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Article

Cybermarks

Dan L. Burk[†]

INTRODUCTION

Trademark disputes have been a fixture of Internet law since the first days of commercial traffic on the network. These disputes have persisted across a variety of technological and legal changes, and as previous commentators have correctly noted, have significantly distorted the policy and doctrine of trademark law in general. In the next few pages I propose to examine why Internet trademarks, which I have called “cybermarks,” are so persistent, why cybermarks are different, and how recognition of that difference might lead us to approach disputes over their use more productively.

I use the portmanteau term “cybermark” advisedly, well aware of the popular tendency to indiscriminately attach the *cyber*-prefix to any item associated with the Internet or information technology, to produce catchy but largely meaningless buzzwords.¹ But the prefix hails originally from the discipline of cybernetics,² denoting the governance or regulation of systems, particularly the control of information systems,³ and ultimately from a Greek root indicating steering or control.⁴ And that is precisely the right term for the marks I propose to examine. It is not so much the correct term because of their use

[†] Chancellor's Professor of Law, University of California at Irvine. Copyright © 2010 by Dan L. Burk.

1. Indeed, the science fiction author William Gibson, who first coined the term “cyberspace” for his dystopian stories of the future, has commented that he used it as a catchy buzzword, not because it had any particular semantic content. NO MAPS FOR THESE TERRITORIES: A DOCUMENTARY BY MARK NEALE (Docurama 2000).

2. See NORBERT WIENER, CYBERNETICS OR CONTROL AND COMMUNICATION IN THE ANIMAL AND THE MACHINE 19 (1948).

3. Gordon Pask, *Cybernetics*, in ENCYCLOPEDIA BRITANNICA 936, 936–37 (1972).

4. See WIENER, *supra* note 2, at 19.

on the Internet, figuratively in "cyberspace." Rather, cybermarks are components of a data processing system, intended to initiate and control discrete functions of a machine. Unlike trademarks in traditional media, cybermarks are marks that "behave."⁵ Although they may in other contexts serve the source-identifying function of trademarks, cybermarks are no longer primarily expressive; they are functional in the most mechanical sense of the term; they have become a form of computer code.

In discussing the character of cybermarks, I draw on parallel disputes regarding functional subject matter in patent and copyright law. I begin by briefly tracing the history of Internet trademark disputes over the past fifteen years. I then discuss the functional nature of cybermarks and their relationship to other functional subject matter in intellectual property. I suggest that trademark law's functionality doctrine is appropriately suited to resolving cybermark disputes, and conclude by addressing some possible objections to using functionality doctrine to resolve cybermark disputes.

I. TRADEMARKS ON THE INFOBAHN

Internet trademark disputes appeared almost immediately after public access to the network became available, in the mid-1990s, even before other intellectual property disputes appeared.⁶ Trademark disputes have been a consistent feature of the Internet's legal landscape since then, appearing in connection with a range of successive technologies including domain names, search engines, and keyword advertising.⁷ Although these technologies appear to involve very different factual settings, they share certain common features that have animated trademark disputes. Tracing the trajectory of trademark issues in these different settings sets the stage for understanding the nature of cybermarks.

A. DOMAIN NAME DISPUTES

The earliest Internet trademark disputes were centered around domain names, the mnemonic labels that assist in iden-

5. See Pamela Samuelson et al., *A Manifesto Concerning the Legal Protection of Computer Programs*, 94 COLUM. L. REV. 2308, 2320 (1994).

6. See Dan L. Burk, *Trademark Doctrines for Global Electronic Commerce*, 49 S.C. L. REV. 695, 696 (1998).

7. See *infra* Parts II.A-C.

tifying the locations of resources on the Internet.⁸ Some of these mnemonic labels are cognates to well-known word marks; in many cases, so-called cybersquatters were able to register and use such cognate domain names before the holder of the trademark was able to do so.⁹ In some cases, this led to extortionate demands for payment in exchange for surrender of the domain name registration to the trademark holder.¹⁰ In other cases, the domain name holder had as logical a claim to the domain name as the trademark holder.¹¹

In early commentary on the problem of domain names, I suggested that such identifiers were frequently filling the role of addresses rather than the role of names.¹² Names are identifiers attached to discrete objects; addresses identify physical or logical locations where objects can be found.¹³ Trademarks must be the former; trademarks are names and not addresses; they identify a good or service, not the location of a good or service.¹⁴ It is certainly not unknown for a physical or logical address to gain the status of a trademark by acquiring secondary meaning, but only when the address becomes a name, rather than serving as a locator. Given that *both* domain names and Internet protocol (IP) addresses are by definition locators rather than denominators,¹⁵ domain names could only be protected as trademarks to the extent that they function as names rather than as addresses.

This point was largely lost in the succeeding scramble over control of prominent or readily recognized domain names.¹⁶ A generation of “cybersquatters” acquired recognizable domain names on a first-come, first-served basis, then sought to resell

8. See Dawn C. Nunziato, *Freedom of Expression, Democratic Norms, and Internet Governance*, 52 EMORY L.J. 187, 193 (2003).

9. See, e.g., *id.* at 204–05.

10. See *id.*

11. See *id.* at 206.

12. Dan L. Burk, *Trademarks Along the Infobahn: A First Look at the Emerging Law of Cybermarks*, 1 RICH. J.L. & TECH. 1, ¶ 12 (1995), <http://jolt.richmond.edu/v1i1/burk.html>.

13. See *id.*

14. See *id.* ¶ 23.

15. See *id.* ¶ 12.

16. Although, the point was not entirely lost on a few courts. See, e.g., *Bird v. Parsons*, 289 F.3d 865, 878 (6th Cir. 2002) (distinguishing the identifying function of domain names from trademark usage); *Lockheed Martin Corp. v. Network Solutions, Inc.*, 985 F. Supp. 949, 956–58 (C.D. Cal. 1997), *aff'd*, 194 F.3d 980 (9th Cir. 1999) (same).

those names to the owners of cognate trademarks.¹⁷ Trademark owners responded with infringement suits,¹⁸ the domain name governance authority instituted its own alternative dispute resolution (ADR) process,¹⁹ the Internet domain name governance system came under fire and was reorganized,²⁰ and the U.S. Congress weighed in with a federal statute that was likely premature and was certainly poorly conceived.²¹ Debates raged over the governance of domain names and IP addresses, over the expansion of name space by designation of new top level domains, and over “reverse” domain name hijacking by which trademark owners themselves used their newly minted legal recourse to wrest cognate domain names away from legitimate users.²²

After numerous court opinions, registrar dispute decisions, and interminable commentary, the problem of domain names appears to have settled into a sort of uneasy equilibrium in which issues and disputes over domain names remain, but have become sufficiently familiar that they are now simply part of the furniture in electronic commerce. While the resolutions to domain name disputes remain imperfect and even problematic, they no longer dominate the discussion over Internet trademarks, perhaps because newer technologies have taken the spotlight. For example, even as the dispute over domain names

17. See Nunziato, *supra* note 8, at 204–05.

18. See, e.g., *Avery Dennison Corp. v. Sumpton*, 189 F.3d 868, 880 (9th Cir. 1999); *Brookfield Commc'ns, Inc. v. W. Coast Entm't Corp.*, 174 F.3d 1036, 1043 (9th Cir. 1999); *Jews for Jesus v. Brodsky*, 993 F. Supp. 282, 286–87 (D.N.J. 1998), *aff'd*, 159 F.3d 1351 (3rd Cir. 1998); *Intermatic Inc. v. Toeppen*, 947 F. Supp. 1227, 1234 (N.D. Ill. 1996); *Panavision Int'l, L.P. v. Toeppen*, 945 F. Supp. 1296, 1298 (C.D. Cal. 1996), *aff'd*, 141 F.3d 1316 (9th Cir. 1998).

19. See A. Michael Froomkin, *ICANN's "Uniform Dispute Resolution Policy": Causes and (Partial) Cures*, 67 BROOK. L. REV. 605, 608 (2002); Laurence R. Helfer & Graeme B. Dinwoodie, *Designing Non-National Systems: The Case of the Uniform Domain Name Dispute Resolution Policy*, 43 WM. & MARY L. REV. 141, 149 (2001); Milton Mueller, *Rough Justice: A Statistical Assessment of ICANN's Uniform Dispute Resolution Policy*, 17 INFO. SOC'Y 151, 152 (2001).

20. See Susan Crawford, *The ICANN Experiment*, 12 CARDOZO J. INT'L & COMP. L. 409, 415 (2004); A. Michael Froomkin, *ICANN 2.0: Meet the New Boss*, 36 LOY. L.A. L. REV. 1087, 1088 (2003); Jay P. Kesan & Andres A. Gallo, *Pondering the Politics of Private Procedures: The Case of ICANN*, 4 I/S: J.L. & POL'Y FOR INFO. SOC'Y 345, 349 (2008).

21. See Suzanna Sherry, *Haste Makes Waste: Congress and the Common Law in Cyberspace*, 55 VAND. L. REV. 309, 310–11 (2002).

22. See Froomkin, *supra* note 19, at 623, 629.

was unfolding, trademark disputes emerged in regard to another Internet technology, that of search engines.²³

B. AUTOMATED SEARCH

Like the domain name system (DNS), search engines were intended to help classify and locate information on the Internet,²⁴ but search engines are less reliant than the DNS on human memory as the mechanism to locate Internet resources. Instead, search engines employ a combination of software functions to organize web page content.²⁵ First, the search engine typically employs a “bot”—short for robot²⁶—or “spider” or “crawler”—from the mixed metaphor of “crawling” the world wide “web”—that will automatically retrieve content from servers on the Internet.²⁷ The content is then analyzed and indexed according to some database algorithm.²⁸ Different search engines use different criteria for indexing, and different algorithms for determining the associations and rankings in their databases: some use the number of links on a page, or the number of links to a page, or the lexical content of the page, or a combination of factors.²⁹ But in any of these systems, the delivery and ranking of pages is connected to keywords that appear on those pages.

Finally, the search engine includes some user search function that will allow the indexed content to be retrieved via a graphic interface when related keywords are entered as search terms by a user. Search results are typically delivered as a list of hypertext links that allow the user to retrieve the original content from its originating server when clicked.³⁰ Search results are displayed in some order of relevance determined by

23. For an overview of search engines and associated legal issues, see James Grimmelmann, *The Structure of Search Engine Law*, 93 IOWA L. REV. 1 (2007).

24. *Id.* at 6.

25. See JOHN BATTELLE, *THE SEARCH: HOW GOOGLE AND ITS RIVALS RE-WROTE THE RULES OF BUSINESS AND TRANSFORMED OUR CULTURE* 20 (2005).

26. See Gove N. Allen et al., *Academic Data Collection in Electronic Environments: Defining Acceptable Use of Internet Resources*, 30 MGMT. INFO. SYS. Q. 599, 603 (2006), available at <http://gove.net/home/pdf/academicdatacollection.pdf>.

27. See PRESTON GRALLA, *HOW THE INTERNET WORKS* 187 (6th ed. 2002).

28. *Id.*

29. See *id.*; Lucas D. Introna & Helen Nissenbaum, *Shaping the Web: Why the Politics of Search Engines Matters*, 16 INFO. SOC'Y 169, 171–72 (2000).

30. See GRALLA, *supra* note 27, at 188–89.

the algorithm of the search function.³¹ Many of the early disputes regarding search engines stemmed from the limitations of such two-dimensional, sequential displays in communicating the results of a search to the user. The advantages to website operators of being noticed and prominently displayed among the first results of a search engine query led to a proliferation of methods for “search optimization”—that is, for increasing the likelihood of a higher rank in the displayed results, and so hopefully garnering more attention from those conducting searches.³²

Early web search engines relied heavily on the lexical content of pages for their indexing algorithms. One strategy for manipulating algorithms that classified and ranked web pages according to their content was to invisibly embed keywords in the text of the page.³³ This could be accomplished, for example, by including the text of a keyword multiple times in the same color as the background of the page, so that the text would be imperceptible to human readers, but would still be detected by software that looks at the page’s code, not the page’s visible color.

Alternatively, search engines relied on the “metatags” embedded in the HTML code of the web page.³⁴ Such code is not displayed in the normal course of viewing a web page, although most web browsers can reveal the codes when a viewer desires to see them.³⁵ But most significantly, the codes are seen by the software that is indexing the page. Web page designers found that it was possible to manipulate or alter the indexing of web pages by clever use of metatags, or by calculated construction of a page’s lexical content.³⁶ The use of metatags or keyword texts on web pages was intended ultimately to attract consumer attention, but the method of accomplishing this was to influence the delivery of search results to consumers by manipulating the indexing functions of the search engine.

31. See Inrona & Nissenbaum, *supra* note 29, at 174.

32. *Id.*

33. *Id.* The practice was sometimes known as “spamdexing,” a portmanteau of “indexing” and “spam.” See Ira S. Nathenson, *Internet Infoglut and Invisible Ink: Spamdexing Search Engines with Meta Tags*, 12 HARV. J.L. & TECH. 43, 46 (1998).

34. See generally JENNIFER NIEDERST, *WEB DESIGN IN A NUTSHELL: A DESKTOP QUICK REFERENCE* 111–14 (2d ed. 2001) (defining metatags and describing their use).

35. See *id.*

36. See *supra* note 33 and accompanying text.

Emblematic among the opinions considering this technology is the Ninth Circuit's decision in *Playboy Enterprises, Inc. v. Welles*.³⁷ The plaintiff, a well-known adult entertainment company, objected to a website operated by Terri Welles, a former Playboy magazine model who had been Playboy's "Playmate of the Year" for 1981.³⁸ Playboy sued its former model for, inter alia, use of the registered trademarks "Playboy" and "Playmate" in the site's HTML metatags.³⁹ The court held that the use of the terms "playboy" and "playmate" in the metatags of the website constituted a truthful "nominative" use of the marks: Ms. Welles had in fact been selected by Playboy magazine as a playmate, and there was no other feasible terminology to describe her status to consumers who might be searching for her web pages.⁴⁰ But not all of the Playboy references on the web page were deemed nominative uses. Somewhat oddly, the court held that the repetition of the acronym "PMOY '81," for "Playmate of the Year 1981" in the web page background was not "necessary" to describe Ms. Welles, and so did not qualify as nominative use,⁴¹ even though the function of the repeated acronym was the same as that of the metatags: to optimize the index and retrieval of the web page in search engines.

C. KEYWORD ADVERTISING

Although the technology of Internet search subsequently shifted away from metatag indexing, trademark disputes remained at the forefront of cyberlaw. More recent cases have wrestled with the use of trademarks as keywords associated with advertising, for example in the context of "pop-up" windows connected to web browsers.⁴² Such pop-ups might be triggered by a software application that detects a keyword on a website viewed by the consumer; the software then delivers an advertisement associated with the keyword. Where the keyword is a trademark, the advertisement could well promote the product or service of the mark owner's competitor.⁴³ This type

37. 279 F.3d 796 (9th Cir. 2002).

38. *Id.* at 799.

39. *Id.* at 800.

40. *Id.* at 803.

41. *Id.* at 804.

42. *See, e.g.*, *1-800 Contacts, Inc. v. WhenU.com, Inc.*, 414 F.3d 400, 407-08 (2d Cir. 2005); *Wells Fargo & Co. v. WhenU.com, Inc.*, 293 F. Supp. 2d 734, 736 (E.D. Mich. 2003); *U-Haul Int'l, Inc. v. WhenU.com, Inc.*, 279 F. Supp. 2d 723, 724 (E.D. Va. 2003).

43. *See, e.g.*, *1-800 Contacts*, 414 F.3d at 407-08.

of technology was at issue, for example, in the Second Circuit's decision in *1-800 Contacts, Inc. v. WhenU.com, Inc.*⁴⁴ The Second Circuit held that the use of a competitor's trademark to trigger a pop-up advertisement was not a trademark "use" because the directory in which the triggering keyword was embedded was unseen by users, and inaccessible to the public.⁴⁵

The most recent set of controversies over Internet trademarks come from the related practice of search engines displaying sponsored advertising along with search results, prompted by the keywords used in the search. For example, in the Google Adwords program, advertisers are allowed to select a variety of keywords that will prompt the display of their paid ads.⁴⁶ As in the case of pop-up advertisements, some keywords might constitute trademarks, and trademark holders have objected to the display of competitor's ads triggered by their trademark.⁴⁷ Although some courts have applied reasoning similar to that in the *1-800 Contacts* decision to sponsored advertising,⁴⁸ more recent appellate opinions seem inclined to say that prompting competing advertising with a trademark keyword constitutes a form of infringement.⁴⁹

II. CYBERMARKS AS CODE

Having sketched the broad outlines of the history of Internet trademark disputes to date, I hope to make it apparent that there is a common thread to these cases, and it is not merely that they happen to be styled as trademark claims. We begin by considering the metatag cases. Although in some sense these cases may seem irrelevant, since this technique is no longer commonly used for search engine web indexing, the metatag cases nonetheless provide an important insight into all the trademark cases we have reviewed. This is because the metatag cases present the most extreme version of the puzzle that is

44. *Id.*

45. *Id.* at 409; accord *Wells Fargo*, 293 F. Supp. 2d at 762–74; *U-Haul Int'l*, 279 F. Supp. 2d at 725.

46. See BATTELLE, *supra* note 25, at 124–26.

47. See, e.g., *Hearts on Fire Co. v. Blue Nile, Inc.*, 603 F. Supp. 2d 274, 277 (D. Mass. 2009); *Boston Duck Tours, LP v. Super Duck Tours, LLC*, 527 F. Supp. 2d 205, 206 (D. Mass. 2007).

48. See, e.g., *Rescuecom Corp. v. Google Inc.*, 456 F. Supp. 2d 393, 403 (N.D.N.Y. 2006), *vacated*, 562 F.3d 123 (2d Cir. 2009); *Merck & Co. v. Mediplan Health Consulting, Inc.*, 425 F. Supp. 2d 402, 415 (S.D.N.Y. 2006).

49. See *Rescuecom Corp. v. Google Inc.*, 562 F.3d 123, 129–31 (2d Cir. 2009).

common to the various Internet trademark situations. The metatag cases pose the puzzle in the starkest possible form.

A. MACHINE-READABLE MARKS

The puzzle of the metatag cases is this: the cases consider the legitimacy or illegitimacy of using well-recognized trademarks as metatags. But the legal problem in trademark cases is always the likelihood of confusion between the protected mark and the accused infringing mark.⁵⁰ Or, in trademark dilution cases, the problem is the potential to dilute or blur the distinctiveness of the protected mark in the minds of consumers.⁵¹ Yet metatags are not intended to be seen by humans, and absent an uncommon degree of technical skill would never be seen by consumers.⁵² This is true whether we are considering the HTML-coded metatags, which like other HTML codes are not usually displayed by a web browser, or whether we are considering the use of trademarks as web page text hidden by color camouflage in the background of the document. In each case the “trademark” for which the use is contested is found in code read by a machine—the indexing “spider” or “bot” of a web search engine—and is hidden from the perception of lay Internet users.

So it is rather difficult to say that consumers are confused or that their perceptions are diluted by metatags. The consumers who are necessarily part of the legal claim in a trademark case would have had no opportunity to blur or confuse the metatags with anything; they would have seen only search results that were influenced by the deployment of metatags. The objection in the cases was not that the consumers entered trademarks as keywords into the search engine; the mark owners were presumably delighted that consumers were searching using their marks. The owners instead objected to the results that were returned due to the unseen metatags. So where was the consumer confusion? Certainly, the metatags created associations in the database of the search engine, but a search engine is not a consumer. It could hardly be said that the machine is likely to be confused by the metatag, or that the mark would be less distinctive in the mind of the search engine due to the metatag. Inappropriate mechanical association regarding a mark

50. See 4 J. THOMAS MCCARTHY, MCCARTHY ON TRADEMARKS AND UNFAIR COMPETITION § 23:1 (4th ed. 2007).

51. *Id.* § 24:67.

52. See *supra* text accompanying note 35.

is not a trademark claim; only inappropriate consumer association regarding the mark is a trademark claim.

Metatag cases present the most extreme version of this problem, but they are not unique. A similar situation is presented in the advertising pop-up cases, where the roster of keywords that would trigger an advertisement was unseen by, and inaccessible to, the browser user. Some of the pop-up cases in fact explicitly recognized the lack of consumer awareness as a factor in determining the case's outcome.⁵³ This logic has been extended to keyword searching cases; several Second Circuit Court opinions, following the logic of the *1-800 Contacts* opinion, held that "internal" uses of a trademark within search technology were not actionable as infringement.⁵⁴ The more recent appellate opinion in *Rescuecom Corp. v. Google Inc.* amends this line of reasoning, holding that "internal" use of a mark is not automatically sufficient to compel a finding that the use as an advertising keyword is not trademark "use."⁵⁵ But the court in that case had to go to some length to find a situs for "consumer" confusion, finally—and dubiously—settling on the selection of the trademark "adwords" by advertisers as the moment of potential "confusion."⁵⁶

The fact that the "trademarks" in such cases were "read" by machines, but not by consumers, is a key insight to the puzzle of Internet cybermarks. The conclusion in the *Rescuecom* case, that "internal" use of a trademark is not itself dispositive of the legal issues,⁵⁷ is correct, although I would suggest that it is perhaps not correct in quite the way that the court intended. The question is not whether a string of characters, that when visualized would constitute a trademark, is used "internally" or "externally," visibly or invisibly, in the operation of the search technology. The question is whether the character string is being used as a *mechanism* in search technology. Analytically, the use of the character string as a component of search is more apparent in the cases where the search string functions "internally," without display of the characters to consumers. The

53. *1-800 Contacts, Inc. v. WhenU.com, Inc.*, 414 F.3d 400, 409 (2d Cir. 2005); *U-Haul Int'l, Inc., v. WhenU.com, Inc.*, 279 F. Supp. 2d 723, 728 (E.D. Va. 2003).

54. *S&L Vitamins, Inc. v. Austl. Gold, Inc.*, 521 F. Supp. 2d 188, 199–202 (E.D.N.Y. 2007); *Merck & Co. v. Mediplan Health Consulting, Inc.*, 425 F. Supp. 2d 402, 415 (S.D.N.Y. 2006).

55. *Rescuecom Corp. v. Google Inc.*, 562 F.3d 123, 129–30 (2d Cir. 2009).

56. *Id.* at 125–26, 130–31.

57. *Id.* at 129–30.

search technology designs that involve “internal” use help bifurcate the search mechanism function from the consumer recognition function—and, as a corollary, consumer confusion seems unlikely where the consumer cannot observe the character string.

Search terms or domain names entered into a field on a screen display are less obviously search mechanisms, as they are seen by people as well as by machines. But search mechanisms that are perceptible to the consumer are no less mechanisms. Consider by analogy a two-dimensional pattern such as the universal price code (UPC) bar code or similar optical coding that identifies and tracks the product to which it is affixed.⁵⁸ We can imagine that such codes might gain secondary meaning, or perhaps even be inherently distinctive, since the code patterns are arbitrary in relation to the products they label.⁵⁹ Probably very few consumers pay close enough attention to the details of bar codes to associate them with source, but in principle there is no reason that this association could not occur. However, even if they were communicative of source, such code labels are clearly *functional*, as they are a device in an automated identification and tracking system.⁶⁰ They are as much an operational component of the tracking and inventory system as the laser scanner that reads them or the electronic media that interprets them. The optical codes may be printed symbolic indicia, but they are equivalent to the physically configured code of a mechanical device such as tumblers in a hardware lock,⁶¹ or to the coded array of voltages across a data processing device. Indeed, the information in the optical codes is translated into exactly such voltages in the context of the system to which they belong.

58. See CHARLES PETZOLD, *CODE: THE HIDDEN LANGUAGE OF COMPUTER HARDWARE AND SOFTWARE* 79 (1999).

59. *Cf., e.g., Moore Bus. Forms, Inc. v. Nat'l Computer Sys., Inc.*, 211 U.S.P.Q. (BNA) 909, 916–17 (T.T.A.B. 1981) (denying trademark registration to distinctive optical scanning patterns). Interestingly, the Second Circuit has held in an opinion by Judge Leval, author of the *Rescuecom* opinion, that removal of UPC codes from product packaging may be a form of trademark infringement because it impairs the mark holder's ability to control product quality. *Zino Davidoff SA v. CVS Corp.*, 571 F.3d 238, 242–44 (2d Cir. 2009).

60. See PETZOLD, *supra* note 58, at 80–83.

61. *Cf. NAT'L COMM'N ON NEW TECHNOLOGICAL USES OF COPYRIGHTED WORKS, FINAL REPORT OF THE NATIONAL COMMISSION ON NEW TECHNOLOGICAL USES OF COPYRIGHTED WORKS* 29 (1978) (Hersey, Comm'r, dissenting) (noting that software is equivalent to a mechanical device).

The same is true of keywords, metatags, or domain names. The entry of alphabetic symbols into a search engine by a consumer is a mediated convenience; strings of letters are automatically translated by intervening layers of software into codes recognized by the machines that comprise the search system.⁶² Presumably, a computer-savvy Google searcher could enter searches formulated in ASCII⁶³ or hexadecimal code equivalent⁶⁴ to the symbolic strings of letters constituting "Rescuecom" or "U-Haul" and retrieve the same results, including the same keyword advertisements. Such coded strings would not be immediately recognizable as trademarks, although they would be the logical and technical equivalents of "Rescuecom" or "U-Haul," holding the same search relationships as the versions that are more readily recognized by a lay searcher. Layering the trademarks on top of such symbolic strings adds a measure of user-friendliness to the search mechanism, and also adds the complication of trademark source association, but the search function of the symbols that are entered remains exactly the same.

Thus, at one level, search terms are human-recognizable strings of letters that appear to comprise a trademark. At another level, the domain name or search term represents a series of sequences of bits that may be portrayed as the ones and zeroes of binary code.⁶⁵ The representation in binary itself portrays a series of voltages that are manipulated across the circuits of a computer's hardware.⁶⁶ These differing levels of representation constitute a convenience; search engine users do not need to know programming languages, much less have to manually set the logic gates of a computer to perform a search—as was the case with the earliest computers, where programming was done by physically setting switches by hand.⁶⁷ Software that is largely incomprehensible and inaccessible to the lay user does most of the complicated logical and physical work that goes on within the device.⁶⁸ But it should be clear that the terms that are entered into the search mechan-

62. See GRALLA, *supra* note 27, at 187–89.

63. See PETZOLD, *supra* note 58, at 286–92.

64. See *id.* at 183–89.

65. See *id.* at 69–85.

66. See RON WHITE, *HOW COMPUTERS WORK* 45 (8th ed. 2006).

67. DANIEL APPLEMAN, *HOW COMPUTER PROGRAMMING WORKS* 14–15 (2000).

68. See *id.*

ism are part of the device, and are themselves operational devices in the process of information indexing and search. They are very much “cybermarks” in the sense of controlling or mediating the function of a machine.

B. MARKS THAT BEHAVE

One initial objection to this characterization of cybermarks might be that it is overly reductionist. So metatags or keywords or domain names are in fact strings of bits that appear as a mark; but perhaps by the same logic confusing advertisements or counterfeit labels are collections of atoms that appear as a mark, and perhaps the former should be just as objectionable to the trademark holder as the latter? This objection is fairly easily answered: mere display of a trademark is static; billboards and labels are not mechanisms of search in the same sense that a metatag or domain name is. Cybermarks, like other software scripts, are strings of code that “behave.”⁶⁹ Billboards or labels are substrates that carry information that can be associated in the mind of the consumer with product source; but they do not themselves execute a process of association.

The distinction between static trademarks and dynamic cybermarks, between association of concepts in the “wetware”⁷⁰ of the consumer’s brain and the association of code in the hardware or software of data processors, is critical to sorting out the problem of Internet trademark controversies. The software behind search engines, domain name servers, and keyword advertising implements an associational logic between the formal representation of certain symbols and other stored information. It is part of the system that sequences, orders, and routes information in data processing—what Yochai Benkler has dubbed the “logical layer” of an information technology, as opposed to the “physical layer” or substrate on which the information is carried, and the “content layer” or substantive information that is carried by the logical and physical layers.⁷¹ Benkler’s hierarchy offers a handy rubric for conceptualizing

69. See Samuelson et al., *supra* note 5, at 2316–20.

70. “Wetware” is “the human brain or a human being considered esp[ecially] with respect to human logical and computational capabilities.” MERRIAM-WEBSTER’S COLLEGIATE DICTIONARY 1423 (11th ed. 2003).

71. Yochai Benkler, *From Consumers to Users: Shifting the Deeper Structures of Regulation Toward Sustainable Commons and User Access*, 52 FED. COMM. L.J. 561, 562 (2000); see also LAWRENCE LESSIG, *THE FUTURE OF IDEAS: THE FATE OF THE COMMONS IN A CONNECTED WORLD* 23–25 (2001) (applying the layers concept to different communications media).

the structure of digital media⁷² and for recognizing the general roles played by different components in a data processing system.

Of course the division between the logical layer and the physical layer of an information system is never so pristine as Benkler's hierarchy might on its face seem to suggest. The logic functions of the machine, while conceptually separable from its apparatus, may in fact be constituted by the physical layer. The logic of the machine may be embedded in the physical apparatus that makes up the machine, as in the case of an old-style gear-driven adding machine,⁷³ or in the differential voltages across the circuits of a semiconductor chip.⁷⁴ In current computing devices, separating the logical design of software from the material design of hardware can be problematic; the two are inextricably intertwined.⁷⁵ Indeed, it is well-understood in computer design that software and hardware are largely interchangeable for coding purposes.⁷⁶ Data processing functions can be implemented as either software or hardware, software being somewhat easier to change.⁷⁷ But conceptually we can see that data processors do have an intrinsic logic, even if it is distributed across different components of the system.

This distinction similarly bears on the objection that the characterization I have offered for "cybermarks" might be offered, at least to some extent, of perceptible, wholly communicative marks that are carried by digital media. A trademark logo displayed on a computer screen, or an advertising jingle played over a computer speaker, can be represented as source code

72. Or for that matter, almost any media. For example, one could equally well conceptualize a printed book in the same fashion, constituting a physical layer (paper, stitching, covers), a logical layer (chapters, pagination, paragraphs, grammar, and syntax) and a content layer (the subject and meaning of the printed text). Cf. LESSIG, *supra* note 71, at 24 (demonstrating how the layers approach can be applied to a variety of different communications systems).

73. Or more elaborately, in the gear-driven analog calculations of the "difference engines" designed by Charles Babbage, but not built until more than a century after his death. See PETZOLD, *supra* note 58, at 240; DORON SWADE, *THE DIFFERENCE ENGINE: CHARLES BABBAGE AND THE QUEST TO BUILD THE FIRST COMPUTER 1-6* (2000).

74. PETZOLD, *supra* note 58, at 247-49; WHITE, *supra* note 66, at 45, 58-59.

75. Cf. Pamela Samuelson, *CONTU Revisited: The Case Against Copyright Protection for Computer Programs in Machine-Readable Form*, 1984 DUKE L.J. 663, 680 (describing the "complex hierarchy of programs and hardware" that work together as a "virtual machine").

76. See Samuelson et al., *supra* note 5, at 2319.

77. See PETZOLD, *supra* note 58, at 232.

script, as machine readable binary, and at some level comprise sets of voltages across the circuits of a microchip.⁷⁸ Yet these digitized trademark representations are not functional in the same sense as the key words or domain names under consideration here. Even at the machine level, trademark representations are not part of Benkler's "logical layer." Display output may be more amenable to classification as "content" or "data" rather than as part of the computer software, although distinctions between software and data are always difficult to draw.⁷⁹ Content storage always incorporates instructions for reproducing the content to the extent that displayed trademarks might be regarded as constituting computer instructions, they are trivially so, no more so than any other digitized information must be. Certainly they are not constitutive of the relational architecture of the machine.

In the case of search engines or domain names, or even pop-up advertisements, the logic of the device reflects the mental associations of the information it indexes, stores, and retrieves. To be useful as a search device, the database attempts to map and replicate the most likely associations that will occur in the mind of the user. The difficulty in the Internet trademark cases is the proper status of trademarks, typically word marks, within an information storage and retrieval system. The question that is squarely presented is whether translating a consumer's mental associations regarding a trademark term into an indexing apparatus can somehow constitute trademark infringement, and thus whether the owner can object to the use of the mark and its logical relations as a part of an associational apparatus.

C. THE LOGIC OF SEARCH

The temptation to answer too quickly the question in the affirmative—as occurred with the domain name cases⁸⁰—stems from the fact that trademarks are themselves based upon certain mental associations.⁸¹ Trademarks have always been in some sense the instruments of search and indexing, for assist-

78. See *id.* at 260–62.

79. See Dan L. Burk, *The Mereology of Digital Copyright*, 18 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 711, 724 (2008).

80. See *supra* Part II.A.

81. Cf. Rebecca Tushnet, *Gone in 60 Milliseconds: Trademark Law and Cognitive Science*, 86 TEX. L. REV. 507, 508–17 (2008) (reviewing and critiquing neuroscientific studies on trademark associations).

ing consumers in sorting through the different competing products in the market. The most prevalent economic theories regarding trademarks hold that they are useful for reducing consumer *search* costs.⁸² The stated value of a mark, and its eligibility for trademark protection, lies in the association of the symbol with some producer of goods or services.⁸³ It is the logic of the relation between symbol and source that constitutes distinctiveness or “secondary” meaning, the necessary criteria for protection of a mark.⁸⁴ Infringement consists of inducing or encouraging a new and unauthorized association between the mark and a different product or source, an association that might disrupt the logical link between symbol, product, and source.⁸⁵

But there are myriad other associations, unrecognized by trademark law, that remain beyond the remedies of trademark law. As with any symbol, the associations that attach to a trademark are not monovalent.⁸⁶ The Coca-Cola Company has not authorized, and probably does not approve of, its mark being associated with osteoporosis,⁸⁷ obesity,⁸⁸ or American imperialism,⁸⁹ but trademark law does not properly provide a remedy for such unwanted associations. Such nonsource associations are integral to the logic of search. Search logic maps the associations most likely to locate desired information, and such associations are not necessarily those between mark and source.

82. See 1 MCCARTHY, *supra* note 50, § 2:5 (“Another important economic function of trademarks is that they reduce the customer’s cost of collecting information about products.”); Stacey L. Dogan & Mark A. Lemley, *Trademarks and Consumer Search Costs on the Internet*, 41 HOUS. L. REV. 777, 786–88 (2004).

83. See 1 MCCARTHY, *supra* note 50, § 3:4.

84. See 2 *id.* § 11:2 (discussing the meaning and importance of “distinctiveness”); *id.* § 15:1 (introducing “second meaning”).

85. See 4 *id.* § 23:1.

86. See Rochelle Cooper Dreyfuss, *Expressive Genericity: Trademarks as Language in the Pepsi Generation*, 65 NOTRE DAME L. REV. 397, 412–24 (1990) (discussing multiple uses of trademark words in language).

87. See, e.g., Fernando Guerrero-Romero et al., *Consumption of Soft Drinks with Phosphoric Acid as a Risk Factor for the Development of Hypocalcemia in Postmenopausal Women*, 52 J. CLINICAL EPIDEMIOLOGY 1007, 1008 (1999).

88. Vasanti S. Malik et al., *Intake of Sugar-Sweetened Beverages and Weight Gain: A Systematic Review*, 84 AM. J. CLINICAL NUTRITION 274, 275–82 (2006); Lenny R. Vartanian et al., *Effects of Soft Drink Consumption on Nutrition and Health: A Systematic Review and Meta-Analysis*, 97 AM. J. PUB. HEALTH 667, 669–70 (2007).

89. Ted Friedman, *The World of the World of Coca-Cola*, 19 COMM. RES. 642, 649 (1992) (criticizing Coca-Cola’s ethnocentrist ideology).

Every designator in the language is subject to multivalent logical associations, some within the contemplation of trademark law and most beyond it, but all of which are necessary to the function of indexing. The marks "Coca-Cola" and "Pepsi-Cola" are surely related in the minds of consumers, and properly so: the brands are likely associated as business rivals, as market alternatives, as subcategories of the genre of "soft drinks" or "soda-pop."⁹⁰ These associations are entirely distinct from the trademark concern of associating Coca-Cola with the source of Pepsi-Cola or vice versa. Taking account of such associations is properly part of the design of search logic, whether or not they are part of the design of trademark logic.

To some extent, the character of the automated search technology associated with cybermarks may tend to obscure this logic. But the issue obscured by automated technology can be isolated by translating the logic of association into analogous older technologies. When considered in an offline, non-automated context, the proposition of protecting an index function becomes less appealing, even absurd. Google keyword advertising, or When-U browser pop-up advertising, place a competitor's advertisement in close proximity to a given mark, generating an automated display that is triggered by an association with that mark. But as previous commentators have pointed out, such proximity based on association would not be considered at all unusual or legally objectionable in hardcopy indices.⁹¹ Competitors' advertising routinely appears in close proximity in a variety of print media, such as catalogs or directories.⁹² Indeed, commercial producers might well intentionally take out paid advertising space near the listing of a rival producer in a magazine or yellow pages telephone directory, and may well expect that their advertisement will draw more eyes or garner more attention due to its proximity near that of a well-known competitor. Physical proximity creates an association between the concepts, but not necessarily an association as to source.

A similar result follows in a context without advertising, but where, as in the case of metatags or domain names, infor-

90. See generally J.C. LOUIS & HARVEY Z. YAZIJIAN, *THE COLA WARS* (1980) (chronicling the history of and competition between the Coca-Cola Company and PepsiCo, Inc.).

91. See, e.g., Greg Lastowka, *Google's Law*, 73 BROOK. L. REV. 1327, 1401-02 (2008).

92. Dogan & Lemley, *supra* note 82, at 809.

mational items are indexed according to their association with a mark. This would be the case for an old-fashioned library card catalog or print encyclopedia where entries are indexed by keyword. Such keywords might be expected to include trademarks, say for example, "Coca-Cola." The index might well include references pointing to materials that include competitors' marks, to materials unrelated to the relationship between product and source, or to materials objectionable to the mark holder. The logic of search might well dictate that a "Coca-Cola" entry be associated not merely with generic terms such as "soft drink" or "soda pop," or with "Atlanta," but with "James Cagney" and "Billy Wilder,"⁹³ or even "cocaine,"⁹⁴ as well also with other manufacturers' products, including its rival soft drink producer, "Pepsi-Cola."⁹⁵

It seems plainly absurd to allow a trademark holder to enjoin or restrict the use of its trademark as a keyword or search term to locate materials logically associated with that mark in a telephone directory, business index, or card catalog. It is unclear why it should matter to us if the catalog, rather than composed of paper leaves or pasteboard cards, is modernized into an automated online index. And it is equally unclear why in either instance we should care if one advertiser or the other paid to have their entry in the index. Courts reviewing the Google Adwords program seem offended that advertisers can pay to have their competitor's marks flagged as search terms,⁹⁶ but this seems a judicious way to ration search resources and maintain the logic of search. An ambitious advertiser might well prefer that his ads appear no matter what search terms are entered into the database, but requiring a payment for each search term flagged is precisely the strategy most likely to limit the advertiser to designating only those terms relevant to the advertiser's potential customers.

93. Cinema star James Cagney's last leading role was playing a Coca-Cola executive in *Cold War West Berlin* in the comedy film *One, Two, Three*, directed by Billy Wilder. *ONE, TWO, THREE* (Mirisch Company 1961). The film contains frequent references to both the Coca-Cola product and the Coca-Cola company. *See id.*

94. The original formulation of Coca-Cola contained nontrivial doses of cocaine. MARK PENDERGRAST, *FOR GOD, COUNTRY, AND COCA-COLA: THE DEFINITIVE HISTORY OF THE GREAT AMERICAN SOFT DRINK AND THE COMPANY THAT MAKES IT* 53 (2d ed. 2000).

95. *See* LOUIS & YAZIJIAN, *supra* note 90, at 80.

96. *See, e.g.,* *Rescuecom Corp. v. Google Inc.*, 562 F.3d 123, 129–30 (2d Cir. 2009).

The only relevant association for purposes of trademark law is one that connects mark with source, and the only relevant objection under trademark law is a substitution of that association with another source association that would confuse or deceive consumers.⁹⁷ There is a large number of logical associations that might legitimately arise between a mark and other referents, and the majority of those associations have little to do with the source association or “secondary meaning” of the mark.⁹⁸ Certainly trademark owners might desire control over every association with their marks, and there has been an unfortunate movement by some courts in the direction of such control.⁹⁹ However, not all associations with a trademark are the subject of trademark protection, nor actionable as infringement, nor under the control of the trademark holder. Despite the recent tendency of courts to view trademark ownership as encompassing an exclusive “right to evoke”¹⁰⁰ associations with the mark, trademark law of necessity recognizes that some logical associations besides the association to source are inevitable, necessary, and even desirable. Thus, the trademark doctrines of nominative use, fair use, and trademark use, while constituting a somewhat confused and confusing welter of overlapping legal standards,¹⁰¹ share the common quality of excluding from the ambit of trademark exclusivity nonsource associations of the mark. Such nonsource association, whether by proximity or logical relation, cannot be the basis for infringement.

III. COMPARATIVE INTERMEZZO

This observation—that the strings of symbols used for domain names, metatags, and search terms are simultaneously functional and communicative—should likely come as no surprise.¹⁰² Copyright law has struggled with essentially the same

97. See Mark A. Lemley & Mark McKenna, *Irrelevant Confusion*, 62 STAN. L. REV. 413, 415 (2010).

98. See Dreyfuss, *supra* note 86, at 400–02.

99. See Stacey L. Dogan & Mark A. Lemley, *Grounding Trademark Law Through Trademark Use*, 92 IOWA L. REV. 1669, 1670–71 (2007); Mark A. Lemley, *The Modern Lanham Act and the Death of Common Sense*, 108 YALE L.J. 1687, 1697–713 (1999).

100. Stacey L. Dogan, *An Exclusive Right to Evoke*, 44 B.C. L. REV. 291, 292–98 (2003).

101. See William McGeeveran, *Rethinking Trademark Fair Use*, 94 IOWA L. REV. 49, 51 (2008).

102. See David McGowan, *From Social Friction to Social Meaning: What*

problem for at least the last three decades, since the commercial proliferation of computer software technology in the mid-twentieth century.¹⁰³ Patent law, too, has had a similarly uneasy relationship with computer code as subject matter.¹⁰⁴ The prior difficulties in these areas of intellectual property are instructive with regard to the problem of cybermarks.

A. FUNCTIONAL SUBJECT MATTER

Congress explicitly placed computer software within the purview of the copyright statute,¹⁰⁵ which had previously been thought to encompass only artistic and cultural works,¹⁰⁶ and which continues to entail strong prohibitions against copyright protection for useful articles.¹⁰⁷ Indeed, the copyright rule against utilitarian subject matter stretches back at least to the celebrated Supreme Court decision in *Baker v. Selden*.¹⁰⁸ In *Baker*, the Court asserted that utilitarian innovations such as the accounting method at issue in the case are matters for patent law and belong in the Patent Office, not in the copyright system.¹⁰⁹

The copyright prohibition against utilitarian works also appears in the specific statutory prohibition on extending the category of “[p]ictorial, graphic, and sculptural works” to encompass useful articles—the place where the prohibition was traditionally most likely to collide with copyrightable subject matter.¹¹⁰ Works in this category are often constructed around some functional artifact. The rule developed for dealing with the collision between copyright in the work and the prohibition on copyright for the functional embodiment has been that if the esthetic or artistic portion of an item is physically or concep-

Expressive Uses of Code Tell Us About Free Speech, 64 OHIO ST. L.J. 1515, 1536 (2003) (arguing that “all expression is functional”). Unfortunately, McGowan’s claim quickly slides into the fallacy of functionality that I identify below. See discussion *infra* Parts V.A–B.

103. See Dennis S. Karjala, *A Coherent Theory for the Copyright Protection of Computer Software and Recent Judicial Interpretations*, 66 U. CIN. L. REV. 53, 56–66, 105–12 (1997).

104. See Samuelson, *supra* note 75, at 756–60.

105. 17 U.S.C. §§ 101, 117 (2006).

106. See Karjala, *supra* note 103, at 77.

107. See 17 U.S.C. § 102(b). See generally Pamela Samuelson, *Why Copyright Excludes Systems and Processes from the Scope of Its Protection*, 85 TEX. L. REV. 1921 (2007) (discussing the history and meaning of § 102(b)).

108. 101 U.S. 99 (1879).

109. *Id.* at 102.

110. 17 U.S.C. § 101.

tually separable from the functional portion, copyright may extend to the former portion.¹¹¹ But where the two are inseparable, the entire item becomes anathema to copyright, and the entire work becomes ineligible for copyright protection.¹¹² Some argue that this rule has little application to software, as it seems directed to three-dimensional, prehensible types of artifacts.¹¹³ But in the age of data processing, it became clear that texts, too, could be functional in the mechanistic, operational sense of that term.¹¹⁴

If copyright is inimical to functional works, and software is clearly a functional work, then why place computer software within the ambit of copyright? Congress apparently viewed software as a kind of "literary work" comprised of symbolic indicia.¹¹⁵ And indeed programmers do "read" and "write" computer source code in "languages" that can be understood by other programmers.¹¹⁶ But to focus on source code is to see only half the story. Notwithstanding its amenability to instantiation as source code, software is unquestionably a utilitarian article, designed to execute the functions of a machine.¹¹⁷ Source code cannot be used by the machine; it is compiled or interpreted into machine-readable object code that the computer can execute.¹¹⁸ At the same time, source code is not merely a representation of the object code; it is an active text that affects the workings of a machine.¹¹⁹ It is itself, as some commentators have phrased it, a machine built of text.¹²⁰

Consequently, early litigants challenging copyright in computer software sought to limit the extent of copyright protection to the communicative versions of software texts—to

111. *Id.*; *Mazer v. Stein*, 347 U.S. 201, 218 (1954).

112. See 17 U.S.C. § 101 (stating that copyright protection only applies if the "pictorial, graphic, or sculptural features . . . can be identified separately from, and are capable of existing independently of, the utilitarian aspects of the article").

113. See Jane C. Ginsburg, *Four Reasons and a Paradox: The Manifest Superiority of Copyright over Sui Generis Protection of Computer Software*, 94 COLUM. L. REV. 2559, 2567-68 (1994) (arguing that the separation of an article's artistic elements from its utilitarian aspects is applicable to artwork, but not to computer programs).

114. See Samuelson et al., *supra* note 5, at 2316.

115. 17 U.S.C. § 101.

116. See PETZOLD, *supra* note 58, at 352-53.

117. See Samuelson, *supra* note 75, at 683.

118. See APPLEMAN, *supra* note 67, at 149.

119. See Samuelson, *supra* note 75, at 680-81.

120. See Samuelson et al., *supra* note 5, at 2320.

source code that was intended to be read by humans, or to applications that were intended to interact with humans.¹²¹ The argument was that copyright was traditionally intended to protect works that conveyed ideas or information to people: books, paintings, sculptures, maps, movies, sheet music.¹²² So if software were to be included within the copyright canon, it ought to be included only to the extent that it similarly communicated.¹²³ Source code might be said to communicate as a text, but machine-readable object code does not; it is part of the machine and purely functional.¹²⁴ Programs like word processors and spreadsheets also convey information to humans, but operating systems do not; they are purely part of the internal, unregarded function of the machine.¹²⁵ So perhaps a line could be drawn between communicative and functional software texts.¹²⁶

Unfortunately the line was not so pristine, and drawing it proved impossible as a policy matter. Most software is distributed to consumers as object code; source code is generally not commercially circulated.¹²⁷ Protecting source code while leaving object code unprotected would create the perverse situation where the machine-readable form of the program, which is the form typically distributed to consumers, would be vulnerable to copying, whereas the human-readable version, which is typically held proprietary, would be the protected version.¹²⁸ Consequently, courts quickly extended copyright protection to the object code form of programs, causing enormous mischief in an intellectual property system designed for expressive works.¹²⁹ After decades of litigation, software jurisprudence has settled

121. See, e.g., *Apple Computer, Inc. v. Franklin Computer Corp.*, 714 F.2d 1240, 1248 (3d Cir. 1983); *Williams Elecs., Inc. v. Artic Int'l, Inc.*, 685 F.2d 870, 876-77 (3d Cir. 1982); *Tandy Corp. v. Personal Micro Computers, Inc.*, 524 F. Supp. 171, 173 (N.D. Cal. 1981).

122. See *Apple Computer, Inc.*, 714 F.2d at 1249; *Williams Elecs.*, 685 F.2d at 876-77.

123. See *Apple Computer, Inc.*, 714 F.2d at 1248; *Williams Elecs.*, 685 F.2d at 876-77.

124. See Samuelson, *supra* note 75, at 683.

125. See *id.* at 678-79.

126. See *Apple Computer, Inc. v. Formula Int'l Inc.*, 725 F.2d 521, 523-24 (9th Cir. 1984).

127. Jessica Litman, *Copyright and Information Policy*, 55 LAW & CONTEMP. PROBS. 185, 196-97 (1992).

128. See Dan L. Burk, *Patenting Speech*, 79 TEX. L. REV. 99, 134 (2000).

129. See Dennis S. Karjala, *Copyright, Computer Software, and the New Protectionism*, 28 JURIMETRICS 33, 64-65, 76-77 (1987); Samuelson, *supra* note 75, at 668-69.

into an uneasy equilibrium where computer programs remain protected by copyright, but only minimally so; where exact copying of the code remains prohibited, but little protection is offered beyond that.¹³⁰

Following the lead of the Supreme Court in *Baker v. Selden*, the solution might seem to be to place software in the patent system.¹³¹ But I have argued in previous work that patent law faces the corollary and inverse problem to that of software in the copyright system.¹³² Patent law is explicitly directed to creations such as machines, processes, and materials that are utilitarian or functional in nature.¹³³ But due to the convergence of functional and communicative texts, patent law has inexorably begun to encompass nonfunctional subject matter, texts that it was not intended to cover and which it accommodates poorly.¹³⁴ Software is again the primary culprit: a text that functions as part of a machine is a utilitarian article, but one that can be communicative to humans due to its symbolic quality. In its machine-readable state, software seems most like patentable subject matter, but in its programming language representation it seems least like patentable subject matter.¹³⁵ Because symbolic representations are functional in a data-processing environment, they cannot be easily assigned to a subject-matter category.¹³⁶

But the difficulty for patent law is far more fundamental than the incorporation of symbolic source code into patentable subject matter. Because software is a text-based technology, it can encompass anything that can be described by human language.¹³⁷ This textual character opens the door to scripting

130. See Samuelson, *supra* note 75, at 754–55.

131. See Pamela Samuelson, *Benson Revisited: The Case Against Patent Protection for Algorithms and Other Computer Program-Related Inventions*, 39 EMORY L.J. 1025, 1142–47 (1990).

132. See Dan L. Burk, *Method and Madness in Copyright Law*, 2007 UTAH L. REV. 587, 608–11 [hereinafter Burk, *Method*]; Dan L. Burk, *The Problem of Process in Biotechnology*, 43 HOUS. L. REV. 561, 589–90 (2006) [hereinafter Burk, *Problem of Process*].

133. See 35 U.S.C. § 101 (2006) (defining patentable subject matter).

134. See Burk, *supra* note 128, at 136–41.

135. See Samuelson, *supra* note 131, at 1040–41.

136. See J.H. Reichman, *Charting the Collapse of the Patent-Copyright Dichotomy: Premises for a Restructured International Intellectual Property System*, 13 CARDOZO ARTS & ENT. L.J. 475, 507–08 (1995); Samuelson et al., *supra* note 5, at 2343–45.

137. See Phil Agre, *Internet Research: For and Against*, in 1 INTERNET RESEARCH ANNUAL: SELECTED PAPERS FROM THE ASSOCIATION OF INTERNET RE-

functions that encompass everything from aesthetic or communicative texts to textual machines that constitute music or images or other artistic works.¹³⁸ Indeed, digitized art, text, and music are now routinely stored and manipulated in precisely this fashion; the digital files that do so are not merely storage media, they may be executable computer code.¹³⁹ Thus ostensibly aesthetic works are potentially swept within the ambit of an intellectual property regime that was intended for functional works.¹⁴⁰

Additionally, accommodating software within patent law has required the distortion or abandonment of doctrines that once policed the line between communication and function.¹⁴¹ Patent law's printed matter doctrine long held that symbolic indicia could not be the subject of a patent; but this prohibition had to give way for software and other coded functional artifacts to receive patent protection.¹⁴² More salient to the discussion here is patent law's "mental steps" doctrine: patent law long held that inventions whose claims incorporated "mental steps" of calculation, estimation, or other cognitive functions were not legitimate subject matter for patents.¹⁴³ This prohibition included both a practical dimension—namely: how to enforce a patent that is infringed in the mind—as well as a theoretical dimension—is there not a First Amendment problem, let alone a general public policy problem, in patenting thought?¹⁴⁴

But the proliferation of data processing technologies rapidly compromised the viability of this subject-matter exclusion.¹⁴⁵ Processes and machines, including processes and machines for manipulating data, are ostensibly part of patentable subject matter. As I have detailed elsewhere, the inclusion of software

SEARCHERS CONFERENCES 2000–2002, at 25, 27 (Mia Consalvo et al. eds., 2004).

138. Burk, *supra* note 128, at 120–21.

139. See Anthony L. Clapes, *Confessions of an Amicus Curiae: Technophobia, Law, and Creativity in the Digital Arts*, 19 U. DAYTON L. REV. 903, 943 (1994).

140. See John R. Thomas, *The Patenting of the Liberal Professions*, 40 B.C. L. REV. 1139, 1163 (1999).

141. See Kevin Emerson Collins, *Propertizing Thought*, 60 SMU L. REV. 317, 351 (2007); Thomas, *supra* note 140, at 1160.

142. See Burk, *supra* note 128, at 141–45; Collins, *supra* note 141, at 351.

143. See Norman D. McClaskey, *The Mental Process Doctrine: Its Origin, Legal Basis, and Scope*, 55 IOWA L. REV. 1148, 1162–80 (1970).

144. See Thomas F. Cotter, *A Burkean Perspective on Patent Eligibility*, 22 BERKELEY TECH. L.J. 855, 879–82 (2007).

145. See Burk, *supra* note 128, at 143; Collins, *supra* note 141, at 351.

within patentable subject matter eroded the distinctions drawn under the mental steps doctrine; drafting claims that would read on silicon data processing without including carbon data processing proved an impossible semantic exercise.¹⁴⁶ Thus the mental steps doctrine has become primarily a historical curiosity in modern patent law, but the breakdown of that doctrine has returned to bedevil patent subject matter jurisprudence.¹⁴⁷

B. MIND AND MACHINE

The “mental steps” problem in patent law is a specific formulation of a now-generalized problem of intellectual property: how or whether to separate the workings of silicon memory devices from the analogous workings of carbon memory devices—that is to say, to separate computer data processing from the analogous workings of the brain.¹⁴⁸ It is present in copyright as well as patent law. When considering the nature of copying in copyright law, it is clear that people who read or view texts must be in some fashion “copying” them into human memory as they do so—humans who have viewed or read texts can visualize them, remember them, even reproduce them after the viewed text is removed from sight.¹⁴⁹ Computer devices also make temporary copies of such works in the course of processing or communicating them, and a number of courts have held that such copies in computer memory are unauthorized “copies” for purposes of copyright infringement.¹⁵⁰ But mental images have in contrast never been considered to constitute unauthorized copies of a work; reproducing a copyrighted work from memory into another tangible medium may

146. See Burk, *supra* note 128, at 100–01.

147. See *Lab. Corp. of Am. Holdings v. Metabolite Labs., Inc.*, 548 U.S. 124, 134–36 (2006) (Breyer, J., dissenting from dismissal). As of this writing, the Supreme Court has granted certiorari in *In re Bilski*, 545 F.3d 943 (Fed. Cir. 2008), *cert granted*, *Bilski v. Doll*, 129 S. Ct. 2735 (2009), which may well address some aspects of this issue.

148. Collins, *supra* note 141, at 344–45.

149. See *Bright Tunes Music Corp. v. Harrisongs Music, Ltd.*, 420 F. Supp. 177, 180–81 (S.D.N.Y. 1976) (holding that reproduction from memory, even inadvertently, may constitute infringement), *aff'd*, 722 F.2d 988 (2d Cir. 1983).

150. Compare *MAI Sys. Corp. v. Peak Computer, Inc.*, 991 F.2d 511, 517–18 (9th Cir. 1993) (holding that temporarily loading software into RAM constitutes fixation), and *Midway Mfg. Co. v. Artic Int'l, Inc.*, 704 F.2d 1009, 1012 (7th Cir. 1983) (holding that video game output was sufficiently fixed in the circuit board to permit copyright protection), with *NLFC, Inc. v. Devcom Mid-Am., Inc.*, 45 F.3d 231, 236 (7th Cir. 1995) (finding no fixation of software in a dedicated computer terminal).

be infringement, but the copy in the reader's gray matter is not itself an infringement.¹⁵¹

It should be clear that at a fundamental level the "cybermarks" problem in trademark law is yet another version of the "mental steps" problem. The logic of search is the logic of human cognition, embedded in data processing devices. The appellate court in *1-800 Contacts* came very close to articulating a trademark version of this mental steps consideration with its observation that "a company's internal utilization of a trademark in a way that does not communicate it to the public is analogous to an individual's private thoughts about a trademark."¹⁵² The precise question the court was considering was the unobserved use of a string of bits representing the trademark; like the early copyright software cases the question is couched in the context of "communication" to a human.¹⁵³ But the implication of the court's analogy is that mental correlation of a trademark, even if unauthorized, or to a product not issued by the trademark source, is unactionable.

While trademark shares with patent and copyright the problem of externalizing and propertizing "mental steps," the irony of trademark law is that the conceptual movement from silicon to carbon data processing is reversed. In patent and copyright, the doctrinal concern is to avoid extending intellectual property protection to thought or to mental steps; the difficulty is to include machine functions within the respective sets of intellectual property rights, while excluding analogous cognitive processes. By contrast, in trademark, the doctrinal concern is to avoid extending intellectual property protection to machine functions while protecting certain analogous cognitive processes: it is the association of mark and source in the mind of the consumer that is protected under trademark law, whereas the instantiation of such associations in an apparatus such as a card catalog or index ought not be protected.

In either case, drawing a line between analogous mental and mechanical functions is foregrounded by the advent of automated indexing systems. As I have suggested, the problem surely existed in previous index media, such as a card catalog.¹⁵⁴ In patent law, the problem was long apparent because

151. See Burk, *Method*, *supra* note 132, at 611.

152. *1-800 Contacts, Inc. v. WhenU.com, Inc.*, 414 F.3d 400, 409 (2d Cir. 2005).

153. See *supra* notes 42–49 and accompanying text.

154. See *supra* text accompanying notes 93–95.

the subject matter of patent explicitly includes processes, and processes implemented on paper and other physical media required the distinctions drawn in the written matter and mental steps doctrines.¹⁵⁵ In copyright the trouble became apparent more recently, when the separation between cognitive and mechanical functions could no longer be maintained as part of a distinction between utilitarian and expressive works.¹⁵⁶ The problem has lain latent for a good decade and half in trademark law, but the strings of code that I have called cybermarks embroil trademark law, too, in the same perplexity over information technologies.

C. COMMUNICATION AND FUNCTION

Neither has the problem of dividing expression from function been confined to intellectual property law; it has spilled over into other areas of what we might broadly term "information law." For example, the problem of distinguishing expression from function has similarly arisen in a series of lawsuits evaluating software under the speech and publication guarantees of the First Amendment.¹⁵⁷ In these lawsuits, computer science experts challenged federal software security restrictions that prevented export of software that included strong encryption algorithms.¹⁵⁸ Oddly, the government was willing to permit export of books or other print materials displaying such algorithms, but prohibited export of the identical computer programs.¹⁵⁹ The export restrictions were challenged on the theory that software constitutes a form of speech that is entitled to protection under the First Amendment: computer scientists

155. See *supra* notes 141–47 and accompanying text.

156. See Reichman, *supra* note 136, at 484–85; see also Rochelle Cooper Dreyfuss, *A Wiseguy's Approach to Information Products: Muscling Copyright and Patent into a Unitary Theory of Intellectual Property*, 1992 SUP. CT. REV. 195, 208–09.

157. See Robert Plotkin, *Fighting Keywords: Translating the First Amendment to Protect Software Speech*, 2003 U. ILL. J.L. TECH. & POL'Y 329, 329–31 & nn.5–10; Robert Post, *Encryption Source Code and the First Amendment*, 15 BERKELEY TECH. L.J. 713, 714 (2000); Lee Tien, *Publishing Software as a Speech Act*, 15 BERKELEY TECH L.J. 629, 678–79 (2000).

158. See *Junger v. Daley*, 209 F.3d 481, 484 (6th Cir. 2000); *Bernstein v. U.S. Dep't of Justice*, 176 F.3d 1132, 1135 (9th Cir. 1999); *Karn v. U.S. Dep't of State*, 925 F. Supp. 1, 3 (D.D.C. 1996); see also *Universal City Studios, Inc. v. Reimerdes*, 111 F. Supp. 2d 294, 327 (S.D.N.Y. 2000) (explaining Defendant's First Amendment challenge to anticircumvention provisions of the Digital Millennium Copyright Act).

159. *Junger*, 209 F.3d at 484; *Karn*, 925 F. Supp. at 3.

communicate ideas about computer programs in the form of computer code, and the plaintiffs in the cases sought the freedom to share encryption algorithm code with other computer scientists.¹⁶⁰

Courts reviewing the federal export restrictions concluded that computer code is both communicative and functional, and deserving of First Amendment protection, although at a level of scrutiny that would allow substantial governmental regulation.¹⁶¹ In attempting to discern whether software is functional or communicative, some courts engaged in this analysis looked to the expressive nature of copyright.¹⁶² This reasoning drew upon the inclusion of software within copyright to conclude that software, like other copyrightable subject matter, must be expressive for purposes of copyright, and so must likewise be expressive for First Amendment purposes.¹⁶³ The holdings of the software export cases were then subsequently relied on in copyright cases challenging intellectual property restrictions on the use and dissemination of software, bringing the expression discussion full circle.¹⁶⁴

At least a glimmering of this same distinction was identified by the courts in a dispute between Name.Space, Inc. and Network Solutions, the designated authority for administering Internet domain names.¹⁶⁵ Name.Space had sought to develop a set of new top-level domains, or TLDs, alternative to the familiar .com, .net, and related legacy TLDs.¹⁶⁶ Name.Space claimed antitrust and First Amendment violations when Network Solutions and its federal sponsor, the National Science Foundation, refused to recognize the new TLDs as part of the DNS technological infrastructure.¹⁶⁷ In particular, Name.Space asserted that the new domain names constituted a type of protected speech, and the failure of the government and its contractor to

160. See *Junger*, 209 F.3d at 483–84; *Bernstein v. U.S. Dep't of State*, 922 F. Supp. 1426, 1434 (N.D. Cal 1996).

161. *E.g.*, *Junger*, 209 F.3d at 484–85.

162. *E.g.*, *Bernstein*, 922 F. Supp. at 1436.

163. *Id.*

164. See, *e.g.*, *Universal City Studios, Inc. v. Corley*, 273 F.3d 429, 446 (2d Cir. 2001) (citing *Universal City Studios, Inc. v. Reimerdes*, 111 F. Supp. 2d 294, 326 (S.D.N.Y. 2000)).

165. *Name.Space, Inc. v. Network Solutions, Inc.*, 202 F.3d 573 (2d Cir. 2000).

166. *Id.* at 577, 579.

167. *Id.* at 579–80.

recognize the new domain names constituted a kind of illegitimate prior restraint.¹⁶⁸

At the district court level, the First Amendment question was analyzed as a choice between communication and functionality, under an analogy between domain names and telephone numbers.¹⁶⁹ The district court held that domain names were functional rather than communicative, a routing instruction for computers.¹⁷⁰ In reviewing the distinction drawn by the district court, the appellate court correctly noted that domain names are “not susceptible to such a uniform, monolithic characterization.”¹⁷¹ Much as had been decided in cases involving software export, the court reasoned that functionality does not necessarily make a string of symbols noncommunicative, or place it outside the ambit of the First Amendment.¹⁷² In reaching this conclusion, the court adopted a comparison to license plates or to telephone numbers, opining that although such symbolic indicia are functional, they can also be communicative, as in the case of “vanity” license plates or telephone numbers.¹⁷³

This analysis likely reaches the right conclusion, although not entirely by the correct route. The court’s analogy to license plates illustrates why we must be careful with the term “functional.” Injudicious use of the term can lead to confusion and analytical error. License plates are vehicle identifiers, and so are always communicative—that is their “function” in a broad sense of the term. But they are never functional in the sense that software or a useful artifact is functional; they are not physically operative; they do not “behave.” The purpose of a license plate is to communicate either the numerical identifier of a vehicle, or an incidental message that is layered on the string of identifying symbols, or both.¹⁷⁴ As the terminology of the copyright statute might put it, the “utility” of a license plate is to convey information or to portray itself.¹⁷⁵ But having a com-

168. *See id.* at 580, 584, 587.

169. *See id.* at 580 (citing *PGMedia, Inc. v. Network Solutions, Inc.*, 51 F. Supp. 2d 389, 390 (S.D.N.Y. 1999)); *cf.* *Burk*, *supra* note 12, ¶ 52 (discussing the analogy between domain names and alphanumeric telephone codes).

170. *See Name.Space*, 202 F.3d at 584.

171. *See id.* at 585.

172. *See id.*; *cf. supra* notes 157–61 and accompanying text (describing the software export cases).

173. *See Name.Space*, 202 F.3d at 585–86.

174. *See Wooley v. Maynard*, 430 U.S. 705, 716–17 (1977).

175. 17 U.S.C. § 101 (2006) (“A ‘useful article’ is an article having an intrinsic utilitarian function that is not merely to portray the appearance of the

municative use or function does not make a license plate functional in the relevant sense of that term.

The unrecognized distinction between the Court's two examples suggests that it may be desirable to distinguish between "communicative" symbols and "expressive" symbols, at least for First Amendment purposes.¹⁷⁶ The court's opinion suggests that it conflated communication with functionality. As identifiers, license plates are clearly communicative, although not necessarily expressive in the senses contemplated by the First Amendment; the plates do not have a particularized message but merely designate a particular vehicle. Vanity plates will tend to be communicative as well as expressive in the First Amendment sense, conveying not only vehicle identity, but also a particularized message.¹⁷⁷ We might add that neither type of plate is likely to be expressive in the copyright sense of the term; the strings of symbols are probably not original works of authorship.¹⁷⁸ But certainly neither type of plate is functional in an operational sense.

The court's comparison to telephone numbers, however, seems better considered, as telephone numbers come closer to incorporating both the functional and communicative aspects the court was attempting to illustrate. Telephone numbers are logical representations of the telephone switching system, indicating either a location or the name of a device on the telephone network.¹⁷⁹ Although they are somewhat arbitrary in that other symbols might have been adopted to indicate names and locations, telephone numbers instantiate and initiate the physical operation of the system. They may, as the court suggested, have layered on top of them some communicative message or association.¹⁸⁰ Much of this communication will be due to the association of the numbers with letters on the telephone keypad, or due to the association certain numbers have in other

article or to convey information.").

176. Cf. *Burk*, *supra* note 128, at 126 (noting that "expression" for copyright purposes may not necessarily be "expression" for First Amendment purposes).

177. See *Wooley*, 430 U.S. at 705; *Roach v. Stouffer*, 560 F.3d 860, 864 (8th Cir. 2009); *Sons of Confederate Veterans, Inc. v. Comm'r of Va. Dep't of Motor Vehicles*, 288 F.3d 610, 614 (4th Cir. 2002).

178. See, e.g., *Feist Publ'ns Inc. v. Rural Tel. Serv. Co.*, 499 U.S. 340, 363-64 (1991) (holding telephone numbers are unoriginal factual data).

179. See *Burk*, *supra* note 12, ¶ 32.

180. See *Name.Space, Inc. v. Network Solutions, Inc.*, 202 F.3d 573, 584-84 (2d Cir. 2000).

contexts.¹⁸¹ In other words, it is the translation of human cognitive associations onto a functional device that gives rise to the same set of concerns, whether on telephones or in search engines, and whether characterized as a matter of First Amendment, copyright, patent, or trademark law.

IV. FUNCTIONALITY DOCTRINE

Discussion of functionality issues in patent and in copyright and even the jurisprudence of the First Amendment, brings us to a discussion of the functionality doctrine in trademark law. Black-letter trademark law specifies that functional articles are not protectable as trademarks.¹⁸² The partition of subject matter between trademark and patent is perhaps even more explicit in trademark doctrine than the partition between patent and copyright in *Baker v. Selden*.¹⁸³ If cybermarks are indeed functional strings of computer code, functionality doctrine should have something to say about their treatment as trademarks; specifically, it likely says that they are precluded from receiving trademark protection.

A. DEFINITIONAL CAUTIONS

In considering trademark functionality doctrine, we must take some care with our definitions. As we have seen, the *Name.Space* opinion underscores the need to separate communication, expression, and function.¹⁸⁴ In copyright, the definitional problem has presented itself in terms of “utility” or “useful articles,” which are purportedly outside the ambit of copyright.¹⁸⁵ But works that are clearly within copyright are also clearly “useful” in some sense of that term: books are useful for recording and communicating information, paintings are useful for hanging on walls, and so on.¹⁸⁶ So the distinction we have been considering has been couched by some commentators in terms of function: software functions in an operational sense, whereas paintings and poetry do not.¹⁸⁷

181. See Burk, *supra* note 12, ¶ 57.

182. 15 U.S.C. § 1052(e)(5) (2006); *Qualitex Co. v. Jacobson Prods. Co.*, 514 U.S. 159, 164–65 (1995).

183. 101 U.S. 99 (1879).

184. See *supra* text accompanying notes 176–78.

185. See *supra* notes 173–75 and accompanying text.

186. Dan L. Burk, *Expression, Selection, Abstraction: Copyright's Golden Braid*, 55 SYRACUSE L. REV. 593, 601 (2005).

187. See Karjala, *supra* note 103, at 57–58.

Similarly, when it comes to trademark functionality, we must not equate function with purpose or use in the broad sense; in this sense, all trademarks have a function—to assist consumers in identifying the source of goods or services in commerce. Trademark law cannot exclude marks that are functional in this broad sense or it would eviscerate itself. Neither can we afford to confuse communication with utilitarian function, as occurs, for example, in the McCarthy trademark treatise, where the author describes phrases such as “Shake Before Using” and “Open Here” as functional.¹⁸⁸ Such phrases are communicative, but they do not “behave” in the same fashion as a product configuration.¹⁸⁹ Rather, what we are concerned with in functionality are items that are functional in what McCarthy terms the “engineering-type” or mechanical sense,¹⁹⁰ items with operational characteristics other than to communicate the source of a product or service.

B. FUNCTIONALITY RATIONALES

Defining functionality in trademark law has been no easier than it has been in other areas of intellectual property. Attempts to characterize the indicia for trademark functionality have a history as long as the doctrine itself, which extends well back into the late nineteenth and early twentieth centuries.¹⁹¹ The iconic, germinal case remains the Supreme Court decision in *Kellog Co. v. National Biscuit Co.*¹⁹² The developer of the cereal, whose interests had been acquired by the National Biscuit Company (Nabisco),¹⁹³ had held utility patents on the product and production method for “pillow shaped” biscuits of shredded wheat breakfast cereal.¹⁹⁴ After the expiration of the patents, when competitor Kellogg began producing similar breakfast cereal biscuits,¹⁹⁵ Nabisco sued for trademark infringement, arguing that during the period of patent exclusivity the public

188. 1 MCCARTHY, *supra* note 50, § 7:83.

189. See Samuelson et al., *supra* note 5, at 2317–18.

190. 1 MCCARTHY, *supra* note 50, § 7:64.

191. See, e.g., *Singer Mfg. Co. v. June Mfg. Co.*, 163 U.S. 169 (1896).

192. 305 U.S. 111 (1938). For a detailed background on the case, see Graeme B. Dinwoodie, *The Story of Kellog Co. v. National Biscuit Co.: Breakfast with Brandeis*, in *INTELLECTUAL PROPERTY STORIES* 220, 221–26 (Jane C. Ginsburg & Rochelle Cooper Dreyfuss eds., 2006).

193. *Kellog Co.*, 305 U.S. at 113–14.

194. *Id.* at 117.

195. See *id.* at 114.

had come to associate the shape of the cereal with its source.¹⁹⁶ Despite the fact that the biscuit shape might well have achieved secondary meaning, the Supreme Court rejected the trademark claim as an illegitimate attempt to extend the life of the exclusive rights in the patent.¹⁹⁷ One of the fundamental policies underlying the patent system is that patented inventions are intended to become available to the public after a defined period of exclusivity.¹⁹⁸ But, because trademark protection is effectively perpetual so long as the mark remains in use, the *Kellog Co.* Court reasoned that allowing trademark claims in the patented item would frustrate the policy of the patent system.¹⁹⁹

Over time, this reasoning from the *Kellog* case became a mainstay of functionality doctrine: the existence of a utility patent on a given product configuration renders that configuration ineligible for trademark protection.²⁰⁰ A utility patent, particularly an expired utility patent directed to the subject matter of the mark, is persuasive and, perhaps, conclusive evidence of functionality.²⁰¹ In some cases, the rationale for this result may be the Supremacy Clause preemption of state trademark law by the policy underlying the federal patent statute—to prevent a sort of “evergreening” of patentable inventions.²⁰² In other cases, it may be the constitutional override of federal or state trademark law by the Patent and Copyright Clause in Article I.²⁰³ At a minimum, the existence of a utility patent is taken as strong evidence of functionality, either because an expert federal agency—the United States Patent and Trademark Office (USPTO)—has deemed the configuration functional in issuing a patent on it,²⁰⁴ or due to a kind of estoppel, in that the owner of the patent on the configuration has previously represented to

196. *See id.* at 118.

197. *Id.* at 117–18.

198. *See* *Brulotte v. Thys Co.*, 379 U.S. 29, 31 (1964).

199. *See Kellog Co.*, 305 U.S. at 120 (quoting *Singer Mfg. Co. v. June Mfg. Co.*, 163 U.S. 169, 185 (1896)).

200. *See* *Dinwoodie*, *supra* note 192, at 220.

201. *See* 1 MCCARTHY, *supra* note 50, § 7:89 (quoting *Traffix Devices, Inc. v. Mktg. Displays, Inc.*, 532 U.S. 23, 29 (2001)).

202. *See id.* § 7:64.

203. *See* *I.P. Lund Trading ApS v. Kohler Co.*, 163 F.3d 27, 52–53 (1st Cir. 1998).

204. *Traffix Devices*, 532 U.S. at 29.

the USPTO and to the world that the configuration is functional, by virtue of having pursued a patent for it.²⁰⁵

A second mainstay of functionality doctrine with roots in the *Kellog Co.* case is the rationale of competitive need. This rationale holds that if access to a given configuration is necessary to compete in the marketplace, that configuration must be functional and so unavailable for trademark protection.²⁰⁶ Courts traditionally measured the competitive need by asking whether the configuration in question was the sole configuration, or one of very few available, to compete in a given market; if so, then trademark status would confer an improper monopoly on a needed configuration or structure.²⁰⁷ This test paralleled in some sense the merger doctrine familiar in copyright: because copyright does not protect ideas, but only expression, if there is only one way, or a very small number of alternative ways, of expressing an idea, then granting a copyright would be improper because it would effectively protect the idea.²⁰⁸ In such cases idea and expression are said to have “merged” and the policy of excluding ideas from copyright becomes paramount.²⁰⁹ One might similarly think about trademarks and functionality “merging,” in which case the policy against protecting functional configurations becomes paramount.

However, as it has been in copyright, this formulation of trademark competitive necessity has proven problematic. In copyright, it is clear that a sufficiently clever adjudicator can always find alternatives to a given expression—although not necessarily very good alternatives. “See Spot run” might alternatively be expressed “Observe Spot perambulate,” even though the latter hardly seems equivalent to the former in terms of clarity, simplicity, and concision.²¹⁰ If the mere presence of alternatives obviated copyright merger, there would never be any findings of copyright merger. So, too, in trademarks, courts could nearly always find some alternative configuration, although perhaps not especially good alternative configurations, so that if the mere presence of alternatives

205. *Id.* at 31.

206. *See Qualitex Co. v. Jacobson Prods. Co.*, 514 U.S. 159, 169 (1995).

207. *See* 1 MCCARTHY, *supra* note 50, § 7:65.

208. *See Morrissey v. Proctor & Gamble Co.*, 379 F.2d 675, 678–79 (1st Cir. 1967).

209. *See id.*

210. *See Burk, supra* note 186, at 603.

obviated functionality, there would never be any findings of functionality.

But this approach was largely repudiated in the Supreme Court's more recent *TrafFix Devices* opinion.²¹¹ That case concerned the distinctive three-dimensional configuration of springs on traffic signage, springs that were intended to hold the sign upright in the wind.²¹² The springs had become identified with the initial manufacturer of such signs, but were also clearly functional, and the subject of an expired utility patent.²¹³ In a trade dress suit against a competitor that had manufactured signs with similar springs, the Supreme Court both reaffirmed the viability of functionality doctrine²¹⁴ and laid the competitive alternative doctrine to rest, at least as a definitive test for eliminating functionality.²¹⁵ The Court held that the presence or absence of alternatives is not determinative of functionality: at best it is an indicator as to functionality.²¹⁶ The Court instead emphasized the "engineering" indicia of functionality.²¹⁷ Alternatives or not, functionality hinges on whether the item in question is utilitarian in a mechanical or operational sense, and that is determined by considering the use, purpose, or cost of the alleged source indicator, rather than by considering possible alternatives.²¹⁸

Cybermarks seem good candidates for functionality under such an approach. Even under the "alternatives" approach, it is difficult to see what practical alternatives exist to using trademarks as components of an index to related information. Under the *TrafFix Devices* approach, we have seen that the use or purpose of the character string is functional in a mechanical or operational sense. As other circuit courts have formulated the test, we might say that the employment of trademarks as the human-readable interface in search technology seems to be a "feature 'dictated by the functions to be performed.'"²¹⁹ Similar-

211. See *TrafFix Devices, Inc. v. Mktg. Displays, Inc.*, 532 U.S. 23, 33-34 (2001).

212. *Id.* at 25.

213. See *id.* at 34-35.

214. See *id.* at 30.

215. See *id.* at 34-35.

216. See *id.*

217. See *id.* at 31-32.

218. See *id.*

219. *Brandir Int'l, Inc. v. Cascade Pac. Lumber Co.*, 834 F.2d 1142, 1148 (2d Cir. 1987) (quoting *Warner Bros., Inc. v. Gay Toys, Inc.*, 724 F.2d 327, 331 (2d Cir. 1983)).

ly, trademark keywords seem to be “essential to the use or purpose”²²⁰ of search technologies. The inability to employ trademarks in this fashion would create significant nonreputational disadvantages²²¹ for search technologies. Indeed, it is difficult to imagine how they might be constructed in any other way.

V. SOME OBJECTIONS

While the controversies over function and expression in other areas of intellectual property point the way to framing the cybermark issue in trademark law, the history of those parallel discussions is admittedly not especially encouraging for such an approach. The question of software copyright has reached an uneasy state of détente only after decades of controversy, and the status of expressive works within patent law remains contested. I frankly expect that courts will be skeptical of a functionality analysis, and certainly trademark holders will resist this approach. But on the remote chance that trademark law might embrace a measure of reason that has eluded other areas of intellectual property, I consider a few of the likely objections to this approach.

A. WORDS AND CONFIGURATIONS

One objection to employing the functionality doctrine in the context of cybermarks is that these are by and large word marks, and functionality doctrine has never been applied to word marks. Functionality has tended to apply to product configurations, the design of traffic sign springs,²²² or the shape of a breakfast cereal biscuit.²²³ As a matter of history and application, functionality doctrine has belonged to the tangible and prehensible. The underlying assumption in this association seems to be that artifacts that can be instantiated in three dimensions may be functional, as well as sometimes communicative,²²⁴ whereas words or symbols are always communicative rather than functional. The exception to this limitation may be the controversial doctrine of aesthetic functionality, holding that marks may be “functional” if they are attractive or appeal-

220. *Inwood Labs., Inc. v. Ives Labs., Inc.*, 456 U.S. 844, 850 n.10 (1982).

221. *See Qualitex Co. v. Jacobson Prods. Co.*, 514 U.S. 159, 174 (1995).

222. *See supra* notes 211–18 and accompanying text.

223. *See supra* notes 192–99 and accompanying text.

224. *Cf. Graeme B. Dinwoodie, The Death of Ontology: A Teleological Approach to Trademark Law*, 84 IOWA L. REV. 611, 624 (1999) (arguing that product designs regularly convey meaning to consumers).

ing—which is of course controversial precisely because it contemplates a different meaning of functionality, incorporating into its scope cognitive or cultural “functions” rather than purely physical operations.²²⁵

But my assertion here is that cybermarks, despite being symbolic indicia, are functional in the core sense of that term contemplated in trademark functionality, and not in the sense of entailing aesthetic or cognitive appeal. As our review above of utilitarian works in the copyright context has shown, symbolic indicia in a data processing environment are indeed functional in the sense of mediating physical operations and producing physical results.²²⁶ In this sense, my thesis is to some extent the inverse of Professor Dinwoodie’s observation that prehensible objects convey meaning and deserve treatment as trademarks;²²⁷ I contend that in a data processing environment, symbolic indicia become functional and so may not deserve treatment as trademarks. It may be true that functionality has seldom been applied to word marks, but that is because in the world of atoms, words do not “behave” functionally. But in the world of bits they do, and functionality doctrine is fully capable of encompassing functional words.

And although functionality doctrine has largely been applied to prehensible, three-dimensional product configurations, there have been exceptions, even in the world of atoms. A few cases have found two-dimensional marks to be functional. For example, the Trademark Office denied registration to a configuration of marks on an answer sheet for test scoring—the marks were intended to be optically scanned and so were deemed functional.²²⁸ Similarly, trademark registration was denied to a set of video game character configurations that were dictated by the technical constraints of the display device;²²⁹ because the shapes were prescribed as a matter of engineering, they were deemed functional.²³⁰

Certainly the configuration of the optical scanning codes could become associated with the source of the answer sheets,

225. See 1 MCCARTHY, *supra* note 50, § 7:79.

226. See *supra* Part III.A.

227. See Dinwoodie, *supra* note 192, at 216.

228. Moore Bus. Forms, Inc. v. Nat’l Computer Sys., Inc., 211 U.S.P.Q. (BNA) 900, 916 (T.T.A.B. 1981).

229. Atari, Inc. v. Mattel, Inc., 217 U.S.P.Q. (BNA) 816, 819 (T.T.A.B. 1982).

230. See *id.*

but like the bar code labeling example I have mentioned previously, they are clearly a component of an information storage and retrieval system,²³¹ and are, therefore, functional. The Trademark Board properly recognized this fact in denying the code patterns trademark registration.²³² Keyword search terms are in a similar fashion components of an information storage and retrieval system: patterns that trigger certain responses in the system to display associated data. The alphabetic patterns of these components may be recognized by consumers—even readily recognized by consumers—as also forming word marks associated with a source of goods. But like an optical scanning answer key or UPC bar code, their function in the context of the search engine is to trigger certain electromechanical responses. Functionality doctrine is appropriate in both cases.

B. CONTEXT

A second concern regarding functionality might be its binary “either-or” quality. The trademark utility jurisprudence has tended to treat functionality as immutable and inherent; functional objects are functional in all times and all places.²³³ When an item is deemed functional it is categorically placed outside the subject matter of trademark law.²³⁴ But functionality, in the sense of mechanical or physical operation, is necessarily context-specific, as analysis of the analogous question in other areas of intellectual property has shown. In copyright law this problem presents itself as the paradox of Duchamp’s urinal.²³⁵ In the men’s restroom, a urinal is surely a utilitarian device, functioning as a component of the plumbing. But if the urinal is relocated into a museum or gallery as an object of “found” art, as Duchamp did,²³⁶ it no longer performs this lavatory function. Divorced from the pipes, valves, spigots, and waterworks of the restroom, the ceramic fixture transitions from waste disposal mechanism to a cultural artifact. If the artifact’s label shifts from “urinal” to “fountain,” and its classification shifts from commode to sculpture, does it become an expressive

231. See *Moore*, 211 U.S.P.Q. (BNA) at 916.

232. See *id.* at 916–17.

233. Cf. *TraFFix Devices, Inc. v. Mktg. Displays, Inc.*, 532 U.S. 23, 31–32 (2001) (describing factors for determining functionality).

234. See *id.* at 30.

235. See Jeffrey Malkan, *What Is a Copy?*, 23 CARDOZO ARTS & ENT. L.J. 419, 436 (2005).

236. *Id.* at 437.

work? And, more importantly, if it is now expressive, could it be the subject matter of copyright?

In a similar vein, consider the traffic sign springs from the *TrafFix Devices* case.²³⁷ Attached to a traffic sign, they are clearly functional; they serve to hold the sign upright while maintaining a degree of flexibility when the flat sign panel is buffeted by the wind. Under the trademark analysis in the Supreme Court's opinion, this functionality renders the spring configuration ineligible for trademark status, even if that configuration has gained secondary meaning.²³⁸ But is the distinctive spring configuration truly functional in all contexts? Imagine the springs removed from the traffic sign and displayed on the cab of the company's service trucks; or imagine them depicted as a hologram in the company logo. The springs in such contexts continue to serve a communicative function, indicating to consumers the source of goods or services, but they no longer perform the mechanical function of flexibly supporting traffic signs. Outside the context of traffic sign support, there seems no reason that the springs could not serve purely as trademarks.

This analysis suggests that "functionality" must be context-dependent, rather than immutable. Context dependence applies not only to prehensible product designs, such as the shape of traffic sign springs. Symbolic indicia, such as words, may be functional in the context of data processing or indexing systems, but communicative in the context of letterhead, billboards, product labels, or television advertisements. The fact that the alphabetic string "Coca-Cola" in a metatag or Google search field is functioning as an indexing and search code does not preclude it from serving as an indicator of source on a soft drink can, and vice versa. Taking such context into account would require a slight reorientation of functionality jurisprudence, but the change is both sensible and coherent with current law.

C. TRADEMARK USE

This leads to a third consideration involving the question of "trademark use," which has become a flashpoint for discussion

237. See *supra* notes 211–13 and accompanying text.

238. *TrafFix Devices*, 532 U.S. at 33.

of cybermarks.²³⁹ Courts have held under a variety of factual settings that a mark which is not being used as a trademark is not entitled to protection as a trademark.²⁴⁰ In some cases this has been the theory for disposing of the Internet keyword cases I consider here.²⁴¹ Thus, some of the cases mentioned above, regarding pop-up advertisements or keyword searching, have held that cybermarks that are being used to trigger pop-up advertisements, or that are being used as search terms, are not being used as trademarks, and so receive no trademark protection.

Certainly the problem that I have identified under the rubric of functionality is closely related to the problem of trademark use. Courts appear to be skirting the edges of the functionality approach in holding in some cases that uses of a trademark that are “internal” to Internet operations escape liability for infringement.²⁴² The cases holding that no “trademark use” occurs when a trademark is employed as part of an index or data set that is “internal” to a software application imply that if the term is unobserved by consumers, it cannot be serving as a trademark.²⁴³ This rationale is correct, so far as it goes. These cases recognize that a symbol may operate as a trademark in some instances, and yet operate as a symbol of something other than product source in other instances.²⁴⁴ If the mark in question is employed as a symbol for something other than source identification, then the requirements of use as a trademark are not met and there can be no claim under trademark law.²⁴⁵

239. See Margreth Barrett, *Internet Trademark Suits and the Demise of “Trademark Use,”* 39 U.C. DAVIS L. REV. 371, 371 (2006); Lastowka, *supra* note 91, at 1394.

240. See, e.g., *Avery Dennison Corp. v. Sumpton*, 189 F.3d 868, 880 (9th Cir. 1999).

241. See, e.g., *S&L Vitamins, Inc. v. Austl. Gold, Inc.*, 521 F. Supp. 2d 188, 201–02 (E.D.N.Y. 2007).

242. See, e.g., *id.* at 199; *Rescuecom Corp. v. Google Inc.*, 456 F. Supp. 2d 393, 400–01 (N.D.N.Y. 2006), *vacated*, 562 F.3d 123, 131 (2d Cir. 2009); *Merck & Co., Inc. v. Mediplan Health Consulting, Inc.*, 425 F. Supp. 2d 402, 415 (S.D.N.Y. 2006); *U-Haul Int’l, Inc. v. WhenU.com, Inc.*, 279 F. Supp. 2d 723, 728 (E.D. Va. 2003).

243. See, e.g., *Wells Fargo & Co. v. WhenU.com, Inc.*, 293 F. Supp. 2d 734, 762 (E.D. Mich. 2003); *U-Haul Int’l, Inc.*, 279 F. Supp. 2d at 728.

244. See, e.g., *Wells Fargo & Co.*, 293 F. Supp. 2d at 762.

245. See, e.g., *Bird v. Parsons*, 289 F.3d 865, 878 (6th Cir. 2002); *Lockheed Martin Corp. v. Network Solutions, Inc.*, 985 F. Supp. 949, 957–58 (C.D. Cal. 1997).

One might go a step further, taking my argument into account, and say that trademarks that are functioning as code are not being used as trademarks, and so the trademark use doctrine could address the cybermark problem. But by focusing on “use” rather than on functionality, a rather muddled jurisprudence on trademark use has emerged.²⁴⁶ This approach has also been the focus of considerable recent commentary, with some analysts arguing that the doctrine is illegitimate because it was not clearly historically articulated,²⁴⁷ and others arguing that the doctrine is merely a crystallization of principles long extant in trademark jurisprudence.²⁴⁸

I confess that I find the functionality approach preferable, in part because it foregrounds the commonalities with copyright and patent that I have identified, and in larger part because it sidesteps the discussion about trademark use. Setting aside the murkiness of the emerging trademark use doctrine itself, and the merits of its pedigree, it should be clear that in many cases cybermarks have dual communicative and functional roles. But functionality doctrine is indifferent as to whether a product configuration, whether two-dimensional or three-dimensional, is being “used” as a trademark.²⁴⁹ It may well be that the shape of the breakfast cereal,²⁵⁰ or of the traffic sign,²⁵¹ or of the optical scanning code²⁵² is being used as an indicator of source. But those configurations are also functional, and so their use as an indicator of source is beside the point; they cannot be protected as trademarks.

CONCLUSION

I conclude by addressing a final, instrumental objection to my analysis: that treating cybermarks as the functional strings of code that they are would leave trademark holders vulnerable to the depredations of rogue search providers. The rogue search provider that intentionally designs its search algorithms or ad-

246. See McGeveran, *supra* note 101, at 49; Mark P. McKenna, *Trademark Use and the Problem of Source*, 2009 U. ILL. L. REV. 773, 773.

247. See Graeme B. Dinwoodie & Mark D. Janis, *Confusion Over Use: Contextualism in Trademark Law*, 92 IOWA L. REV. 1597, 1600–06 (2007).

248. See Dogan & Lemley, *supra* note 99, at 1686–87.

249. See *TraFFix Devices, Inc. v. Mktg. Displays, Inc.*, 532 U.S. 23, 31–32 (2001).

250. *Kellog Co. v. Nat'l Biscuit Co.*, 305 U.S. 111, 117 (1938).

251. *TraFFix Devices*, 532 U.S. at 25.

252. *Moore Bus. Forms, Inc. v. Nat'l Computer Sys., Inc.*, 211 U.S.P.Q. (BNA) 909, 910 (T.T.A.B. 1981).

vertising services to deliver results that deceive consumers has apparently haunted the fears of certain commentators.²⁵³ Certainly it was a concern of the Second Circuit panel that decided the *Rescuecom* case, and that court's rejection of the trademark use doctrine appeared to hinge on such fears.²⁵⁴

This does not seem to me a plausible concern, nor, for that matter, a relevant one. The worry that search providers will engage in such behavior assumes myriad fanciful facts not in evidence. Stacey Dogan seems close to the mark in observing that this concern is likely a thinly veiled form of hysteria regarding the dominance of Google as a search provider.²⁵⁵ But that is a problem, if it is a problem at all, for antitrust law, not trademark law. Some concern over Google's current primacy in the technology of search is perhaps understandable, but it hardly seems a reason to embrace a regime that gives trademark holders a veto in the development of technologies implementing the logic of search. Eric Goldman has plausibly argued that a search service that delivers results about "Coca-Cola" when consumers are seeking Adidas, or vice versa, is not long for this world.²⁵⁶ To the extent that Goldman is wrong, and market failures might allow the rogue search provider to survive, or even thrive, a variety of regulatory and legal correctives are available outside of trademark law.²⁵⁷ It seems less likely that the public interest in the development of cybermarks can be aligned with the business interests of a given trademark holder than that it can be aligned with the business interest of search providers.

253. See Grimmelmann, *supra* note 23, at 61–62; Lastowka, *supra* note 91, at 1396–97.

254. *Rescuecom Corp. v. Google Inc.*, 562 F.3d 123, 130–31 (2d Cir. 2009).

255. Stacey L. Dogan, *Beyond Trademark Use*, 8 J. TELECOMM. & HIGH TECH. L. 135, 137 (2010).

256. See Eric Goldman, *Search Engine Bias and the Demise of Search Engine Utopianism*, 8 YALE J.L. & TECH. 188, 198–99 (2006).

257. See, e.g., Alex W. Cannon, *Regulating Adwords: Consumer Protection in a Market Where the Commodity Is Speech*, 39 SETON HALL L. REV. 291, 331–32 (2009) (advocating FTC oversight of misleading search engine practices); Andrew Sinclair, Note, *Regulation of Paid Listings in Internet Search Engines: A Proposal for FTC Action*, 10 B.U. J. SCI. & TECH. L. 353, 378 (2004) (same); see also Oren Bracha & Frank Pasquale, *Federal Search Commission? Access, Fairness, and Accountability in the Law of Search*, 93 CORNELL L. REV. 1149, 1206–09 (2008). While I think the FTC is well-suited to protect consumers from intentional advertising deception, I confess that I am skeptical of both the utility and the practicality of the Bracha/Pasquale proposal to engage some type of index police to vet the algorithms of search providers.