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Functionality and Graphical User Interface Design Patents

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FUNCTIONALITY AND GRAPHICAL USER INTERFACE DESIGN PATENTS

FORTHCOMING, STANFORD TECH. L. REV.

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INTRODUCTION

Modern designers of graphical user interfaces, or GUIs, have obtained design patent protection for creative computer software displays, a realm previously limited to copyright. The difference in protection is important. Design patents do not require copying, while copyright does. Design patents do not have a fair use defense, while copyright does. Design patents do not exclude protection of ideas, while copyright does. Finally, design patents do not apportion damages to the infringing component, while copyright does.

Thus, a trend toward patenting is unsurprising. However, design patents for GUIs present some legal difficulties. Design patents should protect ornamental designs only, but user interfaces incorporate significant functional elements.[1] First, functionality might include the "idea" of the invention; a design may be functional because it is so broadly construed that it covers any design implementing the same idea. Second, functionality might typically include the operation of the GUI; this is probably what most people think of as functional. Third, functionality might include customer expectations, ease of use, and ergonomics; this category is somewhat scientific, despite the fact that many armchair observers have opinions about what works in design and what doesn't.

To be sure, GUIs include creative design elements as well, but there is no clear dividing line between creativity and functionality in the current case law. Indeed, few courts or commentators have specifically weighed in on how design patents should apply to the mélange of functional and

[1] Reyes Juárez-Ramírez, *et al., Towards Improving User Interfaces: A Proposal for Integrating Functionality and Usability Since Early Phases*, 2011 vol. 1 INT'L CONF. ON UNCERTAINTY REASONING AND KNOWLEDGE ENGINEERING 119, 119-121 (2011) (describing method of integrating usability design and program functionality of user interface). As discussed in more detail below, determining what is ornamental is harder than it sounds.

ornamental features of GUIs. How should animations, such as a spinning cursor or a simulated page turn be treated? What about the overall design of the user screen? These questions, and more, have received little attention to date. Those few non-GUI cases attempting to separate functionality from ornamentality appear to rely on gut feelings more than analytical dissection. In many cases, courts leave the determination up to the jury with little guidance.

These issues came to a head in the recent case of Apple v. Samsung. In that case, Apple sued Samsung for infringing –willfully, in fact—one of its design patents. The jury found infringement by several Samsung phones, and awarded hundreds of millions of dollars based on such infringement. The following figure is a side-by-side comparison of Samsung's screen with Apple's patent.

The screens are not identical, but that's not the standard. Instead, the standard is whether the ordinary observer would believe that the screen on the left is the same as the patented design. The jury decided: "Yes" and the District Court allowed the ruling to stand. In doing so, the Court explicitly ruled that it need not (indeed *should not*) instruct the jury about which functional aspects to include, disregard, or even consider. Though it was told it could disregard elements if it wanted, the jury was left to decide as it saw fit.

For design patent neophytes, this comparison and the jury's verdict usually leads to three questions that this article seeks to answer:

1. Isn't this something that should just be copyrighted? Why should there be a patent? The answer is relatively simple: the law has, since 1870,

contemplated dual protection. I trace the history to explain why the law could have evolved differently, but simply did not.

2. Both of these screens change, both before and after sale. How can someone patent an ephemeral screen design? It also turns out that ephemeral designs have been protected for some time. Even so, I propose some limitations on the protection of GUIs that should address the special nature of GUI design patents.

3. There are so many differences between these images. How can Apple patent the idea of square icons in a grid with a dock bar at the bottom? More intractable is determining when a design is infringing, and the role that functionality should play in that consideration. The bulk of this article is dedicated to answering this question.

Examination of economic principles may help guide courts in deciding when a GUI is ornamental or not and how that fact should affect infringement determinations. These same economic principles applied to copyright disputes of the 1980's and 1990's, many of which were bitterly fought but now seem relatively well-settled. Nascent GUI designers used copyright law to protect the creative aspects of their designs. They did so with varying levels of success; some cases extended protection while some did not in seemingly opposed opinions. In prior work,[2] I identified the principles underlying seemingly contradictory outcomes. Those principles helped settle the field—even if no one knew it was happening. Indeed, GUI copyright cases died off over time and are relatively rare today.

The economic analysis begins with two propositions.

First, courts are the gatekeepers to the proper level of copyright protection. As such, they maximize social value, but based on the facts before them, rather than attempting to maximize welfare *ex ante* with a veil of ignorance as to facts on the ground.

Second, this intermediate, or delayed ex ante, optimization led to factors that considered the relationship of the parties and the importance of the *particular* software before the court, in addition to general encouragement of innovation by the parties and other software designers. This maintains dynamic efficiency, but uses more information as an input.

Thus, courts should be—and are—more likely to find infringement in cases of market substitution, slavish copying, or breach of an economic relationship.

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[2] I reconciled these decisions in a previous article. Michael Risch, *How Can* Whelan v. Jaslow *and* Lotus v. Borland *Both be Right? Re-Examining the Economics of Computer Software Reuse*, 17 JOHN MARSHALL J. COMP. & INFO. Law 511 (1999).

Also, courts should be—and are—less likely to find infringement or less likely to extend protections where customers benefit from compatibility. For example, where switching costs are high, either due to hardware costs or user training, courts will be more willing to allow reuse. Similarly, where the design becomes a de facto standard, courts may be more likely to allow others to use it.

Further, courts should be—and are—less likely to extend protection where competitive principles favor compatibility. Courts will allow software that provides network connectivity or an application programming interface that allows software programs to exchange data.

These three factors—substitution, customer needs, and competitive needs—explain virtually all, if not all, judicial copyright decisions relating to software reuse, including GUIs.[3]

This article considers whether the same economic analysis should apply to the burgeoning law of design patents. I submit that it does. In fact, though this article is limited to GUIs, the analysis could apply to any type of design patent where success drives imitation in the idea of the design, rather than the exact design itself.

First, courts should be the gatekeepers of the ornamental/functional divide. They currently do so for bench trials, but have been hesitant to do so for jury trials. Thus, the groundwork is laid for courts to act as a gatekeeper in all cases. Judicial gatekeepers are an easier argument for copyright law because copyrights are not examined. As a result, copyright litigation is the first chance for an authoritative body to consider difficult questions.

Because patents are examined, however, the PTO could weigh in on functionality, thus arguably alleviating the need for courts to do so. To be sure, examination necessarily shifts much of the analysis earlier than the infringement lawsuit, judges might still act as gatekeepers. Because the importance of a GUI design can change over time, judges faced with competing products will be in a better position than patent examiners to assess future social welfare associated with protecting a GUI or allowing reuse.

Second, courts hearing design patent cases should consider the same economic factors that are critical to copyright—substitution, customers, and competitors—when assessing design patent protection. They should do so because the same factors will maximize social welfare. They should also do so because these factors are consistent with the statutory requirements for ornamental protection.

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[3] For example, the analysis on pp. 30 relating to competitive need to reuse closely mirrors the facts and eventual outcome in the Oracle v. Google copyright trial. Michael Risch, *Oracle v. Google: Digging Deeper*, MADISONIAN (May 9, 2012), http://madisonian.net/2012/05/09/oracle-v-google-digging-deeper/.

This article proceeds in three parts:

Part I briefly describes design patents, some important differences from copyright, and high grant rates. Part II introduces key concepts associated with GUI patents, namely functionality, ornamentality, and ephemerality. This part introduces the core concern: determining whether a GUI infringes a patent when it reuses some elements but does not copy the design exactly. Part III summarizes the economic considerations for determining when to allow reuse under copyright law. Part IV applies those considerations to design patent protection. First, it concludes that the same considerations should continue to apply to design patents, at least with respect to GUIs. Second, this part examines how the economic factors might apply to design patents.

I. DESIGN PATENT BASICS

Design patents protect non-useful aesthetic product designs: "Whoever invents any new, original, and ornamental design for an article of manufacture may obtain a patent therefor. . . ."[4] As discussed below, an "article of manufacture" currently includes parts of articles of manufacture, including the shape of just one side of a device,[5] ornamental attachments to devices,[6] and images appearing on devices.[7] Protection lasts for 14 years from the date the patent is granted.[8] In this sense, the protection for a patent is much shorter than for copyrights, which last for ninety-five years for corporate owned works.[9]

With the shorter duration for design patents comes stronger protection.[10] First, unlike copyright, one need not copy to infringe.[11] Any use of the design brings liability, and there is no independent development defense. Second, there is no fair use defense; any infringement brings liability, no

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[4] 35 U.S.C. § 171.

[5] *See, e.g.*, Patent No. D618,677 (filed Jan. 5, 2007) (claiming only front face of iPhone)

[6] *See, e.g.*, Patent No. D618,244 (filed Oct. 19, 2009) (claiming "clip" that attaches to electronic device).

[7] *See, e.g.*, Patent No. D675,639 (filed Sept. 19, 2011) (claiming portion of slide to unlock icon but nothing else)

[8] 35 U.S.C. § 173.

[9] 17 U.S.C. § 302.

[10] *But see* Sarah Burstein, *Not (Necessarily) Narrower: Rethinking the Relative Scope of Copyright Protection for Designs*, 3 IP THEORY 114 (2013) (arguing that design patents do not necessarily provide stronger protection than copyright).

[11] *Compare* 17 U.S.C. § 501 (defining infringement as violation of a right, for example, to make copies) with 35 U.S.C. § 271(a) (outlawing the making, using, or selling of an infringing product).

matter the nature.[12] Third, design patents allow for much greater damages: *all* of the defendant's profits.[13] Copyright damages, on the other hand, allow the defendant to show that its profits were not due to the infringement.[14]

A designed (pun intended) safeguard on the power of these patents is that they must survive the rigors of patent examination. Only those designs that are novel and non-obvious may be granted.

But this safeguard provides no safety. It appears that examination fails to rigorously separate the wheat from the chaff. An examination of design patents granted shows a 90% grant rate,[15] with an average pendency of merely 15 months (and only 13 months for the vast majority that were granted on the first office action).[16] Pendency is slightly longer for GUI designs, at just under 19 months,[17] but with pendency of less than one year in expedited procedures.[18] In contrast, the average pendency of utility patents during the same time period was more than 4 years for the most common filing type.[19]

To be sure, some of the pendency may be due to a better application to examiner ratio for design patents. On the other hand, design patents tend to cite a lot of prior art (20.6 mean, 13 median), and examiners added more than half of that prior art from their own searches (11 mean, 9 median).[20] Further, GUI design patents cited on average even more than the mean for all patents (24.6 mean, 16 median),[21] and of those, examiners added nearly two-thirds of all references![22]

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[12] 35 U.S.C. §271(a).

[13] 35 U.S.C. § 289.

[14] 17 U.S.C. § 504(b).

[15] Dennis Crouch, *Design Patent Prosecution*, DESIGN PATENTS IN THE MODERN WORLD, at 24-25 (Conference Proceedings, Apr. 5, 2013) http://www.law.stanford.edu/sites/default/files/event/322028/media/slspublic/final_new_pptx_658586_1-full_size-op-1.pdf

[16] Id. at 26.

[17] Du Mont & Janis, *Virtual Designs*, *supra* note 41, at *29 (reporting pendency for 2012; the difference is statistically significant compared to other design patents).

[18] Id.

[19] Dennis Crouch, *Update on Patent Pendency*, PATENTLY-O (Apr. 30, 2010), http://www.patentlyo.com/patent/2010/04/average-pendancy-of-utility-patents-issued-april-27-2010claim-priority-to-foreign-applicationyesnoclaim-priority-to-us-no.html.

[20] Reflects all issued patents since 2005. Data on file with author. The number of references cited has increased with time. Du Mont & Janis, *Virtual Designs*, *supra* note 41, at *34.

[21] Du Mont & Janis, *Virtual Designs*, *supra* note 41, at *36. The comparison is more striking given the timeframes. The averages I report are from 2005 to 2012, while Du Mont & Janis report since 1996. Du Mont & Janis note substantial growth in citations since 1996, which implies that an average dating to 1996 should be *smaller* than an average dating to 2005, not *larger*.

[22] Du Mont & Janis, *Virtual Designs*, *supra* note 41, at *38.

Despite finding all of this relevant art,[23] examiners almost *never* reject based on prior art. First, patents are rarely rejected. Only 19% of GUI Patents receive any rejection at all. The other 80+% issue unassailed.[24] For GUI patents,[25] less than fifteen percent of all rejections were based on novelty or obviousness.[26] And applicants may well have surmounted those, since there were very, very few final rejections (60 out of about 556 rejections since 1996).[27] The numbers for animated designs are even more startling: *not one single rejection* based on novelty or obviousness. Ever (at least since animations were blessed in 2006).[28] Taking all the data together,[29] as few as 2.5% of patents received a prior art rejection of any kind.[30]

It is clear that GUI patents are better examined than other design patents,[31] and yet the "base" rejection rate is so low that even quadrupling it for GUIs provides almost no actual examination based on the prior art, despite the fact that examiners appear to have no problem finding more GUI prior art than any other kind. As discussed further below, lax examination (and the court-defined obviousness rules that allow it) is problematic, given that no defenses allowing reuse currently exist.

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[23] By comparison, examiners add only 25% of the references for utility patents. Du Mont & Janis, *Virtual Designs*, *supra* note 41, at *38 n 180. Despite this, novelty and obviousness rejections are far more frequent. Id. at *43 (noting studies that show 86% of utility patents receiving at least one rejection).

[24] Du Mont & Janis, *Virtual Designs*, *supra* note 41, at *42.

[25] Non-GUI design patents are virtually never rejected; only 3.37% of all rejections since 1996 were for novelty or obviousness, and of those, *not one single rejection* in the sample group cited novelty or obviousness. Du Mont & Janis, *Virtual Designs*, *supra* note 41, at *44.

[26] Du Mont & Janis, *Virtual Designs*, *supra* note 41, at *44.

[27] Id.

[28] Id. at *45.

[29] This calculation is necessarily an approximation, since there were more rejections than there were patents, meaning that some patents may have been responsible for multiple rejections. Further, file wrappers were not available for some patents, which I assume means no rejections.

[30] Du Mont and Janis report a more conservative number of 7.5%, based only on those patents with a file wrapper, whereas I consider all patents. Du Mont & Janis, *Virtual Designs*, *supra* note 41, at *46. Crouch, *supra* note 15, at 25, reports 1.2% rejection rate for all design patents. It is, of course, possible that other patent applications were rejected or abandoned based on prior art. However, the grant rate is 90%, so even if every single ungranted patent were rejected for prior art, the total percentage would still be very small.

[31] Du Mont & Janis, *Virtual Designs*, *supra* note 41, at *46 ("What we can say is that there is no support for the position that design patents on virtual designs are of dubious quality compared to other classes of design patents.").

II.   FUNCTIONALITY, ORNAMENTALITY, AND EPHEMERALITY

Design patents protecting GUIs evoke important threshold questions relating to the protection of functional elements, or whether GUI elements are properly protected by design patents at all.

The first design patent statute, enacted in 1842, envisioned protection for novel drawings and images incorporated into articles of manufacture.[32] The protection was extremely important for design protection at the time, because drawings, paintings, and photographs were not protected under the Copyright Act until 1870.[33]

Meanwhile, the language of the design patent statute caused great distress. Because it protected "useful" designs, inventors obtained design patents on new shapes for well-known useful inventions. As the Commissioner of Patents stated in *Ex Parte Crane,*[34] the first decision to interpret this part of the statute:

> The line of distinction between what is useful and what is merely ornamental is, in some cases, very indefinite. By some it is said that any form or design that is most useful, is also most pleasing. It would be impossible, in the view of such persons, to make any improvement in utility that did not at the same time add to the ornamental and artistic.
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> I can perceive no necessity for the distinction. There is a large class of improvements in manufactured articles that are not regarded as new inventions, or as coming within the scope of general patent laws. They add to the market value and salability of such articles, and often result from the exercise of much labor, genius, and expense. They promote the best interests of the country, as well as the creations of inventive talent. It seems to me to have been the intent of Congress to extend to all such cases a limited protection and encouragement. Whenever there shall be produced by the exercise of industry, genius, effort and expense, any new and

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[32] Patent Act of August 29th, 1842, 5 Stat at Large543, § 3 (protecting any "new and useful pattern, or print, or picture, to be either worked into or worked on, or printed or painted or cast or otherwise fixed on, any article of manufacture…."

[33] Act of July 8, 1870, §§85-111, 41st Cong., 2d Sess., 16 Stat. 198, 212-16; *cf. Copyright*, 3 Am. L. Rev. 453, 454-55 ("It was also contended that [the infringed stage play scenes], were not of a literary, but of a mechanical order, and not subject to the protection of the Statute of Copyright; and that the scene . . . must be protected by . . . design patents for the scenery and properties."); Donald M. Millinger, *Copyright and the Fine Artist*, 48 GEO. WASH. L. REV. 354 (1980).

[34] Ex Parte Crane (Dec. Comm'r Patents Apr. 20, 1869) (patent granted on new arrangement of product that had already been denied a utility patent as non-novel: ").

original design, form, configuration or arrangement of a manufactured article, it comes within the provisions and objects of the act creating design patents, whatever be its nature, and whether made for ornament merely, or intended to promote convenience and utility.[35]

This ruling led to the rise of so-called "patent sharks" that would extract payments from unsuspecting farmers using farm equipment that looked similar to new designs.[36]

In 1902, the Commissioner of Patents requested that Congress eliminate the word "useful" from the statute, noting that design patents were never intended to protect functional equipment.[37] Instead, the word "ornamental" was introduced into the statute, where it has remained until today.

Early courts struggled with the amendment, but quickly settled on a rule that also still applies: if a design is primarily ornamental, then the fact that it has some functional elements will not disqualify it from protection.[38]

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[35] Id. *See also* Ex parte Bartholemew (Dec. Comm'r Patents Dec. 7, 1869) ("In thus denying that a new 'shape or configuration' of an article, whereby utility or convenience is promoted, is the proper subject of a patent, under the acts referred to, the office would seem to have involved itself in the absurdity that if a design is useless it may be patented, whereas if it be useful it is entitled to no protection. Fortunately . . . office is relieved from so grievous an imputation. . . . Articles have been, and are being constantly, patented as designs which possess no element of the artistic or ornamental, but are valuable solely because, by a new shape or configuration, they possess more utility than the prior forms of like articles.").

[36] Gerard N. Magliocca, *Blackberries and Barnyards: Patent Trolls and The Perils of Innovation*, 82 NOTRE DAME L. REV. 1809, 1820-21 (2007); *see also* Annual Report of the Commissioner of Patents for 1872 (Jan. 23, 1872) ("Very many design patents, which cannot, under the law, be denied, are a fraud upon the public. A man applies for a patent on a cultivator, or hammer, or any other useful tool or device, and finding himself fully anticipated in every principle and useful feature of his invention, abandons his application and at once applies for a design patent for the same thing. This application he bases upon some peculiarity of form or color, having nothing whatever to do with the merits or demerits of the article itself; and not being anticipated in these respects, a patent is granted for the new design. The patent gives him no protection whatever, except as to the form or color upon which it is based.").

[37] U.S. Senate, Committee on Patents, *Amending Section 4929, Revised Statutes* (S. Rep. No. 1139). Apr. 15, 1902.

[38] Mygatt v. Zalinski, 138 F. 88, 89 (C.C.D.N.Y. 1905) ("That it is useful as well as ornamental does not affect its patentability as a design patent."); *compare* Ashley v. Weeks-Numan Co., 220 F. 899, 901 (2d Cir. 1915) ("[W]e declare that the subject-matter of a patent is not rendered unfit as a design patent by the mere fact that it is possible somewhere in its construction to discover a mechanical function.") *with* Best Lock Corp. v. Ilco Unican Corp., 94 F.3d 1563, 1566 (Fed. Cir. 1996) ("However, if the design claimed in a design patent is dictated solely by the function of the article of manufacture, the patent is invalid because the design is not ornamental.")

Another change in the 1902 amendment was the elimination of incorporation of pictures and drawings from the statute.[39] The legislative history implies that the removal was of superfluous material,[40] and since that time, designs patents with drawings have continued to issue.

The 1902 amendment (and practice since that time) leads to the first two questions discussed above.

A. *Should Design Patents Protect Purely Copyrightable Material?*

First, given that copyright law expanded to protect the previously unprotected pictorial and graphic works, perhaps design patents should not be used to protect such works separately from articles of manufacture. In other words, copyright might perform a channeling function to protect non-product-based images. One favoring channeling might argue that design patent laws could not have been intended to protect copyrightable images from all uses without the benefit of fair use, independent creation, idea/process, or other defenses.

The 1902 amendment has not received enough attention, at least not on this question. The 1842 inclusion of protection for pictures and drawings in design patents was instituted long before copyright protection protected such works. After copyright began protecting such works, Congress should have reconsidered design patent protection more explicitly, but it did not[41] and it has not.[42]

At the time, the Commissioner of Patents foresaw a channeling function. In requesting the 1902 amendment, the Commissioner of Patents noted:

It is thought that if the present bill shall become a law the subject of

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[39] Revised Stat. 4929, PL 57-109, 32 Stat. 193 (May 9, 1902).

[40] S. Rep. 1139, *supra* note 37; *see also*, Harold Binney, Present Status of the Law Relating to Designs, 25 Annu. Rep. A.B.A. 662, 664 (1902) (arguing that changed language did not eliminate design patent protection for drawings and printed materials).

[41] Binney, *supra* note 40, at 662 (describing how new statute was passed within a one month period, with no input from any patent practitioners or other members of the public); In re Schnell, 46 F.2d 203, 205 (CCPA 1931) (holding that amendment did not change protection for application of pictoral works to manufactures), *citing* Ex Parte Fulda, 1913 C.D. 206.

[42] Mazer v. Stein, 347 U.S. 201, 217 (1954) (failing to mention 1902 amendment: "We do hold that the [design] patentability of the statuettes, fitted as lamps or unfitted, does not bar copyright as works of art."). Indeed, copyright thinking still struggles with drawings and photographs today, even without consideration of design patents. Rebecca Tushnet, *The Images of Copyright*, 125 HARV. L. REV. 683 (2012); Christine Haight Farley, *The Lingering Effects of Copyright's Response to the Invention of Photography*, 65 U. PITT. L. REV. 385 (2004).

design patents will occupy its proper philosophical position in the field of intellectual production, having upon the one side of it the statute providing protection to mechanical constructions possessing utility of mechanical function, and upon the other side the copyright law, whereby objects of art are protected, reserving to itself the position of protecting objects of new and artistic[43] quality pertaining, however, to commerce, but not justifying their existence upon functional utility. If the design patent does not occupy this position there is no other well-defined position for it to take.[44]

This quote could be interpreted in two ways. On the one hand, it implies that there should be some channeling between artistic and commercial images. On the other hand, it implies that copyrighted works can be patented, so long as they are "artistic" (now ornamental) and part of a commercial design.

In practice, both readings have applied. There are artistic works that do not qualify for patent protection, having been successfully channeled. Indeed, the U.S. Patent & Trademark Office's (USPTO's) examination guidelines for computer icons[45] makes clear that the difference between patentable and unpatentable images is a clear drawing and claim placing the image on a display screen or other object. Images not tied to display screens are not considered articles of manufacture.[46] But the channeling is incomplete; one may surmount the "display" hurdle without any trouble whatsoever.[47] For artistic works, a simple dotted line denoting attachment to some article of manufacture ends the inquiry.

Thus, the notion that GUIs are copyrightable is unlikely to affect design patentability, even if it could have in 1902 or should today.

B. Are Ephemeral Interfaces Really Articles of Manufacture?

Today, design patents cover images, and only images, displayed on a screen.[48] As many claims are written, merely viewing an image on a blog

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[43] The commissioner's proposed "artistic" requirement was changed to "ornamental" in the final statute.

[44] S. Rep. 1139, *supra* note 37.

[45] MPEP 1404.01(a).

[46] Id.

[47] Mazer v. Stein, 347 U.S. 201, 217 (1954) (allowing copyright or design patent protection of a functional lamp). *See, e.g.*, Mark P. McKenna & Katherine J. Strandburg, *Progress and Competition in Design*, __ STAN. TECH. L. REV. __ (forthcoming 2013) (arguing that design patents might be justified by integration of design and function, but cannot be justified to protect surface ornamentation).

[48] *Apple Patents an Encircled Musical Note*, PATENTLY-O (Oct. 25, 2012) ("The

page or in a PDF file associated with this article (which includes some patented images) would constitute infringement. From a theoretical point of view, something seems off about that: viewing an image on a display screen can hardly be considered an article of manufacture, yet the law outlaws precisely such use, *even if one is simply viewing the patent itself on a computer*![49]

Thus, the second threshold question is whether an ephemeral image, viewable anywhere and in any context, can be considered an "article of manufacture" under the statute. The guidelines, issued in 1996, give surprisingly little attention to this question. Courts have long held that "surface ornamentation" constitutes an article of manufacture,[50] and displayed images are part of a surface. Thus, the guidelines only ask whether the image is part of a display, not whether an ephemeral image is they type of thing that should *ever* be protected.

Even if one accepts that copyrightable works should be protected by design patent, this does not mean that all copyrightable expression qualifies for patent protection. Consider, for example, protection of structure, sequence, and organization of factual information. This may well be protected by copyright,[51] but does not fall under the design patent umbrella.

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question: Is Patently-O infringing the design patent by showing the image on your screen?"), http://www.patentlyo.com/patent/2012/10/apple-patents-an-encircled-musical-note.html.

[49] 35 U.S.C. § 271(a) ("[W]hoever … uses … any patented Invention … infringes the patent."). Indeed, simply copying the patent on paper might be an article of manufacture; it is unclear whether the display screen is a binding limitation. Further, patents need not limit themselves, since designers could place the image any article of manufacture—like a coffee mug or t-shirt.

[50] Mygatt v. Zalinski, 138 F. 88 (C.C.D.N.Y. 1905) (reflector surface design); Phoenix Knitting Works v. Hygienic Fleeced Underwear Co., 194 F. 703, 706 (C.C.D. Pa. 1911) ("The alleged new design therefore may safely be said to reside in the surface ornamentation" of a neck scarf), *aff'd on other grounds,* 194 F. 696, 699 (3d Cir. 1912) ("The design must be ornamental when the scarf is on the neck of the wearer, and not be such as to only fulfill its purpose as an ornamental design when it is lying flat upon a table."); Macbeth-Evans Glass Co. v. Rosenbaum Co., 199 F. 154, 167 (D. Pa. 1912) ("The evidence shows that both the infringing [lamp] shade and the Evans shade were exhibited for sale while lighted, and it is while lighted that the proposed purchaser will observe them."). *See also,* Jason J. Du Mont & Mark D. Janis, *The Origins of the American Design Patent System*, 88 IND. L.J. __ (forthcoming 2013) (discussing surface ornamentation at foundation of design patent system); Jason J. Du Mont & Mark D. Janis, *Virtual Designs*, __ STAN. TECH. L. REV. __, at *4-*6 (forthcoming 2013) (discussing surface ornamentation rules). Indeed, the design patent that led to the rule that infringers must pay all of their profits as damages involved the surface design of a rug. Mark Lemley, *A Rational System of Design Patent Remedies*, __ STAN. TECH. L. REV. __ (forthcoming 2013), http://ssrn.com/abstract=2226508.

[51] Kregos v. Associated Press, 937 F.2d 700, 710 (2d Cir. 1991) ("Kregos can obtain a copyright by displaying the requisite creativity in his selection of statistics. But if someone

This may seem like a silly comparison, but a comparison of the interface patents to infringing devices below will show that courts could allow protection of design structure rather than particular images in the future.

Furthermore, protection of user interfaces essentially merges the copyright law's fixation requirement with patent law's article of commerce requirement. Fixation is the cornerstone of copyright: no work can be protected if it is not fixed in a tangible medium.[52] But fixation is far from permanent; loading a file into computer memory is sufficiently fixed, even if the computer could be turned off or the memory changed.[53]

The question, then, is whether any image present in computer memory—fixed, to be sure—becomes an "article of manufacture," even if it is not displayed on the screen at all times. Thus far, the PTO has said yes, and courts have not asked the question, assuming that if a patent issued, then it must be an article of manufacture. Indeed, design patents now protect "animations," which are a series of images that move in sequence, such as a spinning icon or a simulated folding of a page to emulate a book on a display screen.[54]

Protection of displays appears to rest on two seminal cases issued by that Court of Customs & Patent Appeals, the precursor to the Federal Circuit. Both are cited by the PTO guidelines.[55] The first case is *In re Hruby*,[56] which held that the shape of water moving in a fountain could be a patented design, even though the water was moving and could be turned off. The court reasoned that the ornamental result (the water) was not fleeting, but was instead a predictable and permanent aspect of the fountain's design.[57]

The second precedent is *In re Zahn,*[58] in which the CCPA ruled that a

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else displays the requisite creativity by making a selection that differs in more than a trivial degree, Kregos cannot complain."); CDN Inc. v. Kapes, 197 F.3d 1256, 1260 (9th Cir. Cal. 1999) ("The prices listed are not mere listings of actual prices paid; rather, they are CDN's best estimate of the fair value of that coin. To arrive at this estimate, CDN employs the process described above that satisfies the 'minimal degree of creativity' demanded by the Constitution for copyright protection.").

[52] 17 U.S.C. §§ 102(a), 101.

[53] MAI Sys. Corp. v. Peak Computer, 991 F.2d 511, 518 (9th Cir. 1993) (loading software into RAM creates "fixed" copy).

[54] David Leason, *Design Patent Protection for Animated Computer-Generated Icons* 91 J. PAT. & TRADEMARK OFF. SOC'Y 580, 585-87 (2009); MPEP § 1504.01(a)(IV); In re Koehring, 37 F.2d 421, 423-24 (C.C.P.A. 1930) (holding that moving parts does not change patentability).

[55] MPEP § 1504.01(a)(I).

[56] 373 F.2d 997 (C.C.P.A. 1967).

[57] Id. at 999 ("We . . . would add that the permanence of any design is a function of the materials in which it is embodied and the effects of the environment thereon.").

[58] 617 F.2d 261 (C.C.P.A. 1980).

portion of a manufacture could be separated by a "broken line" to separate the new, protectable design from the preexisting remainder of the article.[59] Though the notion that a portion of an article could be patented is more than 140 years old,[60] the *Zahn* court's broken line rule leads to the near ubiquity of broken lines in graphical displays that separate the image from the rest of the display.[61]

Despite the apparent reasonableness of *Hruby* and *Zahn* with respect to the facts of those cases, their extension to user interfaces is troubling. Courts and commentators have simply not asked the difficult questions. Collapsing fixation, animation, and display screen into an "article of manufacture" leaves design patents on a very slippery slope.

For example, there is no theoretical bar to protecting every displayed copyrightable work with a design patent. Every television show and movie is theoretically a novel and non-obvious design to be incorporated into display screens everywhere. Indeed, every photograph captured and displayed on every mobile device might be protected. Every doodle on an electronic Etch-a-Sketch could be patented. Any use of the material would be infringing, without any consideration of fair use, the ideas represented by the work, or even the first amendment.

Further, and perhaps more unsettling, the only apparent reason why such claims have not been made before is that nobody thought to do so, because there is no body of law to avoid such an outcome.[62] The PTO has almost no tools to reject small, or even large,[63] snippets of movies. While only a single inventive design may be covered by a patent, multiple patents might be filed on different—but important—segments of audiovisual works, sufficient to block all downstream use with no fair use defense. A design patent protecting four or five screencaps from the famous Hitler Downfall movie scene would eliminate all claims to fair use of that short but endlessly entertaining parody clip.[64] The PTO has no track record of

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[59] Id. at 269 ("While the design must be embodied in some articles, the statute is not limited to designs for complete articles, or 'discrete' articles, and certainly not to articles separately sold. . . . No sound authority has been cited for any limitation on how a design is to be embodied in an article of manufacture."). *Zahn* involved a shank on a drill bit, and only the "ornamental" design of the shank was protected.

[60] Gorham Co. v. White, 81 U.S. (14 Wall.) 511, 521 (1871) (affirming patent on spoon and fork handles, but not the spoon/fork portion.

[61] Leason, *supra* note 54.

[62] And, to be fair, perhaps the cost of obtaining a patent.

[63] Patentees submit an average of 7 figures per patent, though one patent issued since 2005 submitted as many as 216 figures. Data on file with author.

[64] *Hitler Downfall Parodies: 25 Worth Watching*, THE TELEGRAPH (Oct. 6, 2009), http://www.telegraph.co.uk/technology/news/6262709/Hitler-Downfall-parodies-25-worth-watching.html. Two of my personal favorites are Hitler learns his teaching schedule, http://www.youtube.com/watch?v=mLC7Q3DTzi4, and Hilter is Furious at the Supreme

rigorously examining images to determine whether they are novel or obvious. Even if it did, the exact combination of images in that screen are unlikely to appear elsewhere.

This parade of horribles might be solved in two ways. First, courts could recognize that an article of manufacture (or portion thereof) requires more than copyright fixation. Instead, an article of manufacture requires permanence at the point of manufacture, display, and use. To be sure, many elements might be hidden at one point or another, such as bottoms of drawers, collapsible devices, folding elements that become hidden, or even water fountains. But each of these examples is different in kind from the ephemeral images on a display screen. Ephemeral images can be configured by moving bits in memory, and as such, they are not ornamental articles of manufacture; instead, they are displays of information. In short, the PTO's 1996 concern about patenting of images was well-founded, but the solution was not to add "on a display screen" to patent claims. Instead, the solution was to recognize that images divorced from manufacture do not qualify as articles – they can be shown on *any* article, any screen, and any device, and that is not what design patents are meant to protect.[65]

A second solution might recognize that modern commercial products live under a big tent. As such, there may be times when the design of the product includes designs on the screen. However, protection for displayed surface designs should be limited in a number of ways to ensure that the design is an ornamental article of manufacture, rather than an ephemeral image.

1. Limitation: Original Manufacture and Distribution

First, such designs should be limited to the original manufacture and distribution of devices that include the image. This would exclude protection for images introduced on devices after manufacture and sale. It would also exclude infringement by the display of images unassociated with the original product, such as broadcast images or photographs.

Design patent owners would surely object to this limitation; they would argue that it would allow competitors to "copy" their designs by downloading images to existing devices at some later date. And they would be right – some newly developed icon, screen organization or other design

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Court for Granting Cert to Bilski, http://www.youtube.com/watch?v=NMszkJC6v9M.

[65] *But see*, Du Mont & Janis, *Virtual Designs*, *supra* note 41, at *10-12 (discussing drawing of Peter Rabbit for use on many types of products and design patents for type fonts that can be patented without consideration of a display screen); Adobe Sys. Inc. v. Southern Software Inc., 45 U.S.P.Q.2d 1827, 1832-33 (N.D. Cal. 1998) (holding that type fonts are design and software that displays this is article of manufacture).

could be used by others *who do not produce them as an article of manufacture*.[66] In other words, if the broken line is critical to show that the design is part of a display then distribution of the image separated from that display cannot be an article of manufacture, even under existing law. Just as Hruby's water-fountain shape is protected because some underlying mechanics reliably created it, his design would not be protected if one could replicate the water movement through some other form of water manipulation that did not involve a manufacture.[67]

Limiting protection (and infringement) to original manufacture and distribution would not destroy the incentives of the design patent statute. In fact, such limitations have been suggested before as part of a proposal to encourage innovation.[68] Companies would still have an incentive to design novel displays, because competitors could not use those displays in their product designs. This would provide a competitive advantage at the point of sale. Presumably, rules could be developed that stop competitors from avoiding the rule by selling empty devices that are updated soon after sale.

2. Limitation: Rigorous Obviousness Rules

Second, if displayed images are protected as articles of manufacture, then the PTO must rigorously examine such applications and actually reject some on novelty and obviousness bases. This is easier said than done for legal and practical reasons. Legally, the obviousness rules for design patents are incredibly permissive; virtually nothing is obvious.[69] Thus, examiner hands are tied to some extent.

The rigid rules for finding obviousness must be read to be believed. The

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[66] Gorham Co. v. White, 81 U.S. (14 Wall.) 511, 528 (1871) (requiring design patent infringement to be determined at the point of sale: "[I]f, in the eye of an ordinary observer, giving such attention as a purchaser usually gives, two designs are substantially the same, if the resemblance is such as to deceive such an observer, inducing him to purchase one supposing it to be the other, the first one patented is infringed by the other."); *but see*, Contessa Food Prods., Inc. v. Conagra, Inc., 282 F.3d 1370, 1379-80 (Fed. Cir. 2002) (requiring infringement analysis at any time during normal use lifetime of the product, not just the time of sale).

[67] *See, e.g.*, M. Night Shyamalan, The Last Airbender (2010) (character shapes water using telekinesis). Indeed, the *Hruby* Court made clear that the patentee was in the "fountain selling" business – it wasn't selling "water," but instead the underlying pumps and hoses. In re Hruby, 373 F.2d 997, 1000 (C.C.P.A. 1967).

[68] Frank W. Dahn, *Designs – Patents or Copyrights*, 10 J. PAT. OFF. SOC'Y 297, 298 (1928) (describing proposed legislation to limit design protection to sale of designed article).

[69] Crouch, *supra* note 15, at 25. *But see* Titan Tire Corp. v. Case New Holland, Inc., 566 F.3d 1372 (Fed. Cir. 2009) (affirming denial of preliminary injunction based on probably finding of obviousness).

rules require a prior design that is *nearly identical* to the patented design before the analysis can even begin. The court in *Apple v. Samsung*[70] describes it clearly:

> To determine whether 'one of ordinary skill would have combined teachings of the prior art to create the same overall visual appearance as the claimed design,' the finder of fact must employ a two-step process." [] "First, 'one must find a single reference, a something in existence, the design characteristics of which are basically the same as the claimed design.'" [] "Second, 'other references may be used to modify [the primary reference] to create a design that has the same overall visual appearance as the claimed design.'" [] "However, the 'secondary references may only be used to modify the primary reference if they are so related to the primary reference that the appearance of certain ornamental features in one would suggest the application of those features to the other.'"[71]

This two-step test is limiting in two ways: a) it stacks the deck in favor of validity by requiring that one piece of prior art is *basically the same* as the patented design, and b) it only allows combination upon specific suggestion.[72] *Hupp v. Siroflex*[73] is illustrative. In *Hupp*, the patentee claimed a stamp used to make concrete look like stone. Other such stamps existed, but not in the design claimed by the inventor. At trial, the jury found that the primary reference was a series of ceramic tiles that looked like Hupp's design—at least the design of the concrete once it was stamped. Hupp argued that even if one saw ceramic tiles of the same pattern, it would not render a *stamp* to make that pattern obvious. The court agreed, ruling that: "We have been directed to no teaching or suggestion to a person of ordinary skill to look to a floor tile construction and convert it into the design of a mold to make a concrete simulated stone outdoor walkway."[74] In *Hupp*, even an identical design was not enough, because the rules assumed that no designer would convert a tile design to a stone stamp design, even knowing that other stamp designs were available on the

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[70] Order Granting in Part and Denying in Part Motion for Judgment as a Matter of Law, Apple, Inc. v. Samsung Elec. Co. Ltd., Case No. Case No.: 11-CV-01846-LHK (Document 2220, Jan. 29, 2013).

[71] Id. at 6 (citations omitted), *quoting in part* Apple, Inc. v. Samsung Electronics Co., Ltd., 678 F.3d 1314, 1329 (Fed. Cir. 2012).

[72] Du Mont & Janis, *Virtual Designs*, *supra* note 41, at *57 (arguing that current test is easily misapplied with respect to GUI patents).

[73] *See, e.g.,* Hupp v. Siroflex of Am., Inc., 122 F.3d 1456, 1462-63 (Fed. Cir. 1997) (reversing a finding of obviousness of a stamp to create simulated.

[74] Id. at 1463.

market. Surely a stamp designer would think to make a new design in a stamp upon seeing a pleasing tile design; utility patent rules would find such a combination obvious.

Thus, although design patents are examined under the same obviousness statute as utility patents,[75] the rules do not seem to apply the same obviousness standards as utility patents.

Indeed, the current design patent rule has its genesis in the Federal Circuit's former "teaching-suggestion-motivation" test.[76] The teaching-suggestion-motivation test required some explicit suggestion in the prior art that references be combined. This, of course, is nearly impossible with designs, which are almost always depicted graphically, and thus cannot suggest or teach anything in the way that an academic article or patent might. This might account for the Federal Circuit's two-step rule: requiring prior that is nearly identical is the only way to assure that there is a suggestion in a prior art.

In addition to permissively allowing patents, both the two-step and the teaching-suggestion-motivation tests are rigidly applied, and outlaw the use of not only common creativity but also common sense. Such a rigid approach was unambiguously and unanimously rejected by the Supreme Court in *KSR v. Teleflex.*[77] In *KSR*, the Court ruled that obviousness determinations should be flexible. The court noted that inventors are not automatons, and possess ordinary creativity.[78] Further, references might be combined for many reasons, including market factors and limited choices available to solve a known problem.[79]

After *KSR,* the bright-line, strait-jacket test of design patent obviousness must be rejected.[80] Current rules are neither supported by statute nor Supreme Court precedent. Indeed, design patents should be (and used to be) judged like any other patent.[81] Surprisingly, the rigid rule is still used.[82]

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[75] 35 U.S.C. § 103.

[76] In Apple v. Samsung, the lineage of the two-step rule is traced to Durling v. Spectrum Furniture Co., Inc., 101 F.3d 100, 103 (Fed.Cir.1996). The rule is much older, though. In re Rosen, 673 F.2d 388, 391 (CCPA 1982); L.A. Gear, Inc. v. Thom McAn Shoe Co., 988 F.2d 1117, 1124 (Fed. Cir. 1993) ("[Defendant] offered twenty-two references that were asserted to show or suggest various features of the '081 design, and argues that the '081 design is readily reconstructed from elements found in the prior art. . . .The district court concluded that there was no teaching or suggestion in the prior art of the appearance of the claimed design as a visual whole. We discern no error. . . .")

[77] KSR Int'l Co. v. Teleflex Inc., 550 U.S. 398 (2007)

[78] 550 U.S. at 421.

[79] 550 U.S. at 424.

[80] 550 U.S. at 421 ("Rigid preventative rules that deny factfinders recourse to common sense, however, are neither necessary under our case law nor consistent with it.").

[81] Blisscraft of Hollywood v. United Plastics Co., 294 F.2d 694, 695 (2d Cir. 1961) ("What plaintiff did amounted to nothing more than an unstartling regrouping of old

Practically, it may be difficult for patent examiners to find displays to use as prior art. Such displays are not part of any database. This concern only goes so far, however. As discussed above, design patents cite on average more than twenty prior art references, which are both prior design patents and products disclosed by inventors. Despite these references, there are almost never rejections based on references the examiner thought relevant enough to cite. Not requiring inventors to explain—even once— why their designs rise above the prior art diminishes the entire process.

3. Limitation: Infringement and Filtration

Better rules that eliminate obvious patents before they issue would be preferable to leaving all decision-making until litigation. Even so, if disputes do arise, more critical consideration of infringement standards can alleviate many GUI design patent concerns. The conventional wisdom among lawyers I have met is that design patent protection is extremely narrow, requiring nearly identical features.[83] They are surprised when they

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elements which demonstrated no originality born of inventive faculty. This is not enough."); *but see* Jason J. Du Mont, *A Non-Obvious Design: Reexamining the Origins of the Design Patent Standard*, 45 GONZAGA L. REV. 531, 599-604 (2010) (arguing that design patents were never intended to be judged by an obviousness standard, and that permissive obviousness rules are a product of standard that had become too harsh). Perhaps courts have overcorrected, because the standard is virtually non-existent now.

[82] Apple, Inc. v. Samsung Elecs. Co., 678 F.3d 1314, 1329-30 (Fed. Cir. 2012) (applying rigid rule without citing to *KSR* but citing pre-*KSR* obviousness rules: "To determine whether 'one of ordinary skill would have combined teachings of the prior art to create the same overall visual appearance as the claimed design,' the finder of fact must employ a two-step process. First, 'one must find a single reference, 'a something in existence, the design characteristics of which are basically the same as the claimed design.' Second, 'other references may be used to modify [the primary reference] to create a design that has the same overall visual appearance as the claimed design.' However, the 'secondary references may only be used to modify the primary reference if they are 'so related to the primary reference that the appearance of certain ornamental features in one would suggest the application of those features to the other.'") (citations omitted) ; *but see*, Titan Tire Corp. v. Case New Holland, Inc., 566 F.3d 1372, 1385 (Fed. Cir. 2009) (affirming under old rules, but leaving open possibility that *KSR* might apply: "it is not obvious that the Supreme Court necessarily intended to exclude design patents from the reach of KSR."). *Apple v. Samsung* cited *Titan Tire* but made no mention of avoiding rigid rules.

[83] *See, e.g.,* Du Mont & Janis, *Virtual Designs*, *supra* note 41, at *60 ("We anticipate that design patents on virtual designs are likely to be used primarily as tools to combat counterfeiting. We are referring to cases in which the accused design is identical to the patented design. . . ."); Bruce A. Kugler & Craig W. Mueller, *A Fresh Perspective on Design Patents*, 38 COLO. LAW. 71, 72 (2009) (describing point of novelty test as allowing easy infringement avoidance). This is not a new understanding. Consider, for example, Arthur W. Cowles, *Mechanical and Design Patents*, 3 J. PAT. OFF. SOC'Y 484, 488 (1921)

learn that merely similar designs might infringe, and even more surprised to learn that those similarities might be the abstracted ideas of the design rather than similarities in the actual images. Even if the Apple v. Samsung case may be the first of its kind, it represents a potential precedent for design patent GUI litigation.

Beginning with the next subsection, the remainder of this Article is dedicated to this topic, which is also the third question from the introduction.

C. Infringement and Filtration

The design patent rule for infringement is similar to that in copyright law: similarity. With design patents, infringement determinations are made by comparing the accused device with the design patent, to see whether the ordinary observer familiar with all of the designs in that field would believe that the accused product is the same as the claimed design.[84] Stated this way, the rule is even easier to satisfy than copyright infringement; one need only be confused about which design is being used.

The infringement rule does not allow for focus on just those elements that are new, the so-called "point of novelty" of the design.[85] Furthermore, the designs need not be exact; they need only be similar enough that the ordinary observer would find similarity.[86]

One potential divergence from copyright law is the absence of filtration in the infringement analysis. A primary mechanism used to allow reuse in copyright law is filtration.[87] Before any copyrighted GUI is compared to an accused GUI, unprotected elements like ideas are filtered out. Only the

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("A mechanical patent is superior to a design patent for the external configuration of the mechanical instrument, because theoretically the properties of the mechanical instrument may be embodied in more than one external configuration, therefore, in more than one design.").

[84] Gorham Co. v. White, 81 U.S. (14 Wall.) 511, 528 (1871) ("[I]f, in the eye of an ordinary observer, giving such attention as a purchaser usually gives, two designs are substantially the same, if the resemblance is such as to deceive such an observer, inducing him to purchase one supposing it to be the other, the first one patented is infringed by the other."); Egyptian Goddess, Inc. v. Swisa, Inc., 543 F.3d 665, 670 (Fed. Cir. 2008) (en banc).

[85] Egyptian Goddess, 543 F.3d at 672-73.

[86] Id.

[87] Nichols v. Universal Pictures Corp., 45 F.2d 119, 121 (2d Cir. 1930) (introducing abstraction and filtration); Computer Assocs. Int'l v. Altai, 982 F.2d 693, 706 (2d Cir. 1992) ("As discussed herein, we think that HN14 district courts would be well-advised to undertake a three-step procedure, based on the abstractions test utilized by the district court, in order to determine whether the non-literal elements of two or more computer programs are substantially similar.")

swiss-cheese creative expression that survives filtration may be asserted against others.

In theory, the design patent rule might still allow for filtration. For example, elements associated with the prior art might be filtered somewhat. After all, the ordinary observer is expected to know the prior art, and to not find infringement where the similarities are based on preexisting designs.[88]

Indeed, some courts have also filtered out functionality elements when testing for design patent infringement.[89] Such filtration would expressly protect ornamental elements, but not functional ones.

In reality, however, filtration is much more difficult to achieve under current practices. Because all prior art is submitted to the jury, any filtration is invisible to the courtroom and thus nearly invulnerable to appeal.[90] Furthermore, while judges are willing to filter out functional elements in bench trials, they are less willing to do so for jury trials, again leaving such determinations unreviewable.[91]

As discussed below, judges should retake this gatekeeping role and filter in every case.

III. THE ECONOMIC ANALYSIS

The economic analysis[92] begins with the revelation that it is too costly – perhaps impossible – to devise a consistent rule regulating reuse of computer software elements that can be consistently applied ex ante.[93] This revelation is reflected in the contrary judicial opinions and scholarly proposals of the time. The discussion here attempts to use this information to explain judicial behavior.

A. Genesis of Reuse

The late 1980's and early 1990's were a time of great uncertainty in

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[88] Egyptian Goddess, 543, F.3d at 672.

[89] Richardson v. Stanley Works, Inc., 597 F. 3d 1288, 1293-94 (Fed. Cir. 2010) (court filtered out functional elements in bench trial).

[90] Apple, Inc. v. Samsung Elecs. Co., 2013 U.S. Dist. LEXIS 13240, *13 (N.D. Cal. Jan. 29, 2013) (adopting deferential standard to jury verdict and assuming jury weighed all prior art.)

[91] Id. at *16 ("The cases do not suggest that this type of claim construction is appropriate when instructing a jury.")

[92] This section includes some of the key relevant analysis from the prior paper. A complete presentation of the model and its defense is offered there.

[93] Risch, *supra* note 2; *see, e.g.,* William F. Patry, *Copyright and Computer Programs: It's All in the Definition*, 14 CARDOZO ARTS & ENT. L.J. 1, 4 (1996) (arguing that courts have "overreacted" and propounded inconsistent definitions of "originality" and "computer program" thus making consistent and efficient decision making difficult).

copyright law with respect to the reuse of computer software elements. Three leading cases ruled in apparently contradictory ways.

In *Whelan v. Jaslow*,[94] the Third Circuit Court of Appeals affirmed a copyright infringement verdict. In *Whelan*, the defendant had worked on a dental office program with the plaintiff and had entered into a joint sales agreement.[95] He then created a competing program that bore some similarity to the plaintiff's program—at least in functionality for dental offices.[96] The court held that the look and feel was sufficient to constitute infringement, even though the similarities were based in part on the needs of a dental office.[97] *Whelan* is now nearly universally derided as overprotecting software.[98]

In *Lotus v. Borland*,[99] the First Circuit seemed to go the opposite direction, ruling that a menu user interface could never be protected because such menus are "modes of operation" unprotected by the Copyright Act.[100] The court likened the menus to buttons on the VCR (or now, a DVD player).[101] The Supreme Court granted certiorari, and the opinion was affirmed by an evenly divided vote due to a recusal.[102] About 15 amici briefs were filed in the case, with only one of them favoring Lotus.

Finally, cases like *Computer Associates v. Altai*[103] presented a reasonable legal rule, but provided too little guidance to aid lower courts in making decisions. The *Computer Associates* court mandated use of the abstraction-filtration-comparison test. Using this test, the court determines the various levels of abstraction in the program—from the very specific expression to the most general ideas presented—and removes uncopyrightable elements. For example, ideas are not protected nor are *scenes a faire*, the common elements one would expect to see associated

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[94] Whelan Assocs., Inc. v. Jaslow Dental Lab., Inc., 797 F.2d 1222 (3d Cir. 1986).

[95] 797 F.2d, at 1226.

[96] Id. at 1227 ("Dentcom [Jaslow] sold both the Dentalab and Dentcom programs, and advertised the Dentcom program as 'a new version of the Dentalab computer system.').

[97] Id. at 1248 ("We hold that (1) copyright protection of computer programs may extend beyond the programs' literal code to their structure, sequence, and organization, and (2) the district court's finding of substantial similarity between the Dentalab and Dentcom programs was not clearly erroneous.").

[98] *See, e.g,* Plains Cotton Coop. Ass'n v. Goodpasture Computer Serv., Inc., 807 F.2d 1256, 1262 (5th Cir.1987) (expressly rejecting portions of *Whelan v. Jaslow).*

[99] Lotus Dev. Corp. v. Borland Int'l, 49 F.3d 807 (1st Cir.1995)

[100] 17 U.S.C. § 102(b).

[101] 49 F.3d at 817.

[102] Lotus Dev. Corp. v. Borland Int'l, 516 U.S. 233 (1996)

[103] Computer Assocs. Int'l v. Altai, 982 F.2d 693, 706 (2d Cir. 1992); *see also* Gates Rubber Co. v. Bando Chem. Indus., 9 F.3d 823, 834 (10th Cir. 1993); Apple Computer v. Microsoft Corp., 35 F.3d 1435, 1445-46 (9th Cir.1994).

with a particular type of computer program.[104]

While the rule is helpful in theory, it provides too little guidance in practice. It does not help courts decide what to abstract or what to filter. Consider, for example, the competing desktop motifs in *Apple v. Microsoft*.[105] The court ruled that the use of a desktop motif in general was an unprotectable idea, but that a particular creative way of organizing a computer screen to look like a desktop was expressive creativity.[106] It is not clear why a desktop should have been considered an idea, though, because desktop organization of computers was not standard at the time Apple implemented it, and it had little relation to computer operation at that time.

In fact, the court did rule that HP could not use Apple's particular depiction of the trash can,[107] which may be why Microsoft uses the recycle bin today. But the trash can could have been a separate level of abstraction; once one accepts a desktop motif, it is not unreasonable to include a trash can. And once inclusion of a trash can is considered an unprotected idea, one would expect that trash cans will look similar.[108]

These examples show how difficult it is for courts to define and apply *ex ante* rules. The cases appear to either overprotect or underprotect copyrighted expression. Where the cases apply a standard, the standard provides weak guidance.

B. Descriptive and Normative Application

Given the apparent inability to prescribe consistent rules or easily applied standards, courts are left to apply the law as well as they can. The question is how they do so. The analysis presented here, seeks to explain

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[104] Incredible Techs., Inc. v. Virtual Techs., Inc., 400 F.3d 1007, 1015 (7th Cir. 2005) ("[G]olf is not a game subject to totally "fanciful presentation." In presenting a realistic video golf game, one would, by definition, need golf courses, clubs, a selection menu, a golfer, a wind meter, etc. Sand traps and water hazards are a fact of life for golfers, real and virtual.").

[105] 35 F.3d at 1443.

[106] Id. ("Apple cannot get patent-like protection for the idea of a graphical user interface, or idea of a desktop metaphor which concededly came from Xerox. It can, and did, put those ideas together creatively with animation, overlapping windows, and well-designed icons; but it licensed the visual displays which resulted.").

[107] Apple Computer v. Microsoft Corp., 821 F. Supp. 616, 622 (N.D. Cal. 1993) ("Like the garbage icons in the Macintosh and Lisa, the 'Waste Basket' icon in [HP's] NewWave Developer's Release is depicted as an outdoor alley-style cylindrical garbage can with a lid and a handle on the top. Although the [HP] garbage can … does not have vertical lines to indicate a fluted surface or a handle, a trier of fact could reasonably find substantial similarity between it and the garbage icons in Apple's works.").

[108] Herbert Rosenthal Jewelry Corp. v. Kalpakian, 446 F.2d 738, 742 (9th Cir. 1971) (holding that similarities in jewelry shaped like bees were due to bee similarities, and not infringing).

how the courts have (and continue to) resolve difficult computer software reuse questions.

As such, the analysis is primarily descriptive – it identifies the factors that courts apply, even if those factors are not technically part of the rules or standards. Instead, once these factors are present, courts will apply the rules and standards available to achieve the right outcome.

Despite the admittedly backward looking nature, I believe that the factors identified here are predictive of how courts will behave in the future. I also believe that they are normatively justified, and *should* be applied even if I am wrong as a descriptive matter.

The obvious objection here is that it is easy to explain an economic theory in hindsight to fit the facts of the cases, and that does not mean it is normatively justified. This analysis, like others, is open to that criticism.

But this analysis is different in one key respect. Rather than starting by explaining the past, it considers the future. In other words, as discussed below, courts are concerned with the past and the future. The analysis is based on normative suppositions. While one may argue that such suppositions are wrong, one cannot argue that they are based solely on a descriptive aggregation of the cases. Instead, the cases fit the social welfare we would expect to see given different decisions. For this reason, the analysis shows that *Whelan*, a case that is universally reviled as wrong, was normatively justified based on the theory.

Thus, the analysis is descriptive of past activities, but is also supported by sufficient welfare maximization theory and sufficient predictive power to serve as a normative basis for the future.

C. *Intermediate (or Delayed Ex Ante) Optimization and Dynamic Efficiency*

The analysis diverges from some traditional assumptions, however. It assumes that courts maximize social welfare based on the facts before them, in a sort of delayed ex ante analysis. Thus courts will consider the relationship of the parties, the importance of the software, the number of users affected, and other such information to ensure society is better off.

This may not appear unusual, but it is. Traditional analysis implies that courts attempt to set rules to maximize social benefit from an ex ante perspective, without regard to the specific dispute at hand. Under a pure ex ante model, courts should subject themselves to a veil of ignorance, choosing the law that will lead to the best outcomes before either has written any software code at all. Some call this dynamic efficiency: consideration of efficiency at many points in time, rather than ex post.

The analysis here is not quite ex post, though, and attempts to maintain

dynamic efficiency considerations. An ex post analysis would begin the analysis at the time of the lawsuit, at a time when all information was revealed and no information could change future behavior. Instead, here the intermediate time period is measured just before the reuser makes the decision to reuse. In other words, the court considers what came before the reuse, but still sets rules that might affect the behavior of the reuser given how the world has treated the original work. Thus, the analysis is interchangeably considered intermediate or delayed ex ante.[109]

The difference between the ex ante and intermediate approach is exemplified by *Gracen v. Bradford Exchange*,[110] in which the court denied copyright protection to a plate depicting scenes from the Wizard of Oz. Judge Posner ruled that because administrative costs are high in determining whether a second plate copied from the original plate or from the movie, the original plate should be denied protection.[111] Using intermediate analysis, however, a court would recognize that in *this* case, the defendant knew that Gracen made the plate, and *deliberately copied* the original plate without paying her;[112] there were no administrative costs at all at the time Bradford Exchange decided to reuse the work. Social welfare – of a different kind – would be maximized, based on the facts before the court before the decision to reuse.

Posner's outcome was arguably efficient ex ante because the author would in general get paid for her work and would have an incentive to create, even if copyright did not inhere. Further, a small incentive is all that would be necessary because of the small degree of creativity required. In addition, the administrative cost of determining the original elements for copyright protection in derivative works based on live people, photographs, or motion pictures would be high in most cases.

Under intermediate analysis, however, the judge would note that in this case the author did *not* get paid for her work, and therefore it would improve the welfare to require payment for the reuse; otherwise, people might stop creating new designs that might simply be copied without reward. Also, the administrative costs described above did not even exist in the case at bar, as copying was virtually admitted. Finding infringement would have been dynamically efficient because it would have created future incentives to not breach economic relationships with little offsetting administrative or other social costs.

Gracen is an extreme example of ex ante analysis making a rule that is

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[109] My prior article used the term "ex post" as a term of art, but I opt for the more accurate terminology here.

[110] 698 F2d 300 (7th Cir 1983).

[111] Id. at 304-05.

[112] Id. at 301-02.

ostensibly efficient for all cases in the future, on average, without regard to the current case.[113] Delayed ex ante consideration will often lead to conclusions similar to the pure ex ante analysis, but a focus on the facts at the time of reuse may also allow a focus on "unexpected" behavior that might occur after the first work is created.

In short, the analysis focuses on facts that are unknown before creation of the first work, but are important and known at the time reuse occurs. As discussed further below, what happens after the first product is released is critical to the analysis.

A key question is why the generalizations do not simply lead to new ex ante rules that affect incentives to create. To some extent, they do. Knowing each of the factors will guide initial decisions about both how much to create and how much to reuse. The reuse allowed by the analysis will certainly affect the costs and benefits of protection at the time the first work is created, and will continue to affect decisions for the creation of followon works.

The factors cannot solely consider ex ante facts, though, because we *also* value reuse. And we cannot know the nature of any reuse until the reuser actually makes the decision to reuse, sometimes long after the first program is created. The decision of what to reuse and how will be based on technical and market considerations that do not develop until long after the first program is sold. Thus, exploring all of the costs and benefits associated with the factors remains impossible until the time just prior to reuse. Because there are two actors, the courts' decisions must consider *both* ex ante incentives to create and ex post incentives to reuse in order to maximize social benefits. After all, every software creator is also a partial reuser of what came before. Despite incorporating additional factual information, dynamic efficiency considerations are maintained.

D. The Factors

Though judicial decision-making can be modeled in a cost and benefit formula,[114] courts don't explicitly apply calculations. Indeed, the rules that courts can apply are limited, and may not explicitly consider the social welfare calculus. But the combination of rules available give courts tools to reach appropriate outcomes, even if they are not doing so explicitly.

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[113] Indeed, the Seventh Circuit has all but repudiated *Gracen* since *Computer Software Reuse* was published. Schrock v. Learning Curve Int'l, Inc., 586 F.3d 513, 516 (7th Cir. 2009) ("[*Gracen*] should not be understood to require a heightened standard of originality for copyright in a derivative work.").

[114] *Computer Software Reuse* presents the full model, including a more complex mathematical description in the footnotes. Risch, *supra* note 2, at 524 n. 62.

Furthermore, while each case is different, trends do emerge. The goal of this section is to identify and discuss several economic factors that might affect judicial analysis. These factors make some assumptions about costs and benefits associated with each factor. Of course, courts faced with actual disputes might change their analyses where the factors do not cleanly apply.

Courts should and do consider at least four factors when deciding whether software should be reused. First, they consider market substitution. Second, they consider customer need for compatibility. Third, they consider competitive need for compatibility. Fourth, they consider the breach of an economic relationship.

In each of these factors societal benefits are either increased or decreased, and the costs and benefits to the parties are roughly equal because there is a wealth transfer. This is a good thing. Because each case affects societal benefits, it is that much more important to be able to distinguish cases (or fact patterns within a case) where societal benefits increase and where societal benefits decrease. The factor based analysis becomes even more important when multiple factors appear in the same case, as factors might offset each other.

1. Market Substitution

Where the reuse is intended to substituted directly for the original in the marketplace, courts will be less likely to allow the reuse; the closer to 1:1 the substitution is, the more likely reuse will be barred.

Here, the first producer will be worse off due to profits taken by the reuser. On the other hand, the reuser will be better off having taken some of the market. Indeed, the reuser may gain even more than the original producer loses depending on how much value the new product adds in the market.

In other words, at worst, there is a direct wealth transfer from the producer to the reuser. There is some benefit to the reuser that exceeds the loss to the producer. This is because the reuser adds value, which enhances benefits. Further, as the reuser adds more value, the loss to the producer is less due to reuse and more to competition. In short, the more new value added by the reuser, the more increased private benefits there will be (and the more likely reuse will be allowed).[115]

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[115] *See, e.g.*, Sony Comp. Ent. Inc. v. Connectix Corp., 203 F.3d 596, 607 (9th Cir. 2000) ("The district court found that '[t]o the extent that such a substitution [of Connectix's Virtual Game Station for Sony PlayStation console] occurs, Sony will lose console sales and profits.' [] We recognize that this may be so. But because the Virtual Game Station is transformative, and does not merely supplant the PlayStation console, the Virtual Game Station is a legitimate competitor in the market for platforms on which Sony and Sony-licensed games can be played.").

Societal benefits are ambiguous depending on the amount of substitution. Dynamic efficiency implies that some benefits will decrease due to decreased incentive to create caused by decreased profits if reuse is generally allowed. However, an offsetting societal gain may be due to increased competition and the innovation that follows new creation. The more the substitution, the more incentives decrease and the smaller the benefit from competition.

On the whole, to the extent that societal and producer benefits decrease more than benefits increase for the reuser, the court will disallow reuse. For this reason, courts are far more likely to bar slavish copying, and more likely to allow reuse that adds new value or does not constitute a direct substitution.

2. Customer Need for Compatibility

Courts allow reuse if many customers would benefit from the reuse or be harmed by its disallowance. This factor is driven by intermediate analysis, because customer needs cannot be known at the time the original work is created.[116] In short, market success leads to customer reliance, and limited reuse of key elements may improve social welfare. Thus, the functionality associated with this factor will relate primarily to ergonomics and operations.

Considering customer needs does not sacrifice dynamic efficiency. As long as slavish copying of an entire program is disallowed, this factor still ensures that companies recoup their investment in the first software program. They will, of course, make investment decisions that consider the probability that some program elements will lose protection due to customer needs. Thus, the investment in each program may decrease, but the ability for new program authors to compete and add new features by reusing certain elements offsets this decrease. A court should only reduce the protection if customer/societal interests would actually be served by reducing protection.

One area where this factor will arise is with de facto standards. A product becomes a "de facto" standard when virtually everyone uses it regardles of approval by some governing body.[117] Such standards are

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[116] Kenneth W. Dam, *Some Economic Considerations in the Intellectual Property Protection of Software*, 24 J. Legal Stud. 321, 351 (1995).

[117] Janice M. Mueller, *Patent Misuse Through Capture of Industry Standards*, 17 BERKELEY TECH. L.J. 623, 633 (2002) ("De facto standards are not promulgated by a particular body, but arise spontaneously due to marketplace success."); David A. Balto, *Standard Setting in a Network Economy* (Feb. 17, 2000) ("Although standard setting case law is almost exclusively devoted to the activities of standard setting associations, competition principles apply equally to situations in which a dominant firm sets a de facto

peculiar because market leads are transient. By the time a dispute is adjudicated, the market lead may be gone while the standard remains.[118]

The question is whether there exists a trademark-like "policing" duty that the first creator must perform to keep a program element from becoming an industry standard, or whether a program element is so important that courts will allow reuse whether or not the element has been "policed."[119]

The "customer compatibility needs" factor allows courts to assess–at any time during the first product's life cycle–when an element should cease to be protected and when it may be used by other programmers. At this point in time, the creator would no longer be able to rely on the product's "momentum" and others would be able to use certain elements.[120] It may be, like many generic trademarks, that early on in a product's life, the element is protected but later on the element may be reused.

As with substitution, producers will lose some benefits due to market substitution for the new product. Assuming no slavish copying, though, private gains to the reuser should be positive and outweigh the producer's loss due to the reuser's ability to break into a market that would otherwise be captured by the producer's product.

With respect to social welfare, there may be some reduction due to a lack of incentive to create. The decrease attributable directly to the law should not be large, however, because the loss to producers caused solely by the reuse (rather than competition) is arguably relatively small if the original software is so popular that customers would benefit from reuse.[121]

Because this factor includes switching costs, we would expect social costs to decrease (and welfare to rise) due to lower switching costs. Another aspect of social welfare might increase due to greater competition and incentive to innovate by reusers, in addition to more customers who are

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standard and abuses its subsequent market power through exclusionary acts such as monopoly leveraging,"), http://www.ftc.gov/speeches/other/standardsetting.shtm.

[118]Patry, *supra*, note 93, at 8 n37 (noting that by the time of the *Lotus v. Borland* decision relating to reuse of menu structure, Lotus was no longer the substantial market leader it had once been.).

[119] Of course, a further question is whether design patents change the calculus, as discussed below.

[120]Timothy S. Teter, Note, *Merger and Machines: An Analysis of the Pro-Compatibility Trend in Computer Software Copyright Cases*, 45 STAN. L. REV. 1061, 1072 (1993); Joseph Farrell, *Standardization and Intellectual Property*, 30 JURIMET. J. 35, 36 (1989).

[121]Lawrence D. Graham and Richard O. Zerbe, Jr., *Economically Efficient Treatment of Computer Software: Reverse Engineering, Protection and Disclosure*, 22 RUTGERS COMP. & TECH. L.J. 61, 125 (1996) (noting broad approval of reverse engineering when monopoly profits are large).

better able to choose programs that meet their needs.[122] In addition, the potential for new competition might drive the initial provider to develop new software rather than simply rely on its prior work.

Additionally, social costs might be affected by the standards aspects of any program. The costs may be high or low, depending on the quality of the pre-existing program. If the program is of high quality, then the increase in social costs will be low by allowing reuse; allowing more people to use high quality software features is a social good. Indeed, barring reuse may actually create social costs.[123] However, if the program quality is low, then the increase in social costs could be high; allowing reuse will not create incentives to create improved technology, and more customers will use inferior technology.[124] While there is disagreement on this issue,[125] partial reuse for customer compatibility indicates that the increase in social costs would be small, because new software manufacturers will be allowed only to reuse the elements necessary to keep customer costs low, but reusers would otherwise add functionality in order to obtain future customers.

In the aggregate, the gain in social benefit and the decrease in social cost should outweigh the sometimes administratively costly determination of whether customer needs for compatibility justify limited protection for certain elements.[126] On the whole, social benefits are increased greatly, switching costs are reduced (to varying degrees), other social costs may increase slightly, and benefits gained by the reuser outweigh a loss in benefits to the producer. Thus, in most cases where there is a customer need for compatibility, courts will allow reuse.

3. Competitive Need for Compatibility

The fourth factor assesses the competitive need for compatibility. This factor relates more to operation functionality reuse of ideas than to ergonomics. The factor is directly driven by the need for software programs to communicate with other programs, to work on a particular hardware

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[122]*Id.*

[123]Nicolas P. Terry, *GUI Wars: The Windows Litigation and the Continuing Decline of Look and Feel*, 47 ARK. L. REV. 93, 132 (1994).

[124]Joseph Farrell, *Standardization and Intellectual Property*, 30 JURIMET. J. 35, 46 (1989) (excessive dissemination means that an inferior standard may capture the market).

[125] Compare Farell, *Id.*, with Peter S. Menell, *An Analysis of the Scope of Copyright Protection for Application Programs*, 41 STAN. L. REV. 1045, 1068 (1989) (broad copyright protection may lead companies to adopt incompatible and non-efficient standards to avoid reuse) and Matthew P. Larvick, Note, *Questioning the Necessity of Copyright Protection for Software Interfaces*, 1994 U. ILL. L. REV. 187, 211-12 (1994) (limited or no protection for user interfaces will not "freeze" current interfaces into static standards).

[126] Teter, *supra* note 120, at 1072.

platform, or to provide features expected of a particular type of device.

The factor is similar to the trade dress notion of functionality: to the extent that software looks similar because of functional requirements, the reuser will not be held liable for copyright infringement.[127] However, for copyright, this factor usually relates to unseen portions of programs. Its potential application to design patents will follow in a later section.

Some argue that competitive compatibility is simply a pretext for cheaply taking profits rightly earned by the first author's original creation.[128] The pretext argument fails economic analysis, however.[129] Companies that must copy in order to compete under this factor will usually attempt to license the technology because it is less expensive and more expedient than reverse engineering and protracted legal battles.[130] Because one company owns the technology another is trying to license, however, hold-up costs arise, which make voluntary and efficient transactions more difficult to achieve. The courts must resolve such market failures.

As with the other factors, the reuser gains while the producer loses, and they roughly offset each other at least. Here, too, the gains to the reuser should exceed the loss to the producer based on increased competition and value added to the second program. Of course, the more elements of a program that are reused, the more equal redistribution of benefits becomes.

Social welfare should increase due to increased competition and increased value to computer program users.[131] The story is not complete, there, though. Society should expect some decreased incentives to create by the original developer. The decrease in social benefits is likely outweighed by the gained benefits of increased competition and added value in reuse,

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[127] Bonito Boats, Inc. v. Thunder Craft Boats, Inc., 489 U.S. 141, 148-49 (1989) (holding that the patent system alone governs copying of ideas and functional elements); Inwood Labs., Inc. v. Ives Labs., Inc., 456 U.S. 844, 853 (1982) (affirming finding that color of medicine was functional).

[128]Christopher Hager, Note, *Apples & Oranges: Reverse Engineering as a Fair Use After* Atari v. Nintendo *and* Sega v. Accolade, 20 RUTGERS COMPUTER AND TECH. L. J. 259, 320 (1994) ("[T]heir true objectives were to cash in on commercial markets established by the plaintiffs . . . .").

[129]David A. Rice, Sega *and Beyond: A Beacon for Fair Use Analysis . . . At Least as Far as It Goes*, 19 DAYTON L. REV. 1131, 1146 (1994) ("The Ninth Circuit concluded, however, that the public benefit resulting from a commercial use is a factor worthy of consideration even if the objective and consequences of the use is economic gain").

[130]Lauren Bruzzone, Note, *Copyright and License Protection for Computer Programs: A Market Oriented Assessment*, 11 PACE L. REV. 303, 314 (1991). Indeed, Google attempted to license Java from Sun, but the fee was so high (and time limited) that it was apparently cheaper to write a compatible version. James Niccolai, *Google: Sun Offered to License Java for $100 million*, NETWORK WORLD (July 22, 2011), http://www.networkworld.com/news/2011/072211-google-sun-offered-to-license.html.

[131]Teter, *supra* note 120, at 1063-71.

but it is a consideration nonetheless.

Like the customer needs factor, it is also possible that societal costs will increase greatly due to widespread dissemination of an inferior standard.[132] On the other hand, however, if the court examines which elements are truly necessary to compete and allows reuse of only those elements, then it is likely that technology will advance due to new elements added by the reuser. Because the primary benefit of this factor is market entry, it is reasonable to expect that new competitors that do not slavishly copy will add new program elements in order to actually make a profit.

4. Breach of an Economic Relationship

If the reuser breaches an economic relationship with the original software creator, then courts will be less likely to allow the reuse. This economic relationship might be a contract or an employment relationship.

Here, the original would see costs associated with the economic breach. In copyright, these costs could be quite large if source code is involved. This loss is transferred to the reuser, who sees a benefit that might even exceed the loss to the producer. If the reuser gained less than the producer lost, then ordinary contract remedies, if available, might be sufficient to deter breach. Furthermore, where there is a prior economic relationship— that is, where the reuser knew about the prior work and breached an obligation by reusing it—one would expect that the reuser would only do so if it expected large gains.

Breaching economic relationships reduces social welfare because it reduces incentive to contract or create where obligations may be breached. From a software reuse perspective this is the most important consideration of this factor. Many works are created based on promises, and if reuse is allow without payment, then fewer works might be created. This would be bad for society.

This factor is the reason why *Whelan v. Jaslow* was normatively the right outcome, despite its critics. However, because of this factor's limited application to design patents (except those involving prior economic relationships), it is included here primarily for completeness.

IV. APPLYING THE ANALYSIS TO DESIGN PATENTS

Though the economic analysis works quite well with copyrighted

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[132] Christopher A. Cotropia & James Gibson, *The Upside of Intellectual Property's Downside*, 57 UCLA L. REV. 921, 923 (2010) ("If so, then the usual story gets reversed: We should grant protection when - indeed, because - its net effect is to discourage innovation in a disfavored industry.").

software,[133] the design patent is a different animal. Consideration of those differences is appropriate to determine whether economic principles from copyright should even apply.

Assuming the analysis does apply, there are two primary ways that courts can act as gatekeepers to maximize social welfare relating to GUI design patents. The first is the determination of whether a design is ornamental or functional. The second is determining which infringement arguments are allowed by the court—filtration.

Courts should embrace this gatekeeping role for design patents and consider social welfare. They should do so, even if implicitly; they are certainly not doing it now.

I make no claim that these analogies hold true for all of design patent law, though they might. For graphical user interfaces, however, design protection is very similar to copyright protection with respect to functionality and infringement. This section addresses each facet in turn.

A. *Design Patent and Copyright Differences*

1. Functional Differences

Unlike copyrights, design patents are examined by the PTO prior to issuance, and theoretically claim only novel and non-obvious design elements. This is a critical difference: it would be better to address concerns during examination if possible rather than wait until an infringement action. To be sure, there is an *in terrorem* effect associated with the mere existence of design patents, but the economic analysis here assumes that ship has sailed. Part II discusses the importance of allowing fewer patents, but this part assumes that the Court takes the dispute as it finds it. Even so, all is not lost; after all, the volume of copyright GUI cases decreased significantly as legal principles settled and judicial treatment of interfaces became expected. There is no reason to believe that the design patents would be any different.

Aside from examination, there are important differences associated in copyright and patent protection. For example, design patents do not allow for independent development. Copyright law allows for independently developed versions of even identical designs.

Further, copyrights typically cover entire computer programs. This might include the entire user interface, the entire source code, and other program elements. Design patents only claim discrete elements of the GUI. However, copyright *lawsuits* rarely relate to the entire user interface; every important case involved the arrangement of a few elements, the so-called

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[133] *See, e.g.,* Risch, *supra* note 3. Though hardly a provable assertion, I recall telling colleagues that *Napster* would never be considered a fair use based on the factors.

"look and feel."

Finally, there is little room for a court to modulate the level of protection that a design patent offers. Unlike copyright, which offers numerous ways a court might reduce protection, a design patent is either valid or invalid, and it is either infringed or non-infringed.

2. Conceptual Differences

More conceptually, copyright and patent should be protecting two different things. Despite pretextual protection of "expression," copyright has historically been used to protect functionality. The key cases discussed above, *Lotus v. Borland*, *Whelan v. Jaslow*, and *Computer Associates v. Altai*, were all about protection of the operable aspects of the program, not the static graphical screens. In each case, the structure, sequence, and organization of the user interface was combined with the remainder of the program to create a functional whole.

As such, the abstraction, filtration, and comparison efforts were an attempt to determine which functions (and how they were triggered on the screen) could be owned by the original maker and which could be reused.

Design patents, on the other hand, are supposed to protect only the design of the software. Even if there were to be some filtration, the comparison should be to copyright's "useful article" doctrine, which limits copyright protection of useful graphical works only to the non-functional aspects. The problem is that the test for separating functionality from expression in copyright is a mess generally,[134] and was basically abandoned in computer software.

Consider, for example, this short quote from *Lotus Dev. Corp. v. Borland Int'l*:[135]

> Whatever expression there may be in the arrangement of the parts of a VCR is not capable of existing separately from the VCR itself, so an ordinary VCR would not be copyrightable. Computer programs, unlike VCRs, are copyrightable as "literary works." Accordingly, one might argue, the "buttons" used to operate a computer program are not like the buttons used to operate a VCR, for they are not subject to a useful-article exception. The response, of course, is that the arrangement of buttons on a VCR would not be copyrightable even without a useful-article exception, because the buttons are an uncopyrightable "method of operation."[136]

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[134] *See*, McKenna & Sandburg, *supra* note 47.
[135] 49 F.3d 807 (1995).
[136] Id. at 817 (citation omitted).

This short segment a) improperly applied the useful article doctrine with respect to the VCR (the buttons are surely separable from the VCR); b) incorrectly implied that the doctrine would not apply to software (but GUIs are graphical works); and c) then abandoned the doctrine for method of operation analysis.

This does not bode well for a similar "separability" analysis for GUI design patents.

3. Reconciling the Differences

The question remains, then, whether design patent rules are best informed by economic analysis that might otherwise apply to copyright.

The answer to that question is yes. There may be differences, but those differences are at the doctrinal, not welfare maximization level. Even the conceptual differences discussed above are really about which doctrine to apply. But there is no law that says the doctrines used to maximize welfare for design patents must match the doctrines used to maximize welfare for copyrights. An important feature of the analysis is that courts do not know that they are using it; instead, they instinctually use whatever tools they have to maximize welfare. So, if conceptual separability is a failure for copyright, and design patents allows for some form of filtration, then courts should choose filter rather than separate.

The economic analogies hold true even if one disbelieves the normative assumptions of the economic considerations presented here. For example, if one believes that more protection would better incentivize creation, the same would be true of both copyright and design patent. If one believed that less protection would better serve the public interest, the same would still be true of both. The courts should apply the tools available to reach the best level; I think my factors are sufficient, but others may supplement or replace the factors as they see fit.

Even though design patents are different from copyright in many ways, the economic factors affecting graphical user interface design patent protection are very similar to the factors affecting copyright protection when it comes to functionality and infringement.[137] Such patents are about surface ornamentation, after all. Functionality in design patent law is analogous to the idea/expression dichotomy in copyright law. Abstraction and filtration in design patent law could be analogous to abstraction and filtration in copyright law.

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[137] Mark A. Lemley & David W. O'Brien, *Encouraging Software Reuse*, 49 STAN. L. REV. 255, 296-98 (1997) (discussing how patent protection can lead to market in reusable software components).

B. Ornamentality/Functionality

As discussed above, design patents are intended for ornamental product designs that are not functional. If a design is solely functional, then it must be protected, if at all, by a utility patent. However, courts rarely make distinctions about different types of functionality, and they have long held that where functionality and ornamentality mix, a design patent may issue so long as the design is not dictated by functionality.[138] The number of cases invalidating patents is far outweighed by the number of cases allowing them.[139]

The law currently includes few limitations on patenting. Federal Circuit precedent allows design patents that incorporate functional elements, unless the design embodies the function or unless the function is necessary to compete in the market.[140] But design patents do not have a "market," making the test difficult. Designs that might be functional in one context, say a key blade designed to fit a type of lock,[141] becomes completely ornamental when hung as a necklace pendant or used as a (dangerous) toy.[142] Determinations of functionality in a market must depend, at least in part, on how the product will be used.[143] Patentees can almost always point

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[138] In re Koehring, 37 F.2d 421, 424 (C.C.P.A. 1930) (holding that utilitarian objects may be protected with design patents, so long as someone cares about their ornamentation); Robert W. Brown & Co. v. De Bell, 243 F.2d 200, 202-203 (9th Cir. 1957) ("While it is the design which is patented, it is immaterial that the subject of the design may embody a functional or utilitarian purpose."); In re Carletti, 328 F.2d 1020, 1022 (C.C.P.A. 1964); L.A. Gear, Inc. v. Thom McAn Shoe Co., 988 F.2d 1117, 1123 (Fed. Cir. 1993); Hupp v. Siroflex of Am., Inc., 122 F.3d 1456, 1460-61 (Fed. Cir. 1997) (design of concrete stamp ornamental, even though its sole function is to stamp concrete of the same shape).

[139] *See also* Du Mont & Janis, *Virtual Designs*, *supra* note 41, at *46 (finding one rejection for functionality among *all* GUI patents since 1996).

[140] Best Lock Corp. v. Ilco Unican Corp., 94 F.3d 1563, 1566 (Fed. Cir. 1996) (design of key blade functional because no other shape would work in lock); Avia Group Int'l, Inc. v. L.A. Gear Cal., 853 F.2d 1557, 1563 (Fed. Cir. 1988); L.A. Gear, Inc. v. Thom McAn Shoe Co., 988 F.2d 1117, 1123 (Fed. Cir. 1993) ("If the particular design is essential to the use of the article, it can not be the subject of a design patent.").

[141] *Best Lock*, 94 F.3d at 1566.

[142] *See, e.g.,* Du Mont & Janis, *Virtual Designs*, *supra* note 41, at *60 (t-shirt can infringe GUI patent since patent covers only the image and is not limited to a display screen). Consider Irwin Mainway's Bag o' Glass and Chainsaw Teddy Bear, both of which have dual function/playtime uses. *Consumer Probe*, SATURDAY NIGHT LIVE (Dec. 11, 1976), http://snltranscripts.jt.org/76/76jconsumerprobe.phtml and http://www.hulu.com/watch/115713.

[143] 37 CFR § 1.153 requires that the title and claim each identify the article of manufacture. However, broad leeway is given to describe use of the article, so long as it is clear what the article is. MPEP § 1503.1 ¶ 15.05 ("An acceptable title would be 'door for cabinets, houses, or the like,' while the title 'door or the like' would be unacceptable. . . .").

to some ornamental aspect that is unrelated to a particular use.

Thus, the functionality rule may not strike the right balance that allows patenting on ornamentality but not functionality. After all, a court must first find that the design incorporates a functional element at all, and courts may disagree on what GUI elements are functional rather than ornamental.[144] Additionally, if design alternatives exist, courts will not find functionality,[145] presumably even if all the alternatives are patented. This is a distinct departure from copyright, where few design alternatives will bar protection. Further, the defendant must prove functionality by clear and convincing evidence.[146]

As a result, a combination of elements, each of which might serve some utilitarian purpose, can be protected as a group if the design in the entirety is primarily ornamental rather than functional.[147]

But courts need not allow such patents. Intermediate analysis might strike a different balance. A design that is ornamental when conceived may become functional years later, as technology expands and changes. Indeed, some designs may be functional when originally conceived, and become ornamental as time passes; for example, images of floppy disks used to denote saving data are less functional today than they were in 1995.

Two examples illustrate how an ex post approach to functionality might be illuminated by the economic factors.[148] The first is D457,164,[149] which

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Thus, "Key Design for locks, necklaces, or toys" would be acceptable.

[144] Du Mont & Janis, *Virtual Designs*, *supra* note 41, at *34 (expressing surprise at the number of utility patents cited as prior art in design patents).

[145] Hupp, 122 F.3d at 1460-61; Avia, 853 F.2d at 1563; Thom McAn, 988 F.2d at 1123. *See, e.g.*, Order Granting in Part and Denying in Part Motion for Judgment as a Matter of Law, Apple, Inc. v. Samsung Elec. Co. Ltd., Case No. Case No.: 11-CV-01846-LHK, at p. 4 (Document 2220, Jan. 29, 2013) (ruling that jury need not have been instructed about functional elements, because alternate designs were available).

[146] L.A. Gear, Inc. v. Thom McAn Shoe Co., 988 F.2d 1117, 1123 (Fed. Cir. 1993). Presumably, the examiner could reject functional designs using a lower evidentiary standard, but this virtually never happens.

[147] 988 F.2d at 1123. *See also,* Lee v. Dayton–Hudson Corp., 838 F.2d 1186, 1189 (Fed.Cir.1988). *But see*, Barofsky v. Gen. Elec. Corp., 396 F.2d 340, 344 (9th Cir. 1968) ("[B]ecause the dominant features of the design [for a cabinet door], and therefore the design as a whole, are primarily functional, this is not a valid design patent.").

[148] Most of the examples presented relate to Apple, Inc., design patents. This is not accidental; Apple has protected its user interfaces with design patents in a highly visible way though, notably, in 2012 it was granted half as many design patents as Microsoft and fewer than even RIM (Blackberry). James Juo, *Design Patent Prosecution*, DESIGN PATENTS IN THE MODERN WORLD, at 3 (Conference Proceedings, Apr. 5, 2013) http://www.law.stanford.edu/sites/default/files/event/322028/media/slspublic/final_new_pp tx_658586_1-full_size-op-1.pdf. *See also* Du Mont & Janis, *Virtual Designs*, *supra* note 41, at *26 (noting that Microsoft is responsible for most of the growth of GUI design patents).

shows an expanding application window. One image is reproduced below, but the patent claims the entire expansion[150] of the window from nothing to a rectangular window.

At the time this patent was filed, 2000, the idea of animated window expansion was known, but the particular animation associated with Apple's design may have been more ornamental than functional. There is no functional requirement that window maximization be animated (though it might improve user experience),[151] and there was certainly no functional requirement that windows be expanded in this particular way.

However, as time passes, customers might come to expect this behavior. First, docking of minimized applications at the bottom of the screen is well accepted across operating systems. Second, animated window expansion is commonly used. Third, there are only so many ways for a window to expand from a docked icon to a rectangle. Thus, what was once a nice design might now be a de facto standard.

As such, a court's willingness to protect the design might decrease as the standard becomes entrenched in user expectations. At least one case supports this view of functionality.[152] Drawing on trademark law, the court ruled that design elements are functional if they are essential to the purpose of the article or affect its cost or quality.[153] Using this standard, customer expectations, even of color, might be considered functional.[154]

This implicates three of the factors. First, the substitution is not direct. The animation is not the entire program, but only a piece of it. It is unlikely that software companies will stop developing graphical user interfaces, nor even new expansion animations, if some reuse were allowed. This factor may not favor reuse, but it does not necessarily weigh against reuse. Second, if this were a de facto standard, then the customer need for compatibility would favor reuse. Third, if there are only a few ways to expand a window, then the competitive need for compatibility might favor reuse.

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[149] Filed Jan. 5, 2000.

[150] Or minimization, if you are a glass half-empty kind of person. It is important to note that the design is not functional and could apply to either event, so long as they look the same.

[151] WILBERT O. GALITZ, THE ESSENTIAL GUIDE TO USER INTERFACE DESIGN: AN INTRODUCTION TO GUI DESIGN PRINCIPLES AND TECHNIQUES 682 (3d ed. 2007) ("The changing of states of an element with two or more states will be easier to understand if the transitions are animated instead of being instantaneous.").

[152] Amini Innovation Corp. v. Anthony Cal., Inc., 439 F.3d 1365 (Fed. Cir. 2006).

[153] Id. at 1371.

[154] *Cf.* Inwood Labs., Inc. v. Ives Labs., Inc., 456 U.S. 844, 853 (1982) (affirming finding that color of medicine is functional).
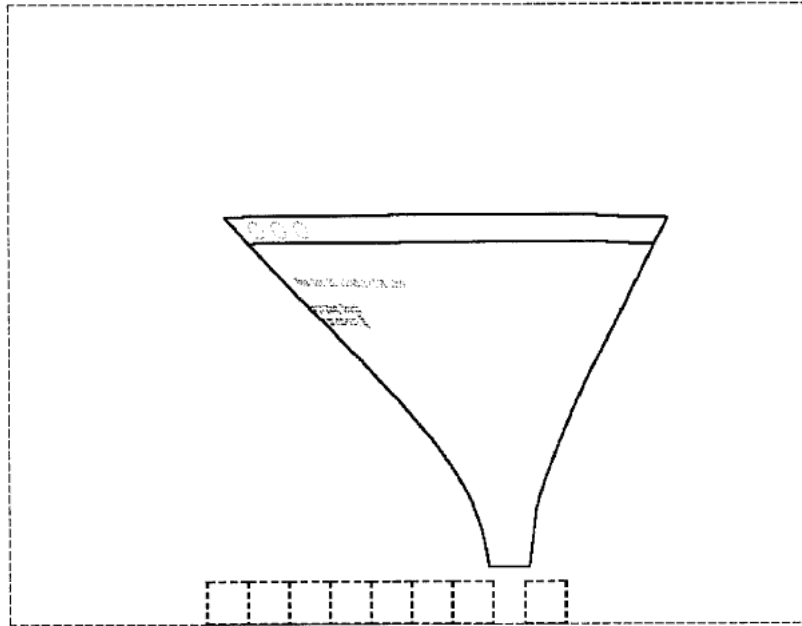
Another example is Patent No. D670,713,[155] claiming page turning animation. Here, the patent is newer, so the functionality implication is less reliant the passage of time. In this case, the functionality concern is two-fold. First, the animation looks a lot like a book page turning. That is the point of the design, of course: simulating a book page turn on a display screen looks nice.
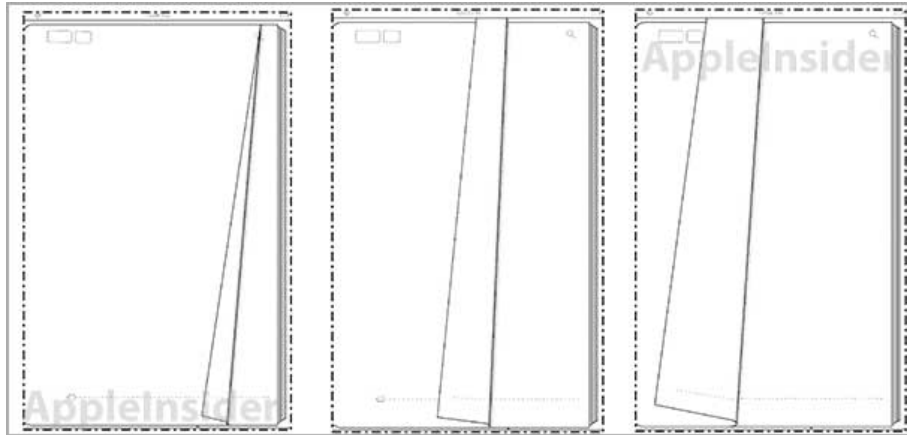
However, if the design simulates reality then it is, in a sense, dictated by functional concerns – the way a book might look. Closely related to this is that there may be limited ways to simulate a book page turn, so that

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[155] Filed Dec. 19, 2011.

competitive needs for functionality might reign. The factors apply in much the same way in this case.

Even if the entire design is not dictated by functionality under current law's requirements to bar a design patent, there are two ways that courts might consider functionality in designs like the page turning book. The first is obviousness. If the design looks like something in the real world, then perhaps the design is obvious.[156] Despite the good sense of this approach,[157] current law disfavors this type of obviousness consideration by the court as a gatekeeper. First, many district courts have divested themselves of any gatekeeping factual analysis in obviousness cases, leaving everything to the jury.[158] Second, as discussed above, obviousness rules in design patents are extremely permissive, so courts and the PTO do not reject patents. However, more rigorous nonobviousness requirements applied to design patents might invalidate functional designs.

A second way to handle functionality would be to allow such patents, but to filter out functional elements or otherwise limit infringement findings. This is consistent with Federal Circuit precedent:

> If the patented design is primarily functional rather than ornamental, the patent is invalid. [] However, when the design also contains ornamental aspects, it is entitled to a design patent whose scope is limited to those aspects alone and does not extend to any functional elements of the claimed article.[159]

For the page turn design, this would mean that a competing design would not infringe merely for implementing a page turning animation. Furthermore, only designs essentially identical to the patented design would infringe. This solution is only palatable if there are many ways to design

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[156] Du Mont & Janis, *Virtual Designs*, *supra* note 41, at *54 (discussing anticipation of computerized daisy by a daisy drawn on flowerpot).

[157] *See, e.g.*, Dann v. Johnson 425 U.S. 219, 227-28 (1976) (holding that known process implemented on a computer is obvious); In re Glavas. 230 F.2d 447, 450 (CCPA 1956) (allowing use of surface ornamentation from any type of product to be considered for design patent obviousness).

[158] *See, e.g.*, Order Granting in Part and Denying in Part Motion for Judgment as a Matter of Law, Apple, Inc. v. Samsung Elec. Co. Ltd., Case No. Case No.: 11-CV-01846-LHK, at p. 5 (Document 2220, Jan. 29, 2013). The court allowed the jury to determine all facts associated with obviousness, but the jury received no special verdict questions about any of the factual questions from which the court could make a legal conclusion, such as the scope of the prior art, differences between the patent and the prior art, the level of skill in the art, or any secondary factors. Instead, the jury's "patent is valid" verdict was assumed to implicitly include all facts necessary to find the patent non-obvious. The court then assumed that all the facts favored obviousness and ruled accordingly.

[159] Richardson v. Stanley Works, Inc., 597 F. 3d 1288, 1293-94 (Fed. Cir. 2010).

page turning animations. The next section considers infringement and filtration of functionality in more detail.

C. Infringement

User interfaces are rarely identical. The test courts use to determine whether they are close enough to infringe is whether an ordinary observer who is familiar with the design and what came before it would think that the accused design is substantially the same.[160] This test has always allowed some equivalents,[161] but proving infringement is not always easy because the prior art must be considered.[162] Indeed, infringement findings appear to be rarer than some might think.[163]

Thus, where the accused GUI is not identical to the patented design, the court must determine the zone of potential infringement. This is a natural gatekeeper function that allows application of the factors. The allowable patent scope for purposes of equivalents might be varied by courts depending on the market substitution, the customer need for compatibility, and competitive need for compatibility.

Consider, for example, Design Patent No. D604,305,[164] owned by Apple, Inc., which is pictured in the introduction. The patent claims a screen for an electronic device with icons presented on it. The icons are square with rounded corners, and they are layered four across. The patent includes a "fixed" row of four icons at the bottom of the screen. In the actual device, we know that these icons—presumably those most favored by the user—remain the same, no matter what screen one looks at. Of course, the patent does not require that the icons stay the same from screen to screen. It only requires the icons to be on a gray background at the bottom.

Samsung developed a competing interface for its smartphones. Apple sued Samsung, and a jury found that Samsung's "Touch Wiz" interface

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[160] Gorham Co. v. White, 81 U.S. (14 Wall.) 511, 528 (1871); Egyptian Goddess, Inc. v. Swisa, Inc., 543 F.3d 665, 670 (Fed. Cir. 2008) (en banc).

[161] Geo. Borgfeldt & Co. v. Weiss, 265 F. 268, 270-71 (2d Cir. 1920) (holding that design patent claiming doll with cap might be infringed by doll with different head dress, including painted hair). Indeed, people often use the dinnerware at issue in *Gorham* as the prime example; there were many differences between the patent and the accused products. Perry Saidman, *U.S. Design Patent Infringement*, DESIGN PATENTS IN THE MODERN WORLD,   at   6   (Conference   Proceedings,   Apr.   5,   2013), http://www.law.stanford.edu/sites/default/files/event/322028/media/slspublic/ENTIRE%20 Post%20EG%20040313-1.pdf.

[162] *See, e.g.*, images of the patent, accused product, and prior art at issue in *Egyptian Goddess*, in which no infringement was found, despite apparent equivalence. Juo, supra note 148, at 8.

[163] Saidmain, *supra* note 161, at 24.

[164] Filed June 23, 2007.

infringed this design patent.[165]

At the time of patent application filing, 2007, Apple's design might have been ornamental and not dictated by functionality. After all, the look of the screen does not do anything when viewed. Furthermore, icons need not be rounded, and the icons at the bottom need not have a different color. At a time when few other devices had a touch-screen that would accommodate finger taps and gestures, the combination of elements on this screen may have been an "ornamental design for an article of manufacture."[166]

This was especially true because the first operable screen the user saw on the Apple iPhone looked much like the drawing in the design patent.[167] Thus, ex ante, the patent may be ornamental/nonfunctional.

This view is charitable, in many respects. Pieces of the design must surely have been driven by functional considerations. The dock is especially troubling, because functionality might dictate a different color for a set of icons that does not change from screen to screen. Because the design patent does not claim any functional features, it presents as if the color is merely ornamental because the context of a working graphical user interface is missing. But any user of the iPhone, indeed any user of computer software, knows better.

The idea of a fixed area using different coloring that held frequently used programs was not terribly new. Microsoft had used something similar since Windows95, and many "quick launch" program docks were available, and those docks were all a different color. RIM had introduced icons in rows on its Blackberry devices years before the iPhone was released,[168] and Nokia had even provided an interface with square icons aligned in rows.[169] Of course, one had to scroll through the icons rather than touch them, but the arrangement only made scrolling easier. And scrolling should be irrelevant, because this is a design patent—only the appearance matters.

Further, Adobe had used square icons with rounded corners for so long

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[165] Apple Inc. v. Samsung Elec. Co., Jury Form, Case No.: 11-CV-01846-LHK (Aug. 24, 2012), http://www.groklaw.net/pdf3/ApplevSamsung-1930.pdf.

[166] 35 U.S.C. § 171.

[167] There are other difficulties with calling this interface layout the "design" of an article. After all, the user controls both the number of icons on the screen and the images on those icons (by changing the applications on the screen).

[168] *RIM BlackBerry 7230*, PCMAG.COM (Oct. 1, 2003), http://www.pcmag.com/article2/0,2817,1265089,00.asp; Du Mont & Janis, *Virtual Designs*, *supra* note 41, at *21 (noting that RIM's design patent for rows of icons is one of the most cited design patents).

[169] *Nokia 6681 review: Extra style*, GSM ARENA (May 8, 2005), http://www.gsmarena.com/nokia_6681-review-38p3.php.

that it abandoned them before Apple even applied for its patent.[170] The federal government had even recommended square icons with rounded corners for icons in vehicle displays.[171]

Even discounting the prior art and purely functional elements, many (many!) consumers grew to know and recognize how to use the Apple's iPhone user interface as a whole, even if they did not own a device themselves. A few short years after introduction, such touch screens were ubiquitous. As smartphone sales grew, companies released competing operating systems.

While square icons with rounded corners and a "dock" of four icons was not required, it was one of only a few functional ways to organize the limited space on a screen.[172] It also allowed consumers to switch from the iPhone to Samsung's Touch Wiz with minimal costs associated with learning of new layout concepts.

Thus, courts should be more inclined to find Apple's design functional *now* even if it was not entirely functional *then*. While Apple saw competing products as nothing more than pilfering of its design to steal customers,[173] the benefits of new entry of competing operating systems encouraged through low switching costs can maximize social benefit. Such designs would not always be functional ex ante, but the later reuse of a de facto standard presents new facts unavailable when the first design is created.

To address the inevitable counter-argument, it is unlikely that earlier creators like Apple would cease to have an incentive to create new designs. To begin, Apple reused elements from the past. Further, Apple did not know which of its user interface elements would become so important that their protection might be limited. Even now, Apple continues to create new designs that will not become standards. It is also possible that the fame of

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[170] Prescott Perez-Fox, *Out with the Old*, PRESCOTT'S DESIGN BLOG (Dec. 17, 2006), http://www.perezfox.com/2006/12/17/out-with-the-old/.

[171] IN-VEHICLE DISPLAY ICONS AND OTHER INFORMATION ELEMENTS: VOLUME I, Publication No. FHWA-RD-03-065, at 4-4 Fig. 4-2 (Sept. 2004), http://www.fhwa.dot.gov/publications/research/safety/03065/03065.pdf.

[172] Indeed, on larger devices like the iPad, the number of docked icons grows. This implies that the number of icons is determined almost exclusively by size, rather than aesthetics. Of course, choosing the right size and spacing may be an important aesthetic design decision; the question is whether one can exclude others from reusing those decisions on devices of nearly identical size and shape.

[173] Apple Inc. v. Samsung Elec. Co., Volume 2 (Trial Transcript), Case No.: 11-CV-01846-LHK (July 31, 2012) ("It meant that apple had invented something that was so unique and innovative that customers would no longer accept the devices that looked and acted -- that didn't have touch screens, for example. Faced with this reality . . . Samsung had two choices: . . . it could come up with its own designs [and] beat Apple fairly in the marketplace; or it could copy Apple."), http://www.groklaw.net/pdf4/ApplevSamsung-1547.pdf.

its design has caused it to *stop* creating improved interface elements despite the need for them.[174] This is why new market entrants are so important.

However, when considering Apple's GUI design, it is difficult to argue that the *entire* design is functional. Only some of the basic ideas and other aspects are functional. For example, courts should not let a competitor reuse the exact icons, in the exact order, of those in the design. This differentiates the iPhone design from the unfolding window or the page turn animation. With the latter animations, the entire design might be considered functional, whereas with the whole GUI the entire design might be protectable, and reuse might be adjusted through infringement considerations. In this sense, the design protection is similar to "thin" copyright protection. It might be protected against direct copying, but not against reuse of the ideas that cause high-level similarities.

And copying of high-level similarities is precisely what Apple argued at trial, and won. The Touch Wiz interface shown in the introduction is not an exact copy of the Apple design. In many ways, it is not even close. The icons are different. They are different colors. They are in a different order, and there are more of them. The background is a different color. The icons that were similar were driven by functional requirements, like the color green, the shape of a handset (which was not new to Apple), and a clock. Though it is technically irrelevant, the functions of the icons on the dock were different. Given these differences, Apple argued that the *idea* of the design was the same. One of the case exhibits is reproduced below; it makes Apple's strategy clear.

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[174] Justin Fox, *What Kind of Innovative Does Apple Have to Be?*, HARVARD BUSINESS REVIEW BLOG NETWORK (June 11, 2013), http://blogs.hbr.org/fox/2013/06/what-kind-of-innovative-does-apple-have-to-be.html. Consider, for example, the lack of widgets on Apple devices.
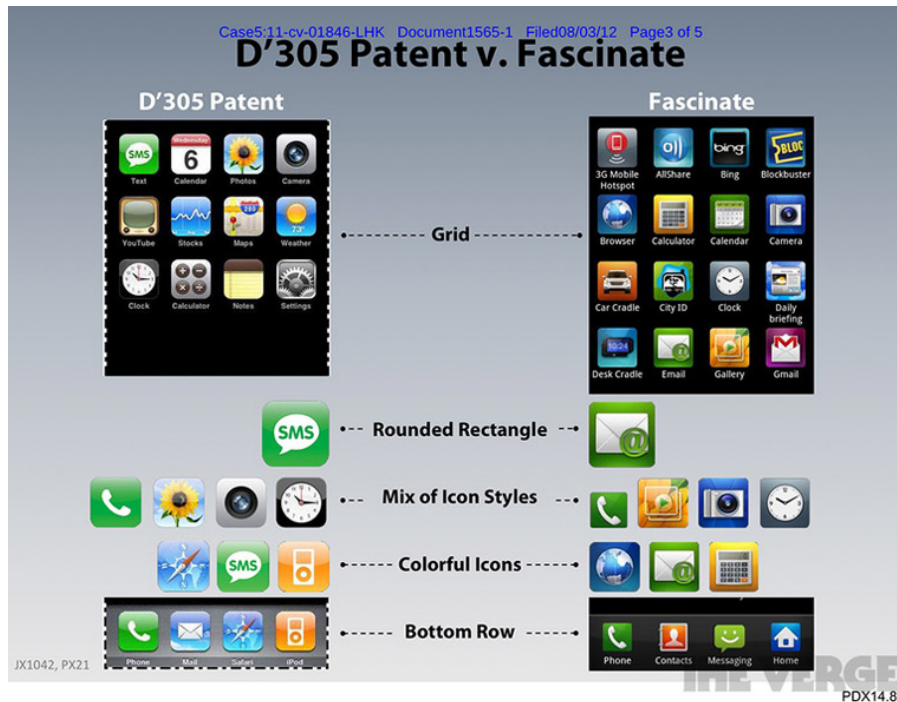
The strategy is plain. Samsung infringed because it used a) a grid, b) rounded rectangles, mixes of icon styles, colorful icons, and a bottom row with offsetting background. These are functions—ideas, ergonomics, operations. They are not the design themselves. To be sure, there is some similarity in the structure, sequence, and organization, but it is the structure and selection of *different* design elements.

In other words, the only way for Samsung could infringe is that the doctrine of equivalents applied so broadly that merely using the same ideas infringed. This seems to violate the maxim—in use today even as applied to design patents—of "that which would infringe if after, anticipates if before."[175] Given the rigidity with which the obviousness test is applied, as discussed above, it is unclear whether any court would say that Samsung's interface would render Apple's patent non-novel if it predated it;[176] Apple would surely claim that the functionality is similar, but the *actual design*

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[175] Int'l Seaway Trading Corp. v. Walgreens Corp., 589 F.3d 1233, 1239 (Fed. Cir. 2009) ("Moreover, it has been well established for over a century that the same test must be used for both infringement and anticipation."). *Compare* Id. at 1239 (finding that Crocs patent does not anticipate plaintiff's patent despite relatively small differences) *with* Crocs, Inc. v. Int'l Trade Comm'n, 598 F.3d 1294, 1304-05 (Fed. Cir. 2010) (finding infringement of Crocs patent despite relatively small differences from accused clogs). *See also* Du Mont & Janis, *Virtual Designs*, *supra* note 41, at *54 (discussing anticipation of computerized daisy by a daisy drawn on flowerpot because daisy on wallpaper, carpet, and shoes would infringe flowerpot patent).

[176] 35 U.S.C. § 102.

differs from the Samsung in important ways, such as all of the icons having different images. And if the Apple patent would be allowed even if Samsung's design were prior art, then Samsung should not be considered infringing.

But the court allowed the infringement verdict to stand. Here, application of the principles discussed here would have allowed the court to reach a different result. While Apple, and perhaps the conventional wisdom, believe that Android "copied" the iPhone patent, this was not slavish copying. The market substitution was not 1:1, and Android added value. Furthermore, the aspects that were copied were the functional aspects. As noted above, this implicates the customer need factor, and even the competitive need factor.

At the time that Samsung decided whether to implement Touch Wiz in the way it did, social welfare would have increased most by allowing this particular reuse. As a reminder, maximized wealth is societal wealth, not Apple's wealth. The world is better off with two smartphones competing for customers by introducing more and better features, especially if users can easily switch between the two of them as they so desire. As one example, Apple's unwillingness to implement a larger screen until 2012 despite tremendous popularity of larger Samsung screens implies that if Apple were the only product on the market, users would have missed out on product features that had nothing to do with the GUI design.

Current law may not (and in fact, did not) allow the wealth maximizing outcome. There are, for example, other ways to design a user interface for small mobile devices, such as Microsoft's Windows 8. Under current law, this implies that Apple's design cannot be functional because it was not dictated by function. However, alternative interfaces have not done nearly as well in the market.[177]

Another reason current law may not allow the wealth maximizing outcome is that courts are frenetic about whether and how to factor (the design patent term for filter) out functionality. The leading Federal Circuit decision, *Egyptian Goddess*,[178] ruled that the infringement analysis must consider the design as a whole, and not merely focus on the novel aspects.[179] But the case also noted that courts *could* instruct juries about

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[177] Alan Shimel, *Windows Phone U.S. Market Share Growth Outpaces Android*, NETWORK WORLD (Jun. 4, 2013) (despite growth, Windows 8 phones less than 6% of smartphone market), http://www.networkworld.com/community/blog/windows-phone-us-market-share-growth-outpaces-android. Apple would say that the reason is that its design is desired by more people, given that most of its business is going to either Apple or Android platforms that use a similar interface.

[178] Egyptian Goddess, Inc. v. Swisa, Inc., 543 F.3d 665 (Fed. Cir. 2008) (en banc).

[179] 543 F.3d at 672-73.

prior art and functional considerations.[180] However, the court left matters up to the discretion of the jury.[181]

This left later courts with little guidance. Some judges have factored out functionality, especially in bench trials.[182] Other judges have refused to do so. For example, in *Apple v. Samsung*, Judge Koh ruled that filtering might be permissive in some cases, but was not appropriate for a jury.[183]

In addition to the clear guidance in *Egyptian Goddess* and *Richardson* that filtering of functionality will be helpful to the *fact finder* (not just judge fact finders), as a matter of policy it seems odd that only in a bench trial can the proper analysis of functionality take place. Indeed, leaving filtering to the jury requires the appellate court to guess whether any filtering took place to determine whether there was substantial evidence of infringement. Worse, appellate courts *cannot guess*; they must *assume* that filtering took place, and *assume* that the jury properly compared *only* the ornamental features, even if the jury did not do so.

Thus, without such filtering, patentees can seek ever widening infringement claims based on reuse of the ideas and functions in the patent, rather than reuse of the actual design. The great irony of *Egyptian Goddess* is that it disapproves of written claim constructions layered on the drawings themselves; the court makes clear that the drawings should speak for themselves if they can.[184] This rule—when rigidly applied—leads to the very thing the case disapproves: infringement rulings based not on the drawings, but based on the ideas and functions in the drawings.

In contrast, the economic analysis implies that the law must explicitly allow filtering if social welfare is a goal. The court must be a gatekeeper

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[180] Egyptian Goddess 543 F.3d at 680 ("[A] trial court can usefully guide the finder of fact by addressing a number of other issues that bear on the scope of the claim. Those include . . . distinguishing between those features of the claimed design that are ornamental and those that are purely functional. . . Providing an appropriate measure of guidance to a jury without crossing the line and unduly invading the jury's fact-finding process is a task that trial courts are very much accustomed to . . . .")(citations omitted).

[181] Id.

[182] *See, e.g. Lee,* 838 F.2d at 1188 (affirming district court focus on specific design aspects but filtering out functional configuration of massager); Richardson v. Stanley Works, Inc., 597 F. 3d 1288, 1293-94 (Fed. Cir. 2010); OddzOn Prods., Inc. v. Just Toys, Inc., 122 F.3d 1396, 1405 (Fed.Cir.1997) (filtering later approved in *Egyptian Goddess* and in *Richardson*); Read Corp. v. Portec, Inc., 970 F.2d 816, 825 (Fed.Cir.1992).

[183] Order Granting in Part and Denying in Part Motion for Judgment as a Matter of Law, Apple, Inc. v. Samsung Elec. Co. Ltd., Case No. Case No.: 11-CV-01846-LHK, at pp. 3-4 (Document 2220, Jan. 29, 2013) ("Indeed, Egyptian Goddess warns of the risks of providing an element-by-element construction to a jury, as such instruction could divert the jury's attention from 'the design as a whole.').

[184] Egyptian Goddess, Inc. v. Swisa, Inc., 543 F.3d 665, 679 (Fed. Cir. 2008) (en banc).

that filters out functionality in the infringement calculus. Furthermore, it may have been error for the Federal Circuit to have left such instructions to the discretion of district court judges. Functional filtering is a matter of claim construction—determining what the patentee owns and what it does not.[185] As such, the construction should be performed by courts as a matter of law, pursuant to the Supreme Court's ruling in *Markman*.[186] As with obviousness, there should be no exceptionalism for design patent claim scope determinations.

Assuming that courts will perform filtering, *Lee v. Dayton-Hudson*[187] provides a clear, simple example. In that case, the design covered a particular design for a massager with a particular handle and rolling balls on the end.[188] The accused device comprised a differently shaped handle with differently shaped rolling balls on the end.[189] The Federal Circuit affirmed a finding of non-infringement, ruling that the designs themselves must match, not the ideas embodied by them: "While we agree [] that infringement can be found for designs that are not identical to the patented design, such designs must be equivalent in their ornamental, not functional, aspects."[190]

It should be noted, though, that filtering is not a panacea. Even if a court properly filters out functional elements, comparing the "entire" remaining ornamental design while ignoring functionality remains difficult to achieve in practice.[191] It may be even more difficult to achieve with graphical user interfaces, where form and function are intertwined.

Even so, the *Lee* case demonstrates that, as with copyright, courts have the ability—and some of the legal tools if they are willing to use them—to attempt to maximize social welfare. This is achievable right now, because

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[185] KeyStone Retaining Wall Sys., Inc. v. Westrock, Inc., 997 F.2d 1444, 1450 (Fed.Cir.1993) ("A design patent protects the non-functional aspects of an ornamental design as seen as a whole and as shown in the patent."); Amini Innovation Corp. v. Anthony Cal., Inc., 439 F.3d 1365, 1370 (Fed. Cir. 2006).

[186] Markman v. Westview Instruments, 517 U.S. 370, 390 (1996) (holding that court must construe patent claims.).

[187] 838 F.2d 1186.

[188] Id. at 1187.

[189] Id.

[190] Lee v. Dayton-Hudson Corp., 838 F.2d 1186, 1190 (Fed. Cir. 1988); Applied Arts Corp. v. Grand Rapids Metalcraft Corp., 67 F.3d 428, 430 (6th Cir.1933) ("To hold that general configuration made necessary by function must give to a patented design such breadth as to include everything of similar configuration, would be to subvert the purpose of the law, which is to promote the decorative arts. . . .").

[191] Amini Innovation Corp. v. Anthony Cal., Inc., 439 F.3d 1365, 1372 (Fed. Cir. 2006) ("The trial court is correct to factor out the functional aspects of various design elements, but that discounting of functional elements must not convert the overall infringement test to an element-by-element comparison. Thus, the trial court erred in its application of the "overall similarity" test on summary judgment.").

the Federal Circuit allowed it in *Egyptian Goddess* and the Supreme Court has arguably mandated it; district courts should take up the mantle.

CONCLUSION

Whether knowingly or not, courts have considered the importance of graphical user interface elements and done their best to reach outcomes that incentivize future innovation while maximizing current benefits. This means that software designers cannot own everything, even if they patent a design. It also means that we might be willing to live with slightly less incentive to create the first program, if it spurs improvement in the second program. To understand this point, one need only compare the most popular software packages today to the most popular packages doing the same thing 5, 10, or 20 years ago.

Copyright law has long understood this, and economic analysis explains how courts behaved in practice. Design patent law seems to have missed the memo, despite the fact that the tools are potentially available to achieve the same goal. None of the legal tools discussed in the article are newly created. Instead, the tools have been left to languish, perhaps because—until now— few design patents have been asserted to protect a large portion of an interface, rather than a single icon.

Given that tools are available, courts should use them and act as gatekeepers in design patent cases. Like in copyright, they need not affirmatively attempt to maximize—or even consider—social welfare. Instead, their instincts, coupled with the available doctrine, should suffice. If courts are allowed to aggressively consider functionality, and if they are encouraged to filter out functional elements during infringement, then they will likely gravitate, as they did in copyright cases, to beneficial outcomes.