § 1.03[6] (1988); *Gottschalk v. Benson*, 409 U.S. 63, 67 (1972).

120. *See, e.g., Cochrane v. Deener*, 94 U.S. 780, 788 (1877). Professor Chisum maintains that this language in *Cochrane* was dictum, and when taken in context was intended as an inclusive description, not a preclusive description (*i.e.*, processes that operate in such a way are patentable, but are not the only processes that may be patented). *See Chisum, supra* note 114, at 967 n.30.

121. *In re Abrams*, 188 F.2d 165, 168 (C.C.P.A. 1951). In discussing this case, Professor Chisum cautions that “[o]ne must naturally be leery of a proposition which a court can justify only by reference to its self-evident truth.” *Chisum, supra* note 114, at 968 n.35.

122. *See Bender, Computer Programs: Should They be Patentable?*, 68 COLUM. L. REV. 241, 255-56 (1968).

123. For example, this objection was avoided in *Diamond v. Diehr*, 450 U.S. 175 (1980), where software and computers were used in conjunction with other steps and devices to cure rubber. A process manifest in the audiovisual displays of a computer software program, however, is not likely to reduce physical matter to a different state or thing. *But see infra* note 124, and accompanying text.

124. One might argue this example goes too far and would make such things as television shows patentable. Television shows as such, however, are not fairly called processes, and therefore do not come within the broad language of 35 U.S.C. § 101. On the other hand, a user interface implemented through audiovisual displays is fairly called a process.

It seems beyond questions that . . . computers . . . are in the technological field. . . . How can it be said that a process having no practical value other than enhancing the internal operations of those machines is not likewise in the technological or useful arts?<sup>125</sup>

While convincing arguments may be made that look and feel-related patents would not violate the traditional mental steps doctrine, such arguments may be unnecessary. The continued existence of the doctrine has been called into question,<sup>126</sup> and its viability is discussed below.

From 1969 to 1972, the Court of Customs and Patent Appeals dismantled the mental steps doctrine while reviewing software-related applications rejected by the Patent Office.<sup>127</sup> As stated in *In re Musgrave*:<sup>128</sup>

We cannot agree with the board that these claims (all the steps of which can be carried out by the disclosed apparatus) are directed to non-statutory processes merely because some or all the steps therein can also be carried out in or with the aid of the human mind or because it may be necessary for one performing the processes to think. All that is necessary, in our view, to make a sequence of operation steps a statutory "process" within 35 U.S.C. § 101 is that it be in the technological arts so as to be in consonance with the Constitutional purpose to promote the progress of "useful arts."<sup>129</sup>

The C.C.P.A. noted that the exclusion of "purely mental steps" from patentable subject matter might lead to a correct result if construed to encompass only those steps which are incapable of being performed by a machine; the fact that machine-implemented steps could also be performed by a human mentally did not make them "purely mental steps."<sup>130</sup>

Surprisingly, the Supreme Court's subsequent decision in *Gottschalk v. Benson*<sup>131</sup> made a fleeting reference to the unpatentability of "[p]henomena of nature, . . . mental processes, and abstract intellectual

125. *In re Benson*, 441 F.2d 682, 688 (C.C.P.A. 1971), *rev'd*, *Gottschalk v. Benson*, 409 U.S. 63 (1972).

126. See Chisum, *supra* note 114, at 967-92; von Spakovsky, von Spakovsky & Graffeo, *The Limited Patenting of Computer Programs: A Proposed Statutory Approach*, 16 CUMB. L. REV. 27, 31 (1985-1986).

127. See Chisum, *supra* note 114, at 969 (citing *In re Musgrave*, 431 F.2d 882 (C.C.P.A. 1970); *In re Mahony*, 421 F.2d 742 (C.C.P.A. 1970); *In re Bernhart*, 417 F.2d 1395 (C.C.P.A. 1969); *In re Prater*, 415 F.2d 1378 (C.C.P.A. 1968), *reh'g*, 415 F.2d 1393 (C.C.P.A. 1968)).

128. 431 F.2d 882 (C.C.P.A. 1970).

129. *In re Musgrave*, 431 F.2d at 893. The court in *Musgrave* noted that steps involving the exercise of subjective judgment without restriction might violate the definiteness of disclosure requirements in 35 U.S.C. § 112. *Id.*

130. *In re Musgrave*, 431 F.2d at 889-90.

131. 409 U.S. 63 (1972).

concepts. . . ."<sup>132</sup> Professor Chisum suggests that this "disturbingly terse" reference to the mental steps doctrine may have been inadvertent and not intended to discard developments in the C.C.P.A.<sup>133</sup> The reference is made without a discussion of, or even citation to, the lower court cases on the mental steps doctrine. "It is quite irregular for any court to accomplish so much by a short, ambiguous, dogmatic statement."<sup>134</sup>

The Supreme Court's decision in *Parker v. Flook* quoted the *Benson* language,<sup>135</sup> but identified it as the "established rule that a law of nature cannot be the subject of a patent."<sup>136</sup> Earlier in the *Flook* opinion, the Court referred to the argument that a patentable process must operate to change materials to a different state or thing,<sup>137</sup> however, the Court appears to disclaim this view without actually rejecting it. "As in *Benson* we assume that a valid process patent may issue even if it does not meet one of these qualifications of our earlier precedents."<sup>138</sup>

Two years later in *Diamond v. Diehr*,<sup>139</sup> the Supreme Court stated: "Excluded from such patent protection are laws of nature, natural phenomena, and abstract ideas."<sup>140</sup> The Court cited *Flook* and *Benson*, and yet omitted reference to "mental processes." The *Diehr* Court then stated that *Flook* and *Benson* stood for no more than the long-established rule that "principles" were not patentable processes.

"[A] new mineral discovered in the earth or a new plant found in the wild is not patentable subject matter. Likewise, Einstein could not patent his celebrated law that  $E=mc^2$ ; nor could Newton have patented the law of gravity."<sup>141</sup>

This suggests that the use of the term "mental processes" in *Benson*, and as quoted by *Flook*, was never intended to refer to the mental steps doctrine.<sup>142</sup> It would appear that, for all intents and purposes, the mental steps doctrine has not been squarely before the Supreme Court

132. *Gottschalk v. Benson*, 409 U.S. at 67 (emphasis added).

133. Chisum, *supra* note 114, at 981.

134. *Id.*

135. See *supra* note 132, and accompanying text.

136. *Parker v. Flook*, 437 U.S. 584, 589 (1978).

137. *Id.* at 588 n.9 (citing *Cochrane v. Deener*, 94 U.S. 780, 787-88 (1876)).

138. *Id.*

139. 450 U.S. 175 (1981).

140. *Diamond v. Diehr*, 450 U.S. at 185.

141. *Diamond v. Diehr*, 450 U.S. at 185 (quoting *Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980) (quoting *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 130 (1948))).

142. Professor Chisum notes that "a process consisting partially or wholly of 'mental steps' does not exist in nature and can be quite specific"; consequently there was no basis for the Court in *Benson* to lump mental steps with phenomena of nature or abstract concepts. See Chisum, *supra* note 114, at 981.

since the doctrine was repudiated by the C.C.P.A. in the late 1960's and early 1970's.

Lower court decisions, both before and after *Diehr*, have upheld the patentability of computer programs that do not appear to change materials to a different state or thing.<sup>143</sup> Thus, the current state of the law appears to be that as stated in *Musgrave*, i.e., a process is not made unpatentable simply because some or all of the machine-implemented steps could also be performed by a human mentally.<sup>144</sup>

Consequently, the mental steps doctrine should not survive to exclude look and feel-related processes from statutory subject matter. Alternatively, if the doctrine does survive, the Court should hold that look and feel-related processes have a sufficient nexus to the transformation of matter and the technological arts to avoid the exclusive effect of the mental steps doctrine.

In conclusion, it appears that computer-implemented processes involving audiovisual look and feel are within the statutory scope of patentable subject matter and are not categorically excluded by the judicial doctrines relating to mathematical algorithms, printed matter, or mental steps. These inventions, if they meet the further requirements of the Patent Act such as novelty,<sup>145</sup> nonobviousness,<sup>146</sup> and disclosure,<sup>147</sup> are the proper subjects of valid patents.

## B. Design Patents

The first design patent law was enacted in 1842 and defined subject matter as "any new and original design for a manufacture, whether of metal or other material or materials" or any of a list of items, such as for the printing of fabrics, design for a statue, any ornament to be placed on an article of manufacture, etc.<sup>148</sup> In 1902 it was amended to define

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143. See *In re Pardo*, 684 F.2d 912 (C.C.P.A. 1982) (a means of allowing a computer to process commands in any order received, rather than sequentially); *In re Taner*, 681 F.2d 787 (C.C.P.A. 1982) (a seismic prospecting method); *In re Toma*, 575 F.2d 872 (C.C.P.A. 1978) (a means of translating between natural languages, e.g., from Russian to English); *In re Freeman*, 573 F.2d 1237 (C.C.P.A. 1978) (a process of typesetting using concatenation points to position characters); *In re Chatfield*, 545 F.2d 152 (C.C.P.A. 1976), cert. denied, 434 U.S. 875 (1977) (a time sharing method for operating computer programs simultaneously); *Paine Webber, Jackson & Curtis, Inc. v. Merrill Lynch, Pierce, Fenner & Smith, Inc.*, 564 F. Supp. 1358 (D. Del. 1983) (a methodology to effectuate a highly efficient business system).

144. *In re Musgrave*, 431 F.2d 882, 889-90 (1970). See also *supra* note 129, and accompanying text.

145. 35 U.S.C. § 102 (1982).

146. 35 U.S.C. § 103 (1982 & Supp. V 1987).

147. 35 U.S.C. § 112 (1982).

148. Act of August 29, 1842, ch. 263, § 3, 5 Stat. 543, 544.

subject matter as "any new, original, and ornamental design for an article of manufacture" and eliminating the enumerated items.<sup>149</sup> The courts have added a further requirement to the statutory language: designs that are primarily functional or dictated by functional considerations are not proper subject matter for design patents.<sup>150</sup>

The Patent Office granted the first design patents for computer displays on May 10, 1988 to Xerox Corporation.<sup>151</sup> United States Design Patent No. 296,339, dated June 21, 1988, states as its claim the "ornamental design for an icon for freehand drawing softkey display or the like, as shown and described." This demonstrated that the Patent and Trademark Office believed design patentability tests, including subject matter, had been met.<sup>152</sup> One commentator proclaimed that "Xerox has discovered a new form of protection for the 'look and feel' of software."<sup>153</sup>

This novel development warrants further analysis; the scope and requirements of design patent protection are discussed further in the following sections.

### 1. ARTICLE OF MANUFACTURE

The term "article of manufacture" has been construed broadly. In the case of a design patent claim for a water fountain with rotating sprays, the court held "a manufacture is anything made 'by the hands of man' from raw materials, whether literally by hand or by machinery or by art. Certainly the fountains are so made."<sup>154</sup> Computer monitors are made this way as well, and consequently their ornamentation (including audiovisual displays appearing on the monitor) is likely to be included within a broad construction of the term "article of manufacture."

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149. See 35 U.S.C. § 171 (1982).

150. See *Powers Control Corp. v. Hybrinetics, Inc.*, 806 F.2d 234 (D.C. Cir. 1986); see also 1 D. CHISUM, PATENTS § 1.04[2][d] (1988).

151. Kluth & Lundberg, *Design Patents: A New Form of Intellectual Property Protection for Computer Software*, 5 COMPUTER LAWYER 1 (Aug. 1988).

152. It appears that the Patent and Trademark Office has since reversed its opinion, and currently maintains that computer software video displays are not within the statutory subject matter of design patents. Statement of Gerard Goldberg, Group Director, Group 230, U.S. Patent and Trademark Office, at Prentice-Hall Conference on Patent Protection for Computer Software: The New Safeguard, in San Francisco, Cal. (September 25, 1989).

153. See Kluth & Lundberg, *supra* note 151, at 1.

154. *In re Hruby*, 373 F.2d 997, 1000 (C.C.P.A. 1967).

## 2. NONFUNCTIONAL ORNAMENTAL DESIGN

"Ornamental implies that the design must be the product of aesthetic skill and artistic conception."<sup>155</sup> However, a design that is "primarily functional" or "dictated by functional considerations" is not proper subject matter for design patents.<sup>156</sup> There are two reasons for this rule of functionality. First, where function dictates configuration, there is no ornamental creativity.<sup>157</sup> "It was certainly not the intent of the law to grant monopoly to purely conventional design which is in itself little more than a necessary response to the purpose of the article designed."<sup>158</sup> Further, design patent protection for functional features would in effect grant a utility patent, while circumventing Section 101 subject matter requirements.<sup>159</sup>

Computer software look and feel is often the product of aesthetic skill and artistic conception,<sup>160</sup> in most cases "aesthetic quality is critical."<sup>161</sup> The question is whether look and feel is "primarily functional"

155. See Kluth & Lundberg, *supra* note 151, at 3.

156. Powers Control Corp. v. Hybrinetics, Inc., 806 F.2d 234 (D.C. Cir. 1986).

157. D. CHISUM, *supra* note 150.

158. Applied Arts Corp. v. Grand Rapids Metalcraft Corp., 67 F.2d 428, 430 (6th Cir. 1933) (invalidating a design patent covering a combination ash receiver and electric lighter for use in automobiles).

159. D. CHISUM, *supra* note 150.

It is unclear whether this concern for protecting the scope of utility patent protection extends to the Copyright Act or the Lanham Act.

A strong argument may be made that the statutory scope of protectable subject matter is mutually exclusive in the case of utility patents and copyrights. The Constitution expressly distinguishes between science, authors, and writings on the one hand, and useful arts, inventors, and discoveries on the other. See U.S. CONST. art. I, § 8, cl. 8. Further, the codification of the idea/expression dichotomy expressly excludes from copyright protection any "process" or "discovery," mirroring the Patent Act and its constitutional grant of power. See 17 U.S.C. §102(b) (1988).

Nonetheless, courts have often held that patent, copyright, and trademark laws stem from different concepts, offer different kinds of protection, and are not mutually exclusive. See *In re Penthouse Int'l*, 565 F.2d 679, 683, n.3 (C.C.P.A. 1977). See also 1 J. MCCARTHY, (TRADEMARKS AND UNFAIR COMPETITION § 6:1 (2d ed. 1984).

The Lanham Act, on the other hand, was enacted under a broader authority: the Commerce Clause. See Trade-Mark Cases, 100 U.S. 82, 91 (1879). Decisions regarding trademark law's doctrine of functionality do not reflect a deference to the Patent Act; rather they are concerned with the effect of protection on competition. See *supra* Section II.C. Consequently, a process which was also a product feature could conceivably qualify for both trade dress and utility patent protection.

160. See, e.g., Broderbund Software, Inc. v. Unison World, Inc., 648 F. Supp 1127, 1134 (N.D. Cal. 1986) ("The . . . designer of any program that performed the same functions as 'Print Shop' had available a wide range of expression governed predominantly by artistic . . . considerations"); see also *infra* Appendix, Figures 1-7 (illustrations of "Print Shop").

161. Presentation by Cathy Hemingway, Ph.D., at the West Coast Computer Fair, in San Francisco, Cal. (March 17, 1989) (Dr. Hemingway is Vice President of Sobell Associates and a user interface consultant to Sun Microsystems).

or "dictated by functional considerations." Here again we encounter what is a test of metaphysics.<sup>162</sup> Fortunately, the rationale for the distinction here appears to be the same as that in the case of trade dress and copyright law: the scope of legal protection must be balanced against society's interest in competitive markets.<sup>163</sup> Further, design patent law may not be used as a means of attaining what amounts to a utility patent.<sup>164</sup>

### 3. REFOCUSING THE FUNCTIONAL/NONFUNCTIONAL ANALYSIS

This comment proposes that courts applying design patent law adopt a concept of *de jure* functionality.<sup>165</sup> The ornamental design of an article of manufacture is *de jure* functional if protection would unduly hinder competition, without regard to the *de facto* functional or *de facto* nonfunctional nature of the design. Additionally, the subject matter of utility patents is *de jure* functional, and not the proper subject matter of design patents. However, if protection for an ornamental design is not an attempted "end run" around utility patent protection, and further would not result in the undue hindrance of competition, then such protection should be upheld as valid.

Whether the scope of protection in Xerox's design patents extends to the look and feel of the audiovisual displays remains uncertain. In fact, it was the Xerox Star interface that was the inspiration for the Macintosh interface.<sup>166</sup> The recently patented screens by Xerox may bear a familial relationship to the Macintosh interface and virtually all graphics-based user interfaces available. If that familial similarity suggests that design patents could be used by Xerox to secure judgments or injunctions against virtually all major software developers (and thereby bestow market monopoly power on Xerox), then the patents should be

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162. Compare the requirement here of "nonfunctional" to that of trademark law ("nonfunctional"), see *supra* Section II.C., and that of copyright law ("expression, not idea"), see *supra* Section III.A.

163. See *supra* notes 49 and 85, and accompanying text.

164. Although design patents are subject to the additional tests of novelty, nonobviousness, etc., these tests are applied to the subject matter of the design patent (the ornamentation). Where, as a practical matter, protection of ornamentation also results in protection of subject matter within the scope of utility patents, a utility patent-in-effect is obtained, while only the ornamentation, not the machine or process, has been evaluated for novelty, nonobviousness, and so on.

165. For the source of this distinction, see the discussion of the doctrine of functionality in trademark law, see *supra* Section II.C., and accompanying text. For a similar proposal made by this comment in the context of copyright's idea/expression analysis, see *supra* Section III.B.

166. See Parker & Flynn, *Apple/Microsoft Suit Ruling Fails to Clear Contract Issue*, *InfoWorld*, Mar. 27, 1989, at 93, col. 5.

adjudicated invalid. On the other hand, if granting protection to Xerox would protect their interest without unduly burdening competition, then the ornamental features of the patented displays should be *de jure* non-functional, and validly protected.<sup>167</sup>

Further, if Xerox's audiovisual displays embody a look and feel that is within the scope of utility patent subject matter,<sup>168</sup> and protection for that aspect of the user interface is not disclaimed in the design patent they received, then the patent should be adjudicated invalid with respect to those aspects.

## CONCLUSION

The myriad ways in which computer programs manifest themselves make them unamenable to *per se* rules of protection or exclusion from federal sources of intellectual property protection. Consequently, courts are forced to distinguish between various manifestations in a program, often applying rules that on their face require a metaphysical separation of what otherwise seems inseparable. This approach frequently leaves courts, counsel, and clients without reasoned principles to guide their actions.

A better approach is to abandon metaphysics and analyze each case in light of the rationale for the rule. If, in the case of trade dress, the rationale of limiting protection to nonfunctional features is to protect our interest in producer identification without unduly hindering competition, then we may safely protect trade dress *as long as* competition has not been unduly hindered.

The rationale for distinguishing idea from copyrightable expression is to promote writings by rewarding authors, without unduly hindering competition for such works. Consequently, we may safely reward the author by protecting an aspect of her work *as long as* competition in the market for such works is not unduly hindered.

Finally, the rationale applies to design patents, with further deference to the scope of utility patent protection, and the same result should follow. We may safely protect the ornamental design of an article of manufacture *as long as* protection would not unduly hinder competition and would not result in protection for the subject matter of utility patents without meeting the requisite tests.

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167. User interfaces that predate the subject of Xerox's design patents would normally have no reason to fear the patents' validity. Such interfaces would be part of the prior art, and Xerox's work must be sufficiently novel and nonobvious in light of such prior art.

168. See the discussion on this issue *supra*, Section IV.A.

This approach is more administrable for the courts, focusing on more familiar tenets of competitive analysis rather than the metaphysics of new technologies. This approach is wholly consistent with the purpose of the statutory and judicial rules; it cuts to the very rationale of the rules and provides the necessary gloss to statutory language. Further, the results are consistent with the constitutional grant of authority under which the federal statutes are enacted.

**APPENDIX:****An Illustrated Guide to Computer Software Audiovisual  
Look and Feel**

This appendix reproduces screen displays from several computer software programs. In some cases, sequences of screens are presented as they would appear to the user in performing some task. These figures and accompanying text are simply examples, and in no way approach the total depth and complexity of the programs' look and feel. The examples are useful, however, in demonstrating the visual appearance of screens and certain dynamic aspects of the displays.

The following products are included in this appendix (identified by product name, publisher, and supported computer):

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Product 1: The Print Shop<sup>169</sup>

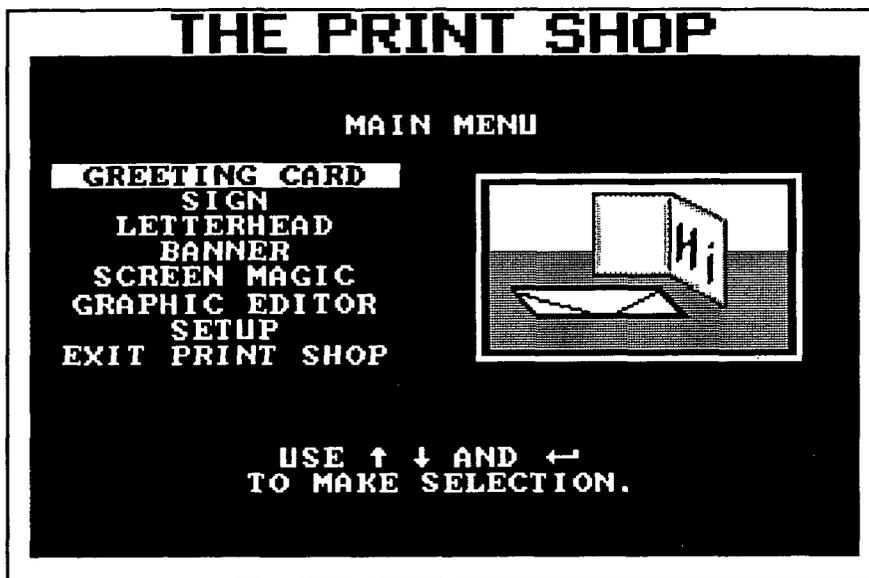


Figure 1

Figure 1 shows the main menu of Broderbund Software's Print Shop product as it appears on the IBM PC. Using directional arrow keys, the user can make a selection by highlighting an item (e.g., "Greeting Card" is highlighted above) and pressing the return key. As the user highlights different selections, the illustration on the right side of the screen is updated to match the current selection. For example, if the user pressed the down arrow key, "Sign" would be highlighted and the illustration to the right would change from a greeting card to a sign.

The following sequence of screens<sup>170</sup> represents only one branch in a tree of different possible steps in using the program. The sequence will represent some of the steps and available choices in creating a computer-generated greeting card with The Print Shop.

169. The Print Shop was the plaintiff's product in *Broderbund Software, Inc. v. Unison World*, 648 F. Supp. 1127 (N.D. Cal. 1986). The version of The Print Shop for Apple II model computers (not to be confused with the Apple Macintosh) was the copyrighted program held infringed by Unison World's "Printmaster"; the screens shown here are from the IBM version of The Print Shop, but nonetheless are virtually identical to the Apple II version screens.

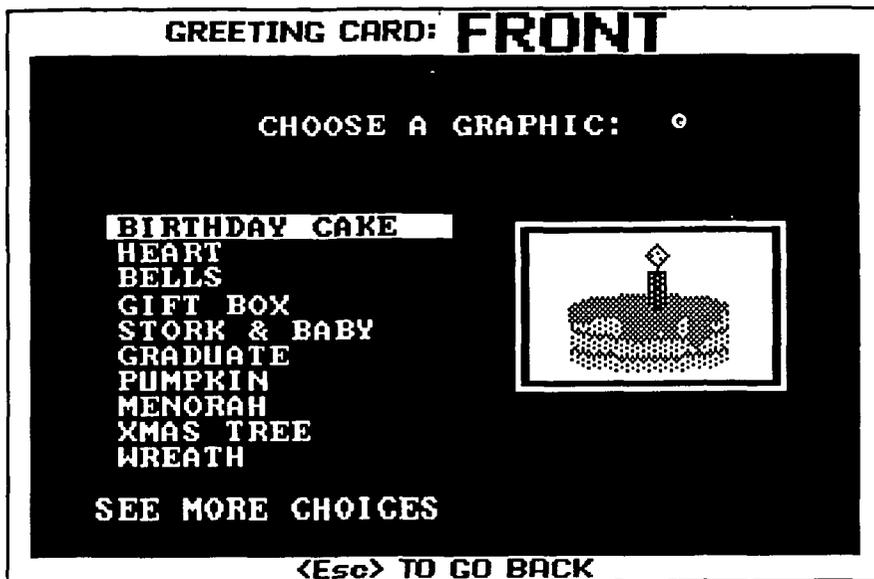
170. Certain screens in this sequence have been omitted.



**Figure 2**

In Figure 1, the user selected "Greeting Card." The screen illustrated in Figure 2 invites the user to select a border for the front of the greeting card. The same method of highlighting an item and pressing return is used to make the selection (in this case, the border "notes"). As different selections are highlighted, a picture of the highlighted border is displayed.

Is the display of a graphic image that correlates to the user's current selection functional or nonfunctional? Is it an idea or the expression of one? Compare the use of illustrations here with illustrations presented in the main menu, *supra*, Figure 1 (a decorative display accompanying otherwise self-explanatory commands such as "Greeting Card"). The illustrations of available borders in Figure 2 provide a *de facto* functional purpose: they allow the user to view a border before selecting it, rather than choosing from just a text description. The illustrations on the main menu in Figure 1 do not seem to serve such a purpose. Illustrations there seem more decorative than *de facto* functional.



**Figure 3**

In Figure 3, the user selects a graphic to be used on the front of the greeting card. As the user highlights different selections, the right half of the screen automatically displays a graphic image of the selection (in this case, a birthday cake).



**Figure 4**

After selecting a graphic for the greeting card front, the user selects where the graphic should appear in Figure 4. In this case the user is selecting a staggered layout, where the image will appear at each location shown in the image to the right.



**Figure 5**

Figure 5 displays the user's choices as to a type style for text to appear on the greeting card. As the user highlights different font names, the corresponding type style is displayed at the bottom of the screen.



**Figure 6**

The user then types in the text they would like to have appear on the front of the greeting card. (At this point in the program and not shown in this appendix, the sequence shown in Figures 1 through 6 is repeated for the inside cover of the greeting card.)



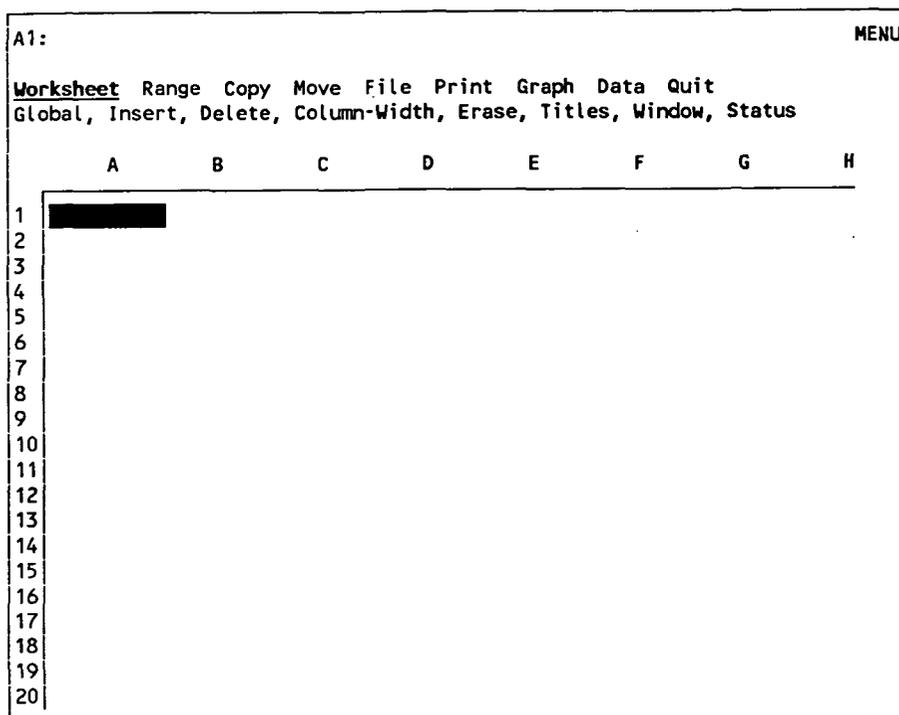
**Figure 7**

Once the process is complete, the user has a number of options which include adding a "by" line to the back of the greeting card (by selecting "Give Yourself Credit" as highlighted above), and printing the greeting card on an attached printer.



change the speed from its current value above, 1200, to 2400, the user would enter "sp 2400". The status screen would then show 2400 in place of 1200, and the program would instruct the modem to communicate at that rate.

### Product 3: Lotus 1-2-3<sup>172</sup>



**Figure 9**

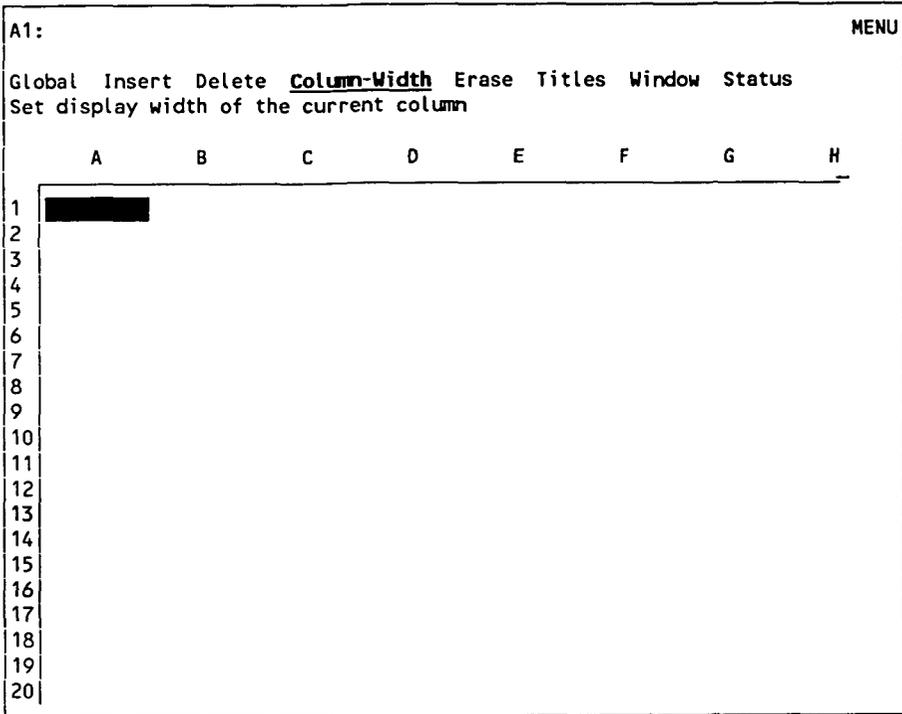
Lotus 1-2-3 is a spreadsheet product for the IBM PC used mainly for business and financial applications, and it is illustrated in Figure 9. Numbers are arranged in columns (A, B, C, etc.) and rows (1, 2, 3, etc.). Certain commands may be used to perform mathematical operations on all or parts of columns, rows, or ranges of columns and rows.

<sup>172</sup>. By Lotus Development Corporation. This product is the subject of current look and feel litigation in the federal district court for Massachusetts. *See* Lotus Dev. Corp. v. Mosaic Software Inc., No. N87-0074-K (D. Mass. filed Jan. 12, 1987); Lotus Dev. Corp. v. Paperback Software Int'l, Inc., No. N8-0076-K (D. Mass. filed Jan. 12, 1987).

Directional arrow keys on the keyboard are used to position a highlighted cursor anywhere in the spreadsheet matrix. At the very top left corner of the screen is an indicator of the cursor's position (currently at A1, or column A, row 1). Below the indicator is a row of commands. If the user presses the "/" key on the keyboard, the menu will be activated. "Worksheet" will be highlighted when the menu becomes active, and the user may use the directional keys to select another command on the row. As different commands are highlighted, the row of text below the commands changes to describe further choices or features the particular command offers.<sup>173</sup> For example, selecting "Worksheet" will allow the user to access the "Column-Width" command. The following screens show the structure, sequence and organization of displays that appear when a user performs the simple task of changing the width of a column.

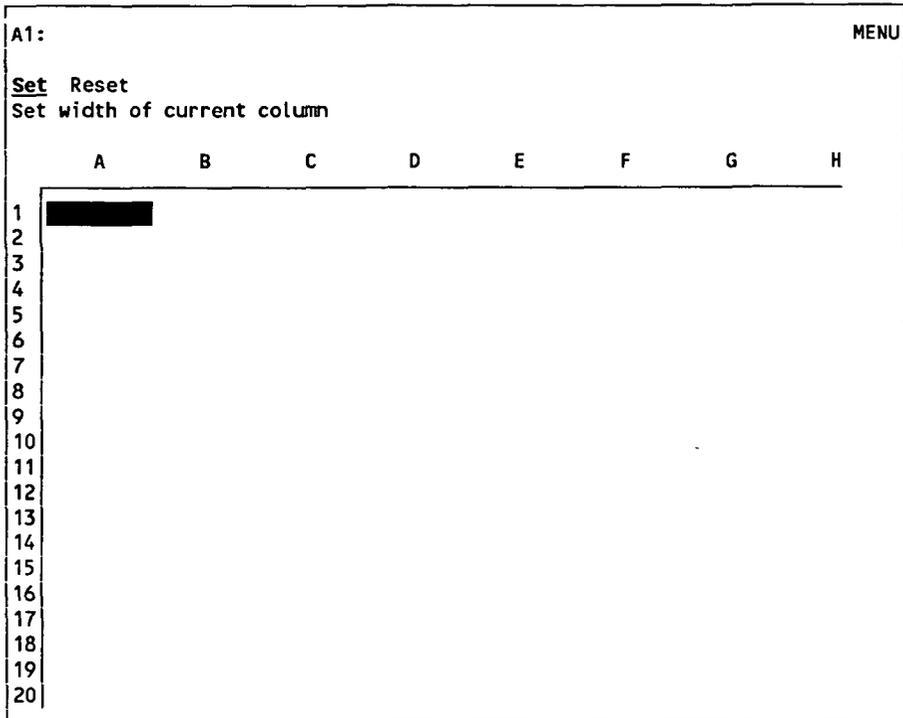
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173. Compare this dynamic updating technique (displaying information about a command when it is highlighted) to the similar phenomenon in the Print Shop, *supra* Figures 1 and 2.



**Figure 10**

After selecting "Worksheet," a submenu appears as shown in Figure 10, replacing the main menu. With the directional arrow keys, the user can highlight "Column-Width" and see a description of the command. If the user wishes to execute the command, she presses the return key.



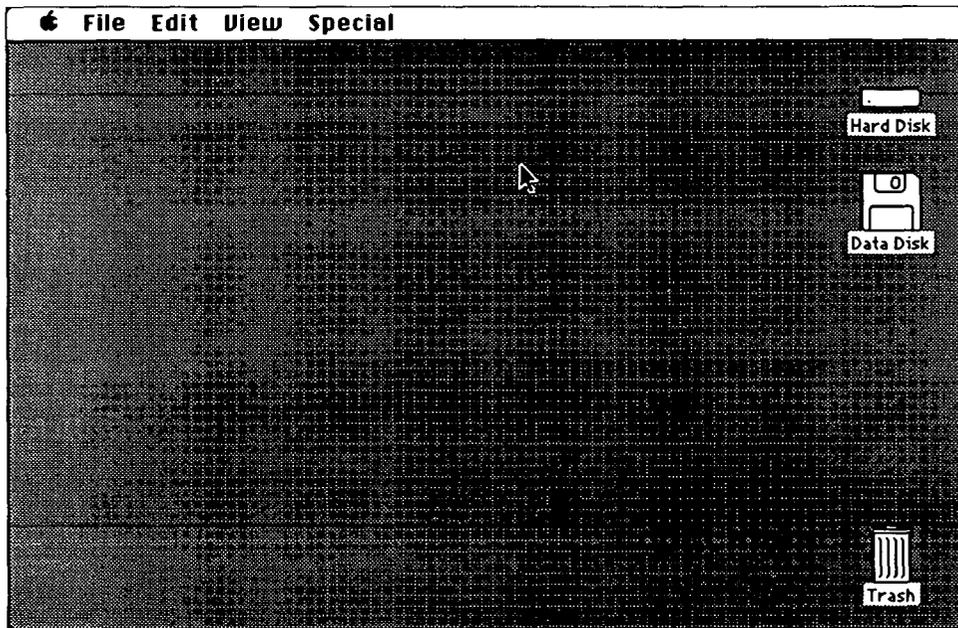
**Figure 11**

After selecting the Column-Width command, the screen in Figure 11 appears. Selecting Set will allow the user to specify a width for the column. Selecting Reset will return a previously resized column to the standard size.

A1:						POINT
Enter column width (1..72):20						
	A	B	C	D	E	F
1	██████████					
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

**Figure 12**

At this point (after selecting the Set command), the user enters a numeric value for the width (in characters) of the column, or uses the directional arrow keys to expand or contract the column width. (In the upper right corner, the word MENU in prior screens has changed to POINT; this indicates to the user that she may use either the arrow keys to "point" to a desired column-width, or type in a numeric value.) Once set, the user presses return. Then the lower spreadsheet area becomes active again and the menu area is deactivated.

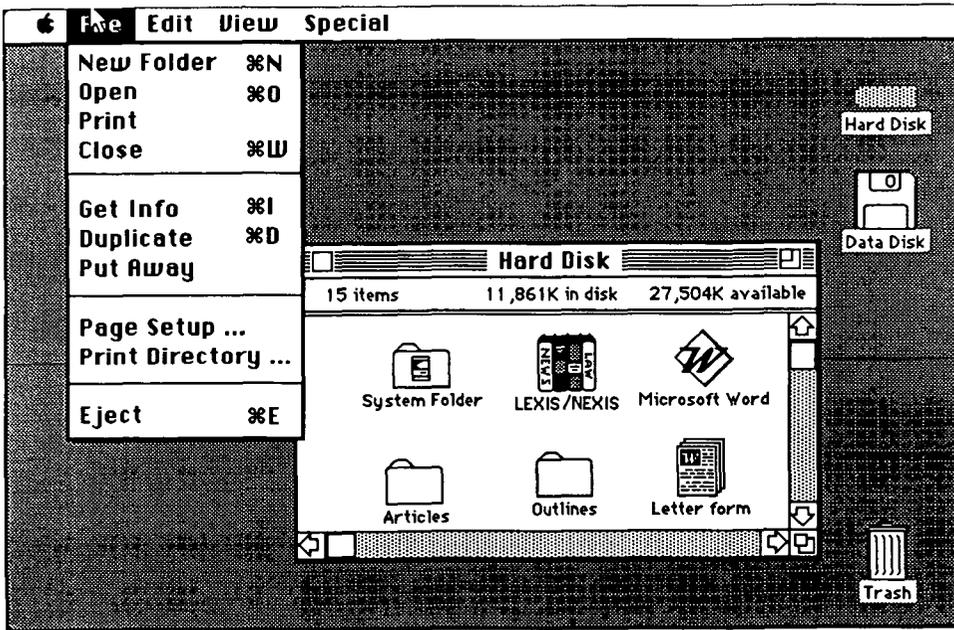
**Product 4: Apple Macintosh Finder<sup>174</sup>****Figure 13**

Apple Computer publishes Finder (and MultiFinder) for its Macintosh line of computers. Finder is the Macintosh operating system.<sup>175</sup> When a Macintosh user starts her computer, she may see something like Figure 13. In the center of the screen is an arrow, or cursor, which moves in response to movements of a device called a "mouse." When the user moves the hand-held mouse in any compass direction, the cursor will move accordingly. The cursor is used in conjunction with four main elements of the interface: pull-down menus, icons, windows and dialog boxes.

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174. The Macintosh "Finder" is the plaintiff's product in litigation pending in the federal district court for the Northern District of California. *See Apple Computer, Inc. v. Microsoft Corp. and Hewlett Packard*, No. C-88-20149-RPA (N.D. Cal. March 20, 1989).

175. Operating system software controls the interaction of the various components of the computer system, such as the central processing unit, memory devices, and other software programs.



**Figure 14**

**A. PULL-DOWN MENUS**

At the top of the screen appears the "menu bar." If the user moves the cursor over one of the commands on the menu bar and presses the mouse button, a submenu can be "pulled down," and a submenu item selected. The commands available here (as in most operating systems) relate to starting programs, copying files, deleting files, and so on.

**B. ICONS**

To the right appear "disk icons." (Icons are also used to represent files and certain functions, as discussed below.) A disk is a form of magnetic media, similar in function to a cassette tape, used to store software programs and data in "files." As the user removes and adds disks, the screen updates to display the appropriate disk icon and disk name.

Below the disk icons appears the celebrated "trash can" icon, used for deleting unwanted information. By pointing to a file icon, the user can "drag" it over to the trash can and throw it away.

### C. WINDOWS

Figure 14 shows the use of a "window" to display the contents of a disk, in this case the computer's hard disk (a hard disk is a mass storage device which can hold many times the amount of information stored on a floppy disk). When the user selects a disk for viewing, a very brief animation sequence appears in which the window "explodes" from the disk.

Files normally appear as icons (although the viewer may select other viewing options). Certain icons, such as "LEXIS/NEXIS" and "Microsoft Word" are software programs. Below the LEXIS/NEXIS icon appears a file folder given the name "Outlines," which may contain a number of additional program or data files. Below the Microsoft Word icon appears the data file "Letter Form."

On the right and bottom borders of the window appear "scroll bars." These can be used to view areas of the disk that are not currently displayed within the confines of the window.<sup>176</sup> For example, by moving the small box that appears in the vertical scroll bar, the display of the disk contents moves up or down. Alternatively, the user could resize the window to any sort of rectangle using the small icon at the very lower right corner of the window.

The window could be repositioned elsewhere on the screen by pointing to the very top bar of the window (the title bar) and "dragging" the window to a new location. The simple square icon in the upper left corner of the window is used to close the window, *i.e.*, it "implodes" in an animation sequence back into the disk icon. A similar icon to the far right is used to return a window to its original size and location after it has been changed.

### D. DIALOG BOXES

Figure 15, *infra*, displays a dialog box. Usually dialog boxes appear after the user has selected a command that requires some additional information before it can be executed. The mouse is used to select certain options and provide the necessary information; there is a "dialog" between the software and the user as to what exactly should be done.

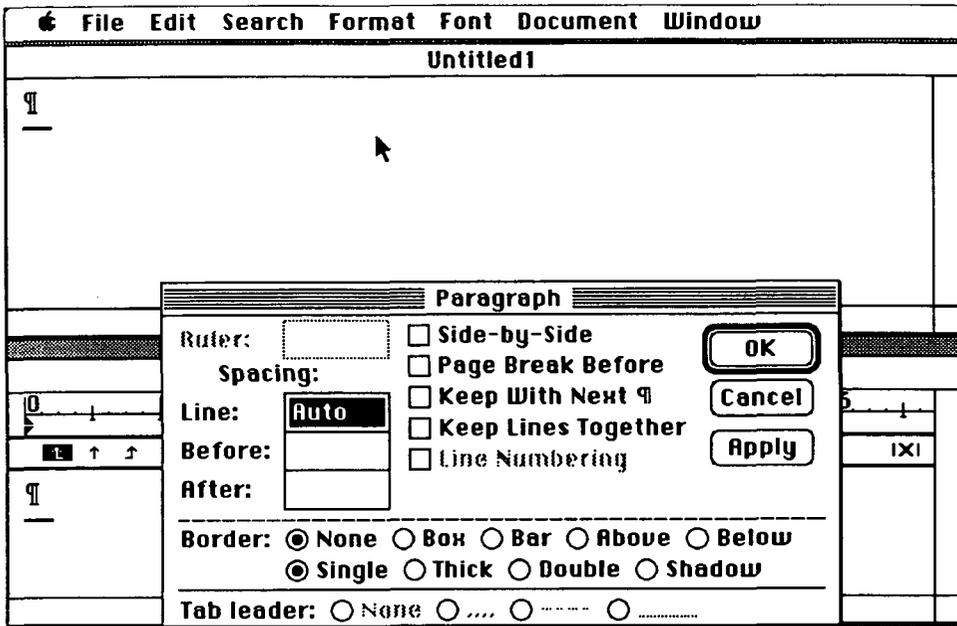
Virtually all software for the Apple Macintosh, whether developed by Apple Computer or third party developers, conforms to user interface guidelines promulgated by Apple Computer. The following figures present examples of how those standards are manifest in common

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176. Note that 6 file or folder icons appear in the window, but the upper left corner of the window states that there are "15 items" altogether stored on the disk.

application programs; the examples include one product by Apple Computer, and two products by a third party developer, Microsoft.

### Product 5: Microsoft Word<sup>177</sup>



**Figure 15**

Figure 15 displays a working screen from Microsoft Word for the Apple Macintosh. The image titled "Paragraph" is not a window but a dialog box. In this case, the user selected a command from a pull down menu to change certain attributes of text paragraphs. The dialog box allows the user to select certain options and set certain controls.

Behind the dialog box appear two data windows. The user may type in text in either document, copy from one to another, and save them separately as files. When the dialog box is gone, one of the windows will become active again, and the scroll bars seen in Figure 14 will reappear.

177. Microsoft Word for the Macintosh computers is not the subject of litigation between Apple Computer and Microsoft; the litigation relates to Microsoft Windows, a product for IBM microcomputers, and similar in function to the Macintosh Finder. See *Apple Computer, Inc. v. Microsoft Corp. and Hewlett Packard*, No. C-88-20149-RPA (N.D. Cal.)

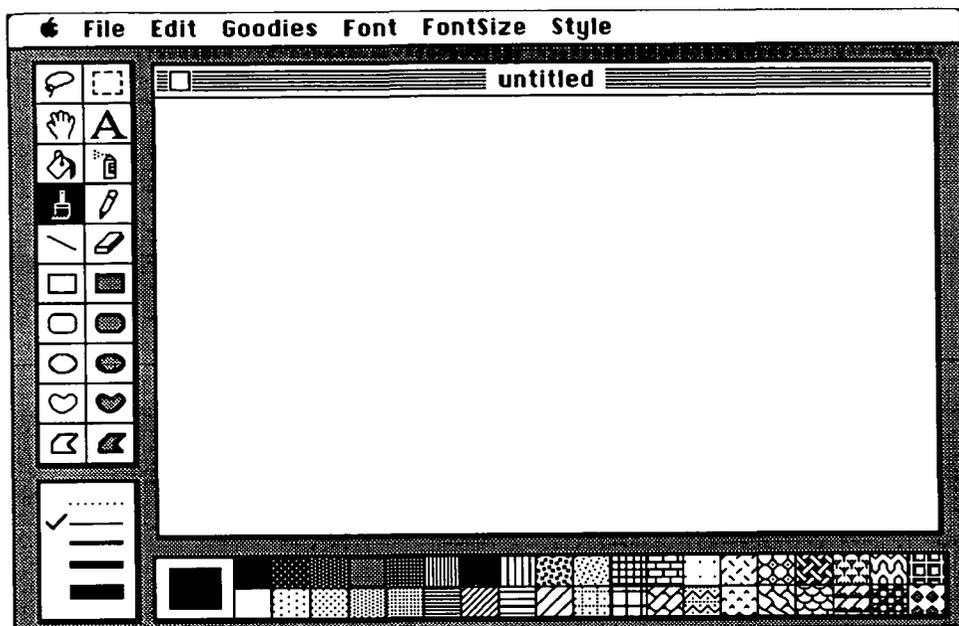
**Product 6: MacPaint<sup>178</sup>****Figure 16**

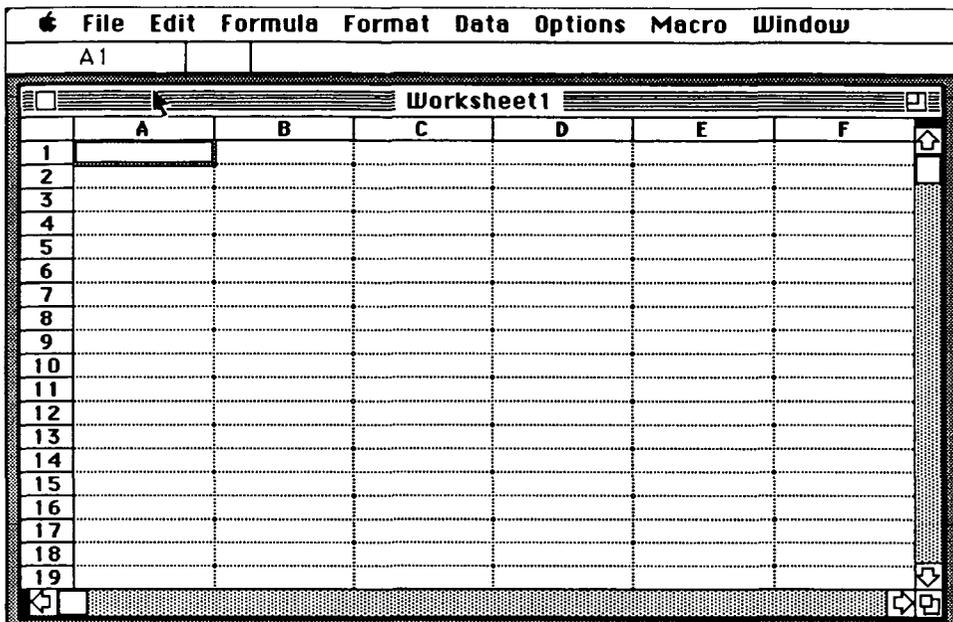
Figure 16 is a screen from MacPaint. A "paint" product allows the user to create pictures on screen, and then save them to disk, print them, or even incorporate them into the text of a document. On the left side of the screen appear "tool icons." The tool icons represent various drawing features. For example, above the currently selected paintbrush is a spilling can of paint; this feature is used to fill an enclosed area completely. The hand icon is used to move the drawing and access areas not displayed within the window (as an alternative to using a window with scroll bars).

At the lower left corner, the user can select various line thicknesses to draw with, and to the right appears a palette of patterns with which to draw.

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178. MacPaint was originally developed and marketed by Apple Computer. Apple has since created a subsidiary, Claris, to continue marketing and development efforts for Apple software.

## Product 7: Microsoft Excel



**Figure 17**

Figure 17 displays a screen from the Macintosh version of Microsoft Excel, a spreadsheet program similar in function to Lotus 1-2-3. Below the pull-down menu bar is an area for showing the active cell in the spreadsheet, in this case "A1" (column A, row 1). A conventional window is used to display the spreadsheet, and scroll bars may be used to view areas of the spreadsheet that are off-screen.<sup>179</sup>

179. Compare the "look" of Microsoft Excel with Lotus 1-2-3, *supra* Figures 8-12.

