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## ARTICLE

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### ABSTRACTION, FILTRATION, AND COMPARISON IN PATENT LAW

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*This essay explores how copyright's doctrine of abstraction, filtration, and comparison is being used in patent law, and how that use could be improved. This test, which finds its roots in the 1930's but wasn't fully developed until the 1990's, is one that defines scope for determining infringement. The copyrighted work is abstracted into parts, from ideas at the highest level to literal expression at the lowest. Then, unprotected elements are filtered out. Finally what remains of the original work is compared to the accused work to determine if the copying was illicit.*

*This sounds far removed from patent law, but there is a kinship, though perhaps one that is not so historic and a bit hidden. The essence of the test is determining protectable subject matter. These same needs permeate patent law as well. This essay explores how the test is implicitly used and should be explicitly used.*

*With design patents, the test might apply as it does in copyright, with functional elements being filtered out during infringement. Current precedent allows for this filtering, but not clearly or consistently. With utility patents, the abstraction, filtration, and comparison happen earlier, during the test for patentable subject matter. Here, the comparison is with what is conventional or well known. The essay concludes by discussing why the application is different for design and utility patents.*

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## INTRODUCTION

The notion of abstraction and filtration has been a core part of the copyright infringement inquiry at least since Judge Hand issued his opinion in *Nichols v. Universal Pictures*.<sup>1</sup> First, the plaintiff’s work is abstracted into its various components, from the most literal (say, the words of a novel) to the most abstract (the main idea of the novel). Then, those abstracted elements are put through a filter, whereby unprotected material is eliminated from consideration. The idea of a novel is not usually protectable, but the specific expression of the story would be. Only then are the remaining bits of copyright-protected expression compared with the allegedly infringing work.

Patent law lacks an obvious analogue. The “all elements rule” is straightforward: every element of the patentee’s claim is compared against the allegedly infringing product or method. If every element is met, there is infringement. If any element is missing, there is no infringement. We do not eliminate the unpatentable, nor do we compare only the point of novelty.<sup>2</sup> This particular “historic kinship”<sup>3</sup> between copyright and patent law seems to be estranged.

This essay seeks to heal the family rift in an unconventional way. It suggests that the courts are implicitly using abstraction, filtration, and comparison in both design patent and utility patent subject matter cases, and that they should do so more explicitly and carefully.

Patentable subject matter, whether design or utility, is a natural fit for abstraction, filtration, and comparison. In copyright, after all, the filtration step is intended to remove those elements that are not copyrightable. So too with patent law. For utility patents, courts are attempting to filter unprotectable abstract ideas and natural phenomena

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<sup>1</sup> *Nichols v. Universal Pictures Corp.*, 45 F.2d 119 (2d Cir. 1930).

<sup>2</sup> Mark A. Lemley, *Point of Novelty*, 105 NW. U. L. REV. 1253 (2011).

<sup>3</sup> *Sony Corp. of America v. Universal City Studios, Inc.*, 464 U.S. 417, 439 (1983) (“The closest analogy is provided by the patent law cases to which it is appropriate to refer because of the historic kinship between patent law and copyright law.”).

from protected inventions. For design patents, courts should filter functional elements from protected ornamental designs. The kinship of copyright and patent thus lends itself to similar filtration analysis.

This essay proceeds in three parts. Part I describes the history and application of abstraction, filtration and comparison in copyright. It turns out that this “historic” practice is not all that historic. Furthermore, the rule is not uniformly adopted (or adopted at all) in all the circuits, though academics have come to view it as essential to proper copyright infringement analysis.<sup>4</sup>

Part II examines utility patentable subject matter jurisprudence since *Mayo v. Prometheus*<sup>5</sup> set forth a new two-step test to determine eligibility. First requiring a determination if the claim is “directed”<sup>6</sup> to an abstract idea or natural phenomenon and then examining whether something unconventional was added to it.<sup>7</sup> This test is an exercise in abstraction and filtration. The first step necessarily requires selection of the level of abstraction to view the claim, from very general to very specific. The second step then filters out whatever the court deems is unprotectable and compares the remaining elements against some notion of conventionality.

Part III introduces design patent subject matter and the problem of functional designs. Where a design patent claim is both ornamental and functional, courts have had difficulty determining the proper scope of analysis for allegedly infringing devices that look similar only because they perform a similar function. This essay suggests that courts should more explicitly filter out functional elements before determining design patent infringement.

The essay concludes by briefly discussing how and why abstraction and filtration differs between design patents and utility patents. The reason has little to do with the rationale for the kinship and everything to do with administrability. Quite simply, given how patentable subject matter and infringement are tested in the different regimes, abstraction, filtration, and comparison can only work at one particular point in the process.

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<sup>4</sup> See generally, Mark A. Lemley, *Convergence in the Law of Software Copyright?*, 10 HIGH TECH. L.J. 1 (1995) (discussing the “filtration bandwagon” and widespread adoption of the test).

<sup>5</sup> *Mayo Collaborative v. Prometheus Labs.*, 566 U.S. 66 (2012).

<sup>6</sup> *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 134 S. Ct. 2347, 2355 (2014) (explaining the *Mayo* test and applying it to abstract ideas).

<sup>7</sup> *Id.* at 2357 (“At *Mayo* step two, we must examine the elements of the claim to determine whether it contains an ‘inventive concept’ sufficient to ‘transform’ the claimed abstract idea into a patent-eligible application.”).

## I. ABSTRACTION, FILTRATION, AND COMPARISON

When two copyrighted works share some similarities but many differences, how might infringement be determined? Assume for a moment that there is copying: that the accused saw the original work and intended to copy from it.<sup>8</sup> How similar is too similar? What if the similarities are non-literal – that is, they are in plot but not words or just a paraphrase?

Courts struggled with this question,<sup>9</sup> but eventually settled on a formulation devised by Judge Learned Hand in the *Nichols* case:

Upon any work, and especially upon a play, a great number of patterns of increasing generality will fit equally well, as more and more of the incident is left out. The last may perhaps be no more than the most general statement of what the play is about, and at times might consist only of its title; but there is a point in this series of abstractions where they are no longer protected, since otherwise the playwright could prevent the use of his “ideas,” to which, apart from their expression, his property is never extended.<sup>10</sup>

Of course, Judge Hand did not call it abstraction, filtration, and comparison, and as discussed below, it was not until the 1990s that this terminology took hold. Indeed, the test was known primarily as the *Nichols* abstractions test.<sup>11</sup> However, just a few years prior, the Second Circuit had introduced the notion of “dissection.” In *Dymow v. Bolton*, the court held that there could be no infringement where ordinary observation showed no similarity. *Dymow*’s use of dissection bears a strong resemblance to our modern understanding of filtration, finding that the only similarities between two plots in that case were

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<sup>8</sup> In copyright law, this is a requirement, though it is often skipped if there is no infringement under the abstraction filtration test. Skipping this requirement is convenient here, because patent law has no such copying requirement.

<sup>9</sup> *Nichols v. Universal Pictures Corp.*, 45 F.2d 119, 121 (2d Cir. 1930) (“[A]s soon as literal appropriation ceases to be the test, the whole matter is necessarily at large, so that... the decisions cannot help much in a new case.”).

<sup>10</sup> *Id.*

<sup>11</sup> See, e.g. *Computer Associates Int'l, Inc. v. Altai, Inc.*, 775 F. Supp. 544, 560 (S.D.N.Y. 1991) (“Professor Nimmer suggests that in lieu of the Whelan test of ‘structure, sequence, and organization’, a better approach to determining similarities in computer programs can be found in the ‘abstractions test’ first enunciated by Learned Hand . . .”). Indeed, Nimmer still calls this the abstractions test, and only briefly mentions filtration with respect to computer software. 4 Nimmer on Copyright § 13.03[A][1][a] (2018).

unprotectable ideas.<sup>12</sup> *Nichols* cites *Dymow*, but never mentions dissection while comparing elements of similarity between the works.

About fifteen years later, the Second Circuit expanded (and, frankly redefined) dissection in more music cases. The opinion in the first case, *Arnstein v. Broadcast Music*, required a dissection, specifically a technical analysis that involved breaking the work up into little pieces (rather than comparing the whole) to show that it was copied by the defendant.<sup>13</sup> Thus, the court kept the first part of *Dymow*'s formulation of dissection and ignored the second. In *Arnstein v. Porter*, the second and more famous opinion, the court made clear that dissection was only proper in the first stage of infringement analysis: determining whether there was copying in the first place.<sup>14</sup> Once copying has been established, the finder of fact then compares the whole work, with no dissection.<sup>15</sup>

*Arnstein v. Porter*'s notion of dissection is at odds with the *Nichols* view of abstraction. Judge Hand assumed copying in *Nichols*.<sup>16</sup> Under *Porter*, then, there should have been no dissection. This means that *Nichols* was either a) applying the *Dymow* version of dissection, or b) applying some test other than dissection. One might think that *Arnstein v. Porter* would have disavowed the *Nichols* approach, but instead *Nichols* was cited approvingly.

This left the legacy of *Nichols* in a state of flux. While it was followed, it was not universally loved. Judge Easterbrook noted: "Sometimes called the 'abstractions test', Hand's insight is not a 'test' at all. It is a clever way to pose the difficulties that require courts to avoid either extreme of the continuum of generality. It does little to help resolve a given case...."<sup>17</sup> Of course, Hand was not blind to this difficulty; after laying out his test, he noted: "Nobody has ever been able to fix that boundary, and nobody ever can."<sup>18</sup>

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<sup>12</sup> *Dymow v. Bolton*, 11 F.2d 690, 692 (2d Cir. 1926) ("It requires dissection rather than observation to discern any resemblance here. If there was copying [which we do not believe], it was permissible, because this mere subsection of a plot was not susceptible of copyright.")

<sup>13</sup> *Arnstein v. Broadcast Music Inc.*, 137 F.2d 410, 412 (2d Cir. 1943) ("When we are confronted with the fact that similarities between these songs cannot be readily detected by the lay ear, nor by the effect of the composition as a whole, but can only be discovered by what Judge Hough aptly called 'dissection,' we can find no infringement."), citing *Dymow*.

<sup>14</sup> *Arnstein v. Porter*, 154 F.2d 464, 468 (2d Cir. 1946).

<sup>15</sup> *Id.*

<sup>16</sup> *Nichols v. Universal Pictures Corp.*, 45 F.2d 119, 120 (2d Cir. 1930) ("[W]e may assume, arguendo, that in some details the defendant used the plaintiff's play . . .").

<sup>17</sup> *Nash v. CBS, Inc.*, 899 F.2d 1537, 1540 (7th Cir. 1990).

<sup>18</sup> *Nichols*, 45 F.2d at 121. Whenever I teach *Nichols*, I show this quote and say to my students, "So good luck with that."

The Ninth Circuit made its own attempt to clean up the doctrine. It first introduced the term analytic dissection in the landmark case *Sid & Marty Krofft Television Prods., Inc. v. McDonald's Corp.*<sup>19</sup> As discussed above, dissection had long been used in copyright, but it is unclear from where the Ninth Circuit developed the term “analytic dissection.” This was the first reported case to use the term, but the court announces that analytic dissection is proper under its new rule with no citation, explanation, or other background, as if anyone reading will understand what that term means.

More importantly, the 1977 opinion uses analytic dissection not as a threshold test, like *Porter*, but in a two-part, concurrent analysis similar to *Dymow*. So-called “extrinsic” similarity is an objective comparison of the copyrighted and accused works that allows for “analytic dissection” by experts to determine which elements were not protectable.<sup>20</sup> “Intrinsic” similarity is a subjective test by the finder of fact, similar to *Arnstein v. Porter*’s second step.<sup>21</sup> The *Krofft* court cites the *Porter* case, and essentially follows it, finding that the defendants may not avoid infringement by extracting out ideas and other unprotected aspects before comparison.

But this was not the end. Other circuits found *Krofft* and *Porter* too restrictive. In 1982, *Atari, Inc. v. North American Philips Consumer Electronics, Corp.*, the Seventh Circuit found that filtration-style analytic dissection was proper to ensure that only protected expression was being compared.<sup>22</sup> *Krofft* was eventually modified in 1987, so that similarities could be dissected in the intrinsic test, so that only protected expression was compared.<sup>23</sup> This was reinforced in 1988, where the court applied analytic dissection of similarities to exclude unprotected elements.<sup>24</sup> And in 1990, the Ninth Circuit again allowed analytic dissection, but reverted to making it part of the extrinsic test.<sup>25</sup> This is

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<sup>19</sup> 562 F.2d 1157 (9th Cir. 1977).

<sup>20</sup> *Shaw v. Lindheim*, 919 F.2d 1353, 1359 (9th Cir. 1990); *Sid & Marty Krofft Television v. McDonald's Corp.*, 562 F.2d at 1164.

<sup>21</sup> *Sid & Marty Krofft Television v. McDonald's Corp.*, 562 F.2d at 1164.

<sup>22</sup> *Atari, Inc. v. N. Am. Philips Consumer Elecs., Corp.*, 672 F.2d 607, 614-15 (7th Cir. 1982).

<sup>23</sup> *Aliotti v. R. Dakin & Co.*, 831 F.2d 898, 901 (9th Cir. 1987) (“[N]o substantial similarity may be found under the intrinsic test where analytic dissection demonstrates that all similarities in expression arise from the use of common ideas.”).

<sup>24</sup> *Data East USA, Inc. v. Epyx, Inc.*, 862 F.2d 204, 208-9 (9th Cir. 1988).

<sup>25</sup> *Brown Bag Software v. Symantec Corp.*, 960 F.2d 1465, 1475-76 (9th Cir. 1992) (“Brown Bag’s argument ignores the evolution of the ‘extrinsic’ component of the *Krofft* analysis. Properly understood, the district court’s analysis was not a misapplication of the ‘intrinsic test,’ but a proper application of the revised ‘extrinsic test.’ Under the reformulated extrinsic test, we

more similar to filtration, but it is different from *Porter* and a complete reimagination of *Krofft*.

Thus, it took some sixty years for the courts to explicitly note that some form of abstraction, filtration, and comparison should take place when comparing works.<sup>26</sup> It is unclear how the *Computer Associates* Court was swayed to adopt the term “filtration” for the second step. It did not appear in any of the briefing. The court appears to have been persuaded by David Nimmer, who had suggested using a “successive filtering” in his treatise and earlier in a law review article.<sup>27</sup> In any event, *Computer Associates v. Altai* still governs how we apply the abstraction-filtration-comparison test today.

Despite analytical dissection’s tortured past in other circuits, the notion of filtration was new in the Second Circuit. Given that *Porter* was the law of the circuit, it is not surprising that *Computer Associates* instead cited to Ninth Circuit case law<sup>28</sup> to justify that “analytic dissection” was proper during the comparison stage. In doing so, it ruled that computer programs are outside the normal rules of *Arnstein v. Porter*.<sup>29</sup> As a result, the rule has been explicitly applied primarily to computer programs, though there are some exceptions.<sup>30</sup> Nonetheless, *Nichols* remains good law and continues to be cited, so it is unclear whether, in complex non-software works, a separate test will always apply to other types of expressive works.

Though there are slight differences across circuits, the basic abstraction, filtration, and comparison procedure is the same. First, the elements of the work (the court focused on computer software but noted that it could apply to other works) should be parsed into their various levels of abstraction, from the highest level (the idea) to the lowest (the specific expression). Second, those elements are put through the sieve of copyrightability. Anything unprotected is removed. In software, the court notes that this may include elements dictated by efficiency or external factors, but more generally ideas, scenes à faire, and pure fact

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mean to perpetuate ‘analytic dissection’ as a tool for comparing not only ideas but also expression.”).

<sup>26</sup> *Computer Assocs. Int’l, Inc. v. Altai, Inc.*, No. 762, 1992 WL 139364, at \*12 (2d Cir. June 22, 1992), opinion withdrawn and superseded on reh’g, 982 F.2d 693 (2d Cir. 1992).

<sup>27</sup> 4 Nimmer on Copyright § 13.03[F] (2018); David Nimmer et al., *A Structured Approach to Analyzing the Substantial Similarity of Computer Software in Copyright Infringement Cases*, 20 ARIZ. ST. L.J. 625 (1988).

<sup>28</sup> *Computer Assocs. Int’l, Inc. v. Altai, Inc.*, 982 F.2d 693, 707 (2d Cir. 1992), citing *Brown Bag Software v. Symantec Corp.*, 960 F.2d 1465, 1475 (9th Cir. 1990).

<sup>29</sup> *Id.* at 713.

<sup>30</sup> *King Zak Indus., Inc. v. Toys 4 U USA Corp.*, No. 16-CV-9676 (CS), 2017 WL 6210856, at \*5 (S.D.N.Y. Dec. 8, 2017) (discussing application of test).

might be filtered. The filtration process leaves behind the “golden nuggets”<sup>31</sup> of copyrightable expression. The finder of fact then compares the remaining expression to the accused work to determine infringement.

When applied this way, the test solved some of Easterbrook’s concerns in *Nash*. Abstraction alone is no test, but the decomposition of the work allows the uncopyrightable items to be poked out before two works are compared. To be sure, this does not make the comparison step any easier; it is still difficult to determine how much copying is too much. But using the abstraction-filtration method, at least the finder of fact is comparing copying of protected expression rather than unprotected ideas.

It did not take long for the new test to take hold. A district court in Colorado cited (and disregarded as a minority view) the initial, withdrawn opinion in *Computer Associates* a mere two days after it issued.<sup>32</sup> The Tenth Circuit reversed and followed *Computer Associates*.<sup>33</sup> Other circuits, though not all, followed suit.<sup>34</sup>

Recounting the muddled history of abstraction, filtration, and comparison is important for several reasons. First, the historic kinship of copyright and patent law described in *Sony* may not be terribly historic.<sup>35</sup> Abstraction and filtration is, at most, less than one hundred years old. Second, what kinship there is may be unclear in part because there is no clear body of law that ties the two together beyond the Constitution. Copyright courts and scholars cannot agree about when or how to apply abstraction, filtration, and comparison, so garnering agreement in patent law may be difficult.

All is not lost, however. The rise of abstraction and filtration came with the growth of expressive works imbued with functional, unprotectible aspects: computer software. Whether that development started in 1930 or in 1990, the result is the same: courts have special concerns about combined subject matter. And, as further explored below, these issues also permeate patent law. While there have always been business methods patents,<sup>36</sup> for example, there is no denying the

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<sup>31</sup> *Computer Associates Int’l, Inc. v. Altai, Inc.*, 982 F. 2d 693, 710 (2d Cir. 1992).

<sup>32</sup> *Gates Rubber Co. v. Bando American, Inc.*, 798 F. Supp. 1499, 1524 (D. Colo. 1992).

<sup>33</sup> *Gates Rubber Co. v. Bando Chemical Indus., Ltd.*, 9 F.3d 823, 834 (10th Cir. 1993).

<sup>34</sup> *Bateman v. Mnemonics, Inc.*, 79 F.3d 1532 (11th Cir. 1996); *Engineering Dynamics, Inc. v. Structural Software, Inc.*, 26 F.3d 1335 (5th Cir. 1994).

<sup>35</sup> See also, Peter Menell, *The Use and Misuse of Intellectual Property Kinship* at the J.L. & INNOVATION Symposium at the University of Pennsylvania (April 19, 2018).

<sup>36</sup> Michael Risch, *America’s First Patents*, 64 FLA. L. REV. 1279 (2012).



growth of software patents in the last thirty years,<sup>37</sup> and these patents are more likely to be abstract. Based on these parallels, the “historic” kinship between copyright and patent has something to offer. It is with this background that we explore the patent law.

## II. UTILITY PATENT SUBJECT MATTER

Unlike design patents, utility patents protect useful inventions.<sup>38</sup> But they do not protect all inventions. Products of nature, natural phenomena, and abstract ideas may not be protected.<sup>39</sup> When the Court announced these limitations, there were no cases that directly tackled these subject matters. Instead, patentable subject matter was a series of cases that rejected patent claims using different language and focusing on other problems of patentability.<sup>40</sup> It was not until 2012, in *Mayo v. Prometheus*, that the Court settled on some sort of regularized test of patentable subject matter with respect to natural phenomena.<sup>41</sup> Two years later, the Court stated the test more succinctly while applying it to abstract ideas:<sup>42</sup>

First, we determine whether the claims at issue are directed to one of those patent-ineligible concepts. If so, we then ask, what else is there in the claims before us? To answer that question, we consider the elements of each claim both individually and as an ordered combination to determine whether the additional elements transform the nature of the claim into a patent-eligible application. We have described step two of this analysis as a search for an inventive concept — *i.e.*, an element or combination of elements that is sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the ineligible concept itself.<sup>43</sup>

This test was not entirely new, despite the mish-mosh of cases to come before. Instead, the notion of “inventive concept” had been

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<sup>37</sup> James Bessen, *A Generation of Software Patents*, 18 B.U. J. SCI. & TECH. L. 241 (2012).

<sup>38</sup> 35 U.S.C. §101.

<sup>39</sup> *Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980).

<sup>40</sup> *See generally*, Michael Risch, *Everything is Patentable*, 75 TENN. L. REV. 591 (2008).

<sup>41</sup> *Mayo Collaborative v. Prometheus Labs.*, 566 U.S. 66 (2012).

<sup>42</sup> *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 134 S. Ct. 2347 (2014). The test does not seem to apply to products of nature, and this essay does not address them. *Ass'n for Molecular Pathology v. Myriad Genetics, Inc.*, 133 S. Ct. 2107 (2013) (not citing *Prometheus* in determining eligibility); Dan Burk, *The Curious Incident of the Supreme Court in Myriad Genetics*, 90 NOTRE DAME L. REV. 505, 541 (2014).

<sup>43</sup> *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 134 S. Ct. at 2355.

introduced in a 1948 case<sup>44</sup> and then renamed “post-solution activity” in a later case.<sup>45</sup> But it was an attempt to solve a longstanding problem in patentable subject matter jurisprudence.

That problem is simple to identify, but extremely difficult to solve: every invention, at bottom, is in some sense a natural phenomenon or abstract idea, and so separating unpatentable ideas and phenomena from patentable ones requires judgment calls. The two-step test attempts to solve this problem by identifying whether the elements claimed in addition to the unpatentable subject matter are enough to warrant eligibility for protection.

Regardless of the level of abstraction chosen, courts are necessarily performing filtration and comparison as they go about applying the second *Prometheus-Alice* step.<sup>46</sup> Once the essence of the claim has been determined via abstraction, it is essentially filtered out, no longer to be considered part of the patentable subject matter. The reasons for this filtering are not so clear cut as in copyright. Some cases call it preemption.<sup>47</sup> Some assume that natural phenomena or abstract ideas are part of the prior art.<sup>48</sup> Others just say such material is unpatentable as a matter of history.<sup>49</sup> Regardless, the parallels with copyright are straightforward: that which is unpatentable should be excluded.

The comparison step is not so straightforward, though it is parallel. Once the unpatentable has been filtered, the remaining claim elements are compared with “conventional” solutions. If the elements are new and different from the conventional, then the subject matter is eligible. If, however, little remains but the conventional, then the subject matter is not patent eligible.

Breaking the *Prometheus-Alice* test into its copyright-like parts illustrates the difficulties associated with the method. Beginning with the level of abstraction, as noted above, the choice can have an outsized effect on what is filtered. As a first matter, it is unclear why there must be a single level of abstraction. The genius of the copyright test is that multiple levels of abstraction are separated, and uncopyrightable

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<sup>44</sup> Funk Bros. Seed Co. v. Kalo Co., 333 U.S. 127 (1948).

<sup>45</sup> Parker v. Flook, 437 U.S. 584 (1978). See Jeffrey A. Lefstin, *Inventive Application: A History*, 67 FLA. L. REV. 565 (2015) for a thorough historical treatment of this test.

<sup>46</sup> *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1335 (Fed. Cir. 2016) (“Rather, the ‘directed to’ inquiry applies a stage-one filter to claims, considered in light of the specification, based on whether ‘their character as a whole is directed to excluded subject matter.’”); *Ultramercial, Inc. v. Hulu, LLC*, 772 F.3d 709, 720 (Fed. Cir. 2014) (discussing “coarse filter” approach to patentable subject matter).

<sup>47</sup> *Gottschalk v. Benson*, 409 U.S. 63, 72 (1972).

<sup>48</sup> *Parker v. Flook*, 437 U.S. at 591.

<sup>49</sup> *Bilski v. Kappos*, 561 U.S. 593, 625 (2010).

elements are filtered at each level so that the remaining pieces — from abstract to literal — can be compared and analyzed. By forcing patents into a single level of abstraction, the error rate is much higher, because valuable information about the patent claim is removed at the abstraction stage rather than the filtration stage.

Thus, if the level of abstraction is set too broadly, then too much of the invention is filtered out. Consider, for example, Davenport’s electric motor: “Applying magnetic and electro-magnetic power as a moving principle for machinery in the manner above described, or in any other substantially the same in principle.”<sup>50</sup> At the lowest level of abstraction it is a motor, which is decidedly not abstract. Little is filtered, and the motor is a big inventive leap from the conventional. At the highest level of abstraction, it is the natural phenomenon that electricity running through a coil wrapped around a magnet will cause the magnet to spin. Once this is filtered out, little remains but actually running current through a wire, which was conventional, even in 1837.<sup>51</sup>

In this sense, the level of abstraction is orthogonal to that of copyright. In copyright, abstraction at a high level leaves more to be compared, but that comparison is specific expression. With patents, abstraction at a high level leaves less to be compared, because the idea often subsumes the specific elements of the patent claim. In the electric motor, for example, abstracting to the level of wire coiled around a magnet eliminates the specifics: wire and a magnet. To the extent that the wire and magnet were new, non-obvious, unconventional, difficult to implement, or otherwise inventive, they are lost in the abstraction of the general idea.

The difficulties of abstraction in this framework have been well studied even before *Prometheus*,<sup>52</sup> and solutions to it have been proposed.<sup>53</sup> Under the current two-step test, selection of the proper level of abstraction can mean the difference between eligibility or not.

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<sup>50</sup> U.S. Patent No. 132 (issued Feb. 25, 1837).

<sup>51</sup> RICHARD PHILLIPS, A MILLION OF FACTS, AND CORRECT DATA, IN THE ENTIRE CIRCLE OF THE SCIENCES, AND ON ALL SUBJECTS OF SPECULATION AND PRACTICE: ADAPTED TO THE CLOSET AND THE ACTIVE WORLD 432–34 (1833) (describing Faraday’s and others’ experiments with electricity and magnetism), available at [https://books.google.com/books?id=524y\\_35YY1gC](https://books.google.com/books?id=524y_35YY1gC).

<sup>52</sup> Tun-Jen Chiang, *The Levels of Abstraction Problem in Patent Law*, 105 NW. U. L. REV. 1097 (2011); Mark R. Carter, *Copyright’s Hand Abstractions Test for Patent’s Section 101 Subject-Matter Eligibility*, 30 SANTA CLARA HIGH TECH. L. J. 469 (2014); Michael Risch, *Nothing is Patentable*, 67 FL. L. REV. FORUM 45 (2015).

<sup>53</sup> Risch, *supra* note 40; Mark A. Lemley, Michael Risch, Ted Sichelman & R. Polk Wagner, *Life After Bilski*, 63 STAN. L. REV. 1315 (2011).

Depending on any given court's selected level, some of our most famous inventions might suddenly become abstract ideas.<sup>54</sup>

Even if the difficulties of abstraction are solved, filtration also presents challenges. Filtration asks the court to consider patent claims at the point of novelty, rather than consider them as a whole. From the time since *Diamond v. Diehr*,<sup>55</sup> courts have been instructed to consider patent claims as a whole. Even the Court in *Alice* repeats the mantra that the entire claim should be considered.<sup>56</sup> Indeed the Court then went on to characterize a very particular process for handling escrow as the abstract idea of “intermediated settlement.”<sup>57</sup> From there, the Court ruled that all that remained after filtering would “merely require generic computer implementation.”<sup>58</sup> In other words, though the Court gave lip service to considering the whole claim, it did so by finding the gist of the patent.<sup>59</sup>

The practical result is that courts engage in little filtering. They typically determine the gist of the claim, which is dispositive. Cases are won and lost in the high stakes abstraction phase, as cases that find the claim to be abstract/natural and *then* add something unconventional are exceedingly rare.

If *Prometheus-Alice* two-step test is to continue, courts should better calibrate their abstraction and filtration steps by abandoning the fiction that they are examining claims as a whole. Rather than simply identifying the gist of the claim, during step one the court should instead focus on the ideas or phenomena at play. This would be true in any claim. But that abstraction, once filtered, would leave much more remaining for comparison.

Judges, lawyers, and commentators might protest that courts are already undertaking this fine-grained analysis, but they are not. Courts are caught in the cycle of trying to identify what whole claims mean when those claims clearly have specific elements. Even the recent case

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<sup>54</sup> Risch, *supra* note 52, at 53.

<sup>55</sup> 450 U.S. 175 (1981).

<sup>56</sup> *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 134 S. Ct. 2347, 2355 (2014) (“To answer that question, we consider the elements of each claim both individually and ‘as an ordered combination’ to determine whether the additional elements ‘transform the nature of the claim’ into a patent-eligible application.”).

<sup>57</sup> *Id.* at 2356.

<sup>58</sup> *Id.* at 2357.

<sup>59</sup> *SRI Int'l v. Matsushita Elec. Corp. of Am.*, 775 F.2d 1107, 1124 (Fed. Cir. 1985) (disapproving of the use of “gist” of the patent for determining factual questions); see also, Lemley, *supra* note 2, at 1279 (discussing difficulties associated with point of novelty analysis in patentable subject matter).

*Berkheimer v. HP*<sup>60</sup> — in which the Federal Circuit recognized that courts should do a better job analyzing step two — simplified a patent claim to a very broad and general idea rather than considering each specific element’s abstractness.<sup>61</sup>

The comparison stage is also troublesome. A primary problem, of course, is merely an extension of filtration. When the right level of abstraction is selected, comparison is often rendered moot. Secondary, though, is the difficulty in determining what constitutes a sufficient inventive step, including what is routine, well-known, or conventional. The Federal Circuit recently recognized this problem, ruling that — at least in some cases — this determination is a question of fact, and that mere presence in the prior art is insufficient.<sup>62</sup>

A more deliberate comparison step should define the threshold necessary to determine what is a sufficient inventive step. But that comparison should also operate differently than an anticipation or obviousness analysis. Instead, the goal of the comparison should be to determine whether the non-abstract (or non-natural) elements constitute an application of the natural principle.<sup>63</sup> Such a comparison would take a detailed look at those elements of the claim that were not filtered out, something that rarely happens now. It would consider whether those elements are, in the words of *Mayo*, “more than simply [] the law of nature while adding the words ‘apply it.’”<sup>64</sup> While the Court called this an inventive step, the heart of the analysis was to determine whether the claims did something “more” than the unpatentable.<sup>65</sup> Abstraction, filtration, and comparison is well suited for this, though courts are not actually performing this comparison.

Thus, courts are implicitly performing abstraction, filtration, and comparison in utility patent subject matter. But they aren’t doing so deliberately or optimally. If courts are to continue with their current subject matter jurisprudence,<sup>66</sup> then they should more deliberately learn

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<sup>60</sup> 881 F.3d 1360 (Fed. Cir. 2018).

<sup>61</sup> *Id.* at 1368 (holding that a claim including parsing, comparing, and presenting differences for reconciliation to be “directed to the abstract idea of parsing and comparing data”).

<sup>62</sup> *Id.* at 1369 (“Whether something is well-understood, routine, and conventional to a skilled artisan at the time of the patent is a factual determination. Whether a particular technology is well-understood, routine, and conventional goes beyond what was simply known in the prior art. The mere fact that something is disclosed in a piece of prior art, for example, does not mean it was well-understood, routine, and conventional.”).

<sup>63</sup> *Mayo Collaborative v. Prometheus Labs.*, 566 U.S. 66 (2012); Lemley, *supra* note 2; Lemley et al., *supra* note 53.

<sup>64</sup> *Mayo Collaborative*, 566 U.S. at 72.

<sup>65</sup> *Id.* at 72-73.

<sup>66</sup> This is a contested point. Risch, *supra* note 40.

from the lessons of copyright to filter out only those specific elements that are unpatentable, and then compare what remains with common or conventional elements to ensure that what remains is an application of the unpatentable, rather than simply a repetition of it.

### III. DESIGN PATENT SUBJECT MATTER

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 therefore . . .”<sup>67</sup> An “article of manufacture” can include an entire product for sale, or just a portion of it.<sup>68</sup> As a result, an infringing device could look nothing like the original, so long as the (potentially very small) portion — for example, the shank of a drill bit — that happens to be patented is infringed.

Design patents afford their owners much stronger protection than copyrights,<sup>69</sup> not the least of which is that one can infringe without ever copying, let alone seeing, the original.<sup>70</sup> Any use of the design brings liability, and there is no independent development defense. Any infringement brings liability, without regard to any fair or other equitable use defense.<sup>71</sup>

This stronger protection is coupled with two offsetting rules designed to mitigate unfair application of design patents on unsuspecting defendants. First, because the protection is stronger, the duration is much shorter. Protection lasts for fourteen years from the date the patent is granted.<sup>72</sup> Second, design patents are still patents. They must survive the rigors of patent examination. Only those designs that are novel and nonobvious may be granted. These rigors tend to be more illusory than protective, however. One study found that the PTO grants 90% of design patent applications,<sup>73</sup> with an average pendency of merely 15 months.<sup>74</sup>

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<sup>67</sup> 35 U.S.C. § 171 (2011).

<sup>68</sup> *Samsung Elecs. Co., Ltd. v. Apple Inc.*, 137 S. Ct. 429, 436 (2016) (“[T]he term ‘article of manufacture’ is broad enough to embrace both a product sold to a consumer and a component of that product, whether sold separately or not.”).

<sup>69</sup> *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).

<sup>70</sup> Compare 17 U.S.C. § 501 (2011) (defining copyright infringement as violation of a right, for example, to make copies), with 35 U.S.C. § 271(a) (2011) (outlawing the making, using, or selling of an infringing product).

<sup>71</sup> 35 U.S.C. § 271(a) (2011).

<sup>72</sup> 35 U.S.C. § 173 (2011).

<sup>73</sup> Dennis D. Crouch, *A Trademark Justification for Design Patent Rights*, RESEARCH PAPER NO. 2010-17 \*18 (Missouri Law Legal Studies Research Paper Series, 2010).

<sup>74</sup> *Id.* at \*20.

Forty-five percent of design patent applications had a pendency less than one year.<sup>75</sup> In contrast, the average pendency of utility patents during the same time period was more than four years for the most common filing type.<sup>76</sup>

Some of the reduced pendency may be due to a better application-to-examiner ratio for design patents. But even with this worker advantage, the examination process should be adding work. Design patents tend to cite a lot of prior art,<sup>77</sup> and examiners added more than half of that prior art from their own searches.<sup>78</sup>

Despite finding so much prior art,<sup>79</sup> examiners almost never reject based on prior art. First, design patents, including GUI patents that are examined slightly more closely, rarely face a rejection during prosecution. A study of design patent examination found that only 13% of design patent applications received *any* rejection at all, with a slightly higher percentage of 19% for graphical user interface patents.<sup>80</sup> The other 80+% issue with no rejection whatsoever. Non-GUI design patents are virtually never rejected; in a sample from 1996 until the 2011, only 3.37% of all rejections were for novelty or obviousness, and of those, no final rejection in the sample group cited novelty or obviousness.<sup>81</sup> For graphical user interface patents, fewer than 15% of all rejections were based on non-novelty or obviousness.<sup>82</sup>

With respect to subject matter, the study found that, in its sample, there were almost no rejections for functionality in a 15-year sample, including in graphical user interface and animated design patents.<sup>83</sup> This is unsurprising given the history and current interpretation of the statute.

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<sup>75</sup> *Id.*

<sup>76</sup> Dennis Crouch, *Update on Patent Pendency*, PATENTLY-O (Apr. 30, 2010, 6:43 AM), <http://www.patentlyo.com/patent/2010/04/average-pendency-of-utility-patents-issued-april-27-2010claim-priority-to-foreign-applicationyesnoclaim-priority-to-us-no.html>.

<sup>77</sup> 20.6 mean references, 13 median.

<sup>78</sup> 11 mean references, 9 median. These counts reflect all issued patents between 2005 and 2012. Data on file with author. The number of references cited has increased with time. Jason J. Du Mont & Mark D. Janis, *Virtual Designs*, 17 STAN. TECH. L. REV. 107, 144 (2013).

<sup>79</sup> Examiners add only 34% of the references for utility patents. *Id.* at 148 n. 181 (citing Christopher A. Cotropia, Mark Lemley & Bhaven Sampat, *Do Applicant Citations Matter?*, 42 RES. POL'Y 844, 846 (2013)). Even so, utility patents are rejected for novelty and obviousness much more frequently. *Id.* at 153 (noting study showing 86% of utility patents receive at least one novelty or obviousness rejection).

<sup>80</sup> Du Mont & Janis, *supra* note 78, at 153.

<sup>81</sup> *Id.* at 155.

<sup>82</sup> *Id.*

<sup>83</sup> *Id.* at 155–56.

The first design patent statute, enacted in 1842, envisioned protection for novel drawings and images incorporated into articles of manufacture.<sup>84</sup> 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.<sup>85</sup>

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. In *Ex parte Crane*,<sup>86</sup> the first decision to interpret this part of the statute, the Commissioner of Patents stated:

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.

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 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.<sup>87</sup>

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<sup>84</sup> Patent Act of Aug. 29, 1842, § 3, 5 Stat. 543 (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 . . .”).

<sup>85</sup> Act of July 8, 1870, ch. 230, § 85-111, 16 Stat. 198, 212-16; Donald M. Millinger, *Copyright and the Fine Artist*, 48 GEO. WASH. L. REV. 354, 356 (1980); cf. *Copyright*, 3 AM. L. REV. 453, 454-55 (1869) (“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.”).

<sup>86</sup> *Ex parte Crane*, 1869 Dec. Comm’r Pat 7 (patent granted on new arrangement of product that had already been denied a utility patent as non-novel).

<sup>87</sup> *Id.* at 7-9; see also *Ex parte Bartholemew*, 1869 Dec. Comm’r Pat. 103, 103 (“In thus denying that a new ‘shape or configuration’ of an article, whereby utility or convenience is



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.<sup>88</sup>

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.<sup>89</sup> 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.<sup>90</sup> 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.<sup>91</sup> The number of cases invalidating patents is far outweighed by the number of cases allowing them.

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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.”)

<sup>88</sup> Gerard N. Magliocca, *Blackberries and Barnyards: Patent Trolls and the Perils of Innovation*, 82 NOTRE DAME L. REV. 1809, 1820-21 (2007); see also USPTO, ANNUAL REPORT OF THE COMMISSIONER OF PATENTS FOR THE YEAR 1871, at 17 (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.”).

<sup>89</sup> S. REP. NO. 57-1139, at 2-3 (1902).

<sup>90</sup> *Mygatt v. Zalinski*, 138 F. 88, 89 (C.C.S.D.N.Y. 1905) (“That it is useful as well as ornamental does not affect its patentability as a design patent.”); see also *Ethicon Endo-Surgery, Inc. v. Covidien, Inc.*, 796 F.3d 1312, 1333 (Fed. Cir. 2015) (“[T]he design claim is not invalid, even if certain elements have functional purposes.”). 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.”).

<sup>91</sup> *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);

Thus, Federal Circuit precedent allows design patents that incorporate functional elements, unless the design embodies the function or unless the function is essential to the use of the product.<sup>92</sup> But design patents do not require a use, making the test difficult. Designs that might be functional in one context, say a key blade designed to fit a type of lock,<sup>93</sup> become completely ornamental when hung as a necklace pendant or used as a (dangerous) toy.<sup>94</sup> Determinations of functionality in a market must depend, at least in part, on how the product will be used.<sup>95</sup> Patentees can almost always point to some ornamental aspect that is unrelated to a particular use.

Thus, the current subject matter rule functionality rule tilts toward patentability. The defendant must prove functionality by clear and convincing evidence,<sup>96</sup> and if design alternatives exist, courts will not find functionality,<sup>97</sup> presumably even if all the alternatives are patented. This is a distinct departure from copyright, where few design alternatives will bar protection under the merger doctrine. As a result, a combination of elements, each of which might serve some utilitarian purpose, can be

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L.A. Gear, Inc. v. Thom McAn Shoe Co., 988 F.2d 1117, 1123 (Fed. Cir. 1993); *In re Carletti*, 328 F.2d 1020, 1022 (C.C.P.A. 1964); *Robert W. Brown & Co., Inc. v. De Bell*, 243 F.2d 200, 202-03 (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 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).

<sup>92</sup> *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 Grp. Int’l, Inc. v. L.A. Gear Cal., Inc.*, 853 F.2d 1557, 1563 (Fed. Cir. 1988); *Thom McAn*, 988 F.2d at 1123 (“If the particular design is essential to the use of the article, it can not be the subject of a design patent.”).

<sup>93</sup> *Best Lock*, 94 F.3d at 1566.

<sup>94</sup> *See, e.g., Du Mont & Janis*, *supra* note 78, at 165 (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 Teddy Chainsaw Bear, both of which have dual function/playtime uses. *See Saturday Night Live: Consumer Probe* (NBC television broadcast Dec. 11, 1976), available at <https://www.nbc.com/saturday-night-live/video/irwin-mainway/n8641>, transcript available at SATURDAY NIGHT LIVE TRANSCRIPTS, <https://web.archive.org/web/20180121035746/http://snltranscripts.jt.org/76/76jconsumerprobe.phtml> (last visited July 28, 2018).

<sup>95</sup> 37 CFR § 1.153 (2012) 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 § 1503.01 ¶ 15.05 (8th ed. Rev. 9, Aug. 2012) (“An acceptable title would be ‘door for cabinets, houses, or the like,’ while the title ‘door or the like’ would be unacceptable . . .”). Thus, “Key Design for locks, necklaces, or toys” would be acceptable.

<sup>96</sup> *Thom McAn*, 988 F.2d at 1123. Presumably, the examiner could reject functional designs using a lower evidentiary standard, but this virtually never happens.

<sup>97</sup> *Hupp v. Siroflex of Am., Inc.*, 122 F.3d 1456, 1460-61 (Fed. Cir. 1997); *Avia*, 853 F.2d at 1563; *Thom McAn*, 988 F.2d at 1123; *see, e.g., Apple, Inc. v. Samsung Elecs. Co.*, 920 F. Supp. 2d 1079, 1091-92 (N.D. Cal. 2013) (ruling that jury need not have been instructed about functional elements because alternate designs were available).

protected as a group if the design in the entirety is primarily ornamental rather than functional.<sup>98</sup> As such, only the lowest level of abstraction is ever considered with design patents; courts do not ask about the primary focus of the patent to determine subject matter.<sup>99</sup> As discussed in the next section, courts treat utility patents differently.

The result is that design patents are virtually never rejected, not during prosecution, and not in court. This leaves competitors in a difficult position. Their product (or parts of it) may look like the patented design because they perform the same function. How are they to convince the court that the functional similarities should be allowed? Where does functionality end and ornamentality begin?

Patent law currently has few answers. The rule for design infringement is like 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 the prior designs in that field would believe that the accused product is substantially the same as the claimed design.<sup>100</sup> The designs need not be exact; they need only be similar enough that the ordinary observer would find similarity.<sup>101</sup>

As noted above, this standard can be easier to meet than copyright because there need be no proof of copying. Furthermore, current law includes neither the newer abstraction-filtration-comparison test, nor even the older *Nichols*-type abstraction test. Design patent infringement rules do not allow for focus on just those elements that are new, the so-called “point of novelty” of the design.<sup>102</sup>

But the design patent rule could 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 consider

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<sup>98</sup> *Thom McAn*, 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.”).

<sup>99</sup> *Ethicon Endo-Surgery, Inc. v. Covidien, Inc.*, 796 F.3d 1312, 1329 (Fed. Cir. 2015) (“We explained that a claimed design was not invalid as functional simply because the ‘primary features’ of the design could perform functions. [] As with its analysis on other validity grounds, the district court used ‘too a high a level of abstraction’ in assessing the scope of the claimed design.”).

<sup>100</sup> *Gorham Mfg. 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).

<sup>101</sup> *Egyptian Goddess*, 543 F.3d at 672-73.

<sup>102</sup> *Id.*

similarities that are based on preexisting designs.<sup>103</sup> Indeed, some courts have also filtered out functional elements when testing for design patent infringement.<sup>104</sup> Such filtration would expressly protect ornamental elements, but not functional ones.

An example may be helpful. Consider Design Patent No. D604,305,<sup>105</sup> owned by Apple, Inc., pictured below. The patent claims a screen for an electronic device with icons presented on it. The icons are square with rounded corners, and they are tiled four across. The patent includes a row of four icons at the bottom of the screen. In the actual device, we know that these bottom 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 user interface (commonly called “Touch Wiz”) infringed this design patent.<sup>106</sup>



*Figure 1: Samsung TouchWiz (left) compared with D604,305 (right)*

<sup>103</sup> *Egyptian Goddess*, 543 F.3d at 672.

<sup>104</sup> See, e.g., *Richardson v. Stanley Works, Inc.*, 597 F.3d 1288, 1293–94 (Fed. Cir. 2010) (court filtered out functional elements in bench trial); *OddzOn Products, Inc. v. Just Toys, Inc.*, 122 F.3d 1396, 1405 (Fed. Cir. 1997) (construing claim narrowly: “[T]hese functional characteristics do not invalidate the design patent, but merely limit the scope of the protected subject matter.”); *Lee v. Dayton-Hudson Corp.*, 838 F.2d 1186, 1188 (Fed. Cir. 1988) (“Thus it is the non-functional, design aspects[s] that are pertinent to determinations of infringement.”).

<sup>105</sup> U.S. Patent No. D604,305 (filed June 23, 2007).

<sup>106</sup> Amended Verdict Form, *Apple, Inc. v. Samsung Elecs. Co.*, No. 5:11-cv-01846-LHK (N.D. Cal. Aug. 24, 2012), ECF No. 1931, available at <http://www.groklaw.net/pdf3/AppleVsSamsung-1931.pdf>.

At the time of patent application filing, 2007, Apple’s design might have been novel, 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.”<sup>107</sup>

But pieces of the design must have been driven by functional considerations. The bottom row “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.

There was also significant prior art. The idea of a fixed area using different coloring that held frequently used programs was not terribly new in 2007. Microsoft had used something similar since Windows 95,<sup>108</sup> and many “quick launch” program docks were available, and those docks were all a different color than the background.<sup>109</sup> RIM had introduced icons in rows on its Blackberry devices years before the iPhone was released,<sup>110</sup> and Nokia had even provided an interface with square icons aligned in rows.<sup>111</sup> Of course, one had to scroll through the icons rather than touch them, but the arrangement only made scrolling easier. Scrolling is also irrelevant, because this is a design patent — only the appearance matters. Further, Adobe had used square icons with rounded corners for so long that it abandoned them before Apple even applied for its patent.<sup>112</sup> The

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<sup>107</sup> 35 U.S.C. § 171 (2011).

<sup>108</sup> See *Windows 95 Taskbar Screenshot*, WIKIPEDIA (Dec. 2, 2011), [http://en.wikipedia.org/wiki/File:Windows\\_95\\_taskbar\\_screenshot.png](http://en.wikipedia.org/wiki/File:Windows_95_taskbar_screenshot.png).

<sup>109</sup> See, e.g., *Starfish Software’s Sidekick 95*, TELECOMMANDER.COM, <http://www.telecommander.com/pics/links/application%20software/corel/Corel%20Office%20Pro%20V7/Corel%20Office%20Professional%20V7.htm> (last visited July 29, 2018).

<sup>110</sup> Bruce Brown, *RIM BlackBerry 7230 Review & Rating*, PCMAG.COM (Oct. 1, 2003), <http://www.pcmag.com/article2/0,2817,1265089,00.asp>; see also Du Mont & Janis, *supra* note 78, at 129–30 (noting that RIM’s design patent for rows of icons is one of the most cited design patents).

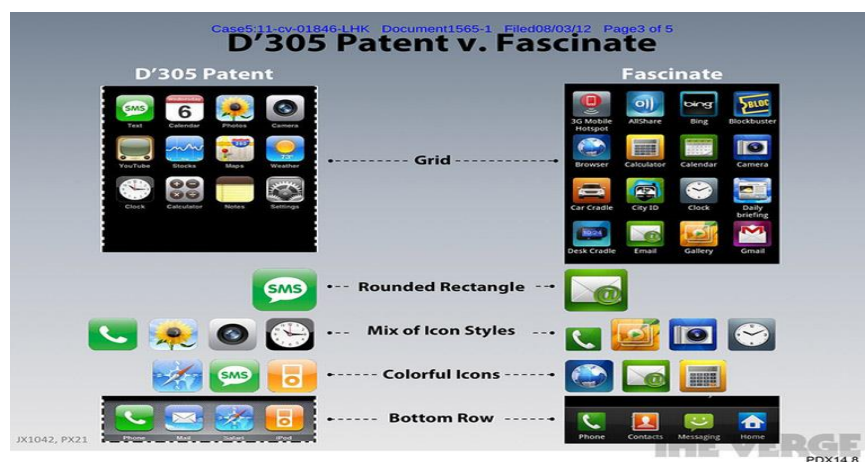
<sup>111</sup> Marek Lutonsky, *Nokia 6681 Review: Extra Style*, GSMARENA.COM (May 8, 2005), [http://www.gsmarena.com/nokia\\_6681-review-38p3.php](http://www.gsmarena.com/nokia_6681-review-38p3.php).

<sup>112</sup> Prescott Perez-Fox, *Out with the Old*, PRESCOTT’S DESIGN BLOG (Dec. 17, 2006, 2:14 PM), <https://web.archive.org/web/20101118104542/http://www.perezfox.com/2006/12/17/out-with-the-old> (last visited July 29, 2018).

Federal Government had even recommended square icons with rounded corners for icons in vehicle displays.<sup>113</sup>

However, it is difficult to argue that Apple's *entire* design is functional or in the prior art. Only some of the basic ideas and other aspects are functional or preexisting. For example, courts should not let a competitor reuse the exact icons, in the exact order, of those in the patented design. The difficulty is determining which designs that are not identical should infringe. This case provides an excellent vehicle to show abstraction-filtration-and comparison because Apple argued that Samsung's use of high level abstractions were infringing, and won.

The Touch Wiz interface shown in Figure 1 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.<sup>114</sup>



**Figure 2:** Exhibit showing levels of abstraction in Apple GUI design

<sup>113</sup> See FEDERAL HIGHWAYS ADMINISTRATION, IN-VEHICLE DISPLAY ICONS AND OTHER INFORMATION ELEMENTS, VOLUME I: GUIDELINES, FHWA-RD-03-065, 4-4 (2004), available at <http://www.fhwa.dot.gov/publications/research/safety/03065/03065.pdf>.

<sup>114</sup> Exhibit A of Samsung's Submission in Response to Aug. 2 Order at 3, Apple, Inc. v. Samsung Elecs. Co., No. 5:11-cv-01846-LHK (N.D. Cal. Aug. 2, 2012), ECF No. 1565-1.

Apple argued that Samsung infringed because it used a grid, rounded rectangles, mixes of icon styles, colorful icons, and a bottom row with offsetting background. These are functions — ideas, ergonomics, and 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.

Based on the differences between the claim and the accused display, the only way Samsung could infringe would be at a higher level of abstraction — the structure and sequence itself. Abstraction, filtration, and comparison is perfectly suited for the task. Apple had already done some abstracting. The next step is filtration. The first level to be removed is the rounded rectangle; it already existed in the prior art. Similarly, lining the icons in a grid would be filtered. This is in the prior art, and functional as well. Third, the court might consider filtering the notion of colorful icons unless the express designs were too similar. Not only did such icons exist, but on a color screen such icons would be functional. Similarly, while a particular mix of icon styles might be protected, the idea of a mix of icon styles would be filtered as functional. In a screen display (which is claimed here), it would make no sense for all the icons to be identical. A primary remaining feature is the bottom row with offsetting colors. This too might see some filtering for the idea of an offsetting color (which is in the prior art), but the prior art is not terribly similar to Apple's claimed look and that might remain in large part.

This type of filtering could have been achieved under current Federal Circuit guidance. The court would have instructed the jury a) not to consider elements of the prior art or functionality (of which these examples would have been submitted), and b) but that it should consider as a whole the ornamental parts of the design in light of those elements. Such an instruction would not fully exclude any part of the design, but would also make the jury cognizant that it should be focused on the novel, non-functional design as it compared the two. In other words, the jury would receive an explicit instruction to consider the ornamental features as a whole in light of the unprotectability of some of the features.

Instead, the court provided no jury instruction about functionality at all. With respect to the '305 patent, the court's instruction to the jury stated:

The D'305 Patent claims the ornamental design for a graphical user interface for a display screen or portion thereof, as shown in Figures 1-2. The broken line showing of a display screen in both views forms no part of the claimed design.<sup>115</sup>

While the jury instructions allowed the jury to consider the prior art, there is no mention whatsoever that infringement cannot be based on functional elements, even though the Federal Circuit had affirmed other courts who had so construed patents.

While Apple, and perhaps the conventional wisdom, believe that Android “copied” the iPhone GUI patent, this was not slavish copying. Furthermore, many of the aspects that were copied were the functional and non-novel aspects. Liability here seems premised on the notion that using the same ideas infringed. This seems to violate the maxim — in use today even as applied to design patents — “[t]hat which infringes, if after, would anticipate, if earlier.”<sup>116</sup> It is unlikely that any court would say that Samsung’s interface would render Apple’s patent non-novel or obvious if it predated it;<sup>117</sup> Apple would surely claim that the functionality is similar, but the *actual design* differs from the Samsung design in important ways, such as all of the icons having different images.<sup>118</sup> And if the Apple patent would be allowed even if Samsung’s design were prior art, then Samsung should not be considered infringing. Abstraction, filtration, and comparison helps achieve a consistent result.

For another example, consider *Richardson v. Stanley Works*.<sup>119</sup> In that case, the Federal Circuit compared a multipurpose hammer to a design patent. On the surface, there were many similarities, but many of those similarities were driven by functionality. The court noted:

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<sup>115</sup> Final Jury Instructions, *Apple, Inc. v. Samsung Elecs. Co.*, No. 5:11-cv-01846-LHK, \*60 (N.D. Cal. Aug. 21, 2012), ECF No. 1903, available at <http://groklaw.net/pdf3/AppleVsamsung-1903.pdf>.

<sup>116</sup> *Int’l Seaway Trading Corp. v. Walgreens Corp.*, 589 F.3d 1233, 1239 (Fed. Cir. 2009) (quoting *Peters v. Active Manuf’g Co.*, 129 U.S. 530, 537 (1889)) (“Moreover, it has been well established for over a century that the same test must be used for both infringement and anticipation.”). Compare *Int’l Seaway Trading*, 589 F.3d 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, 1303 (Fed. Cir. 2010) (finding infringement of Crocs patent despite relatively small differences from accused clogs).

<sup>117</sup> 35 U.S.C. § 102 (2011).

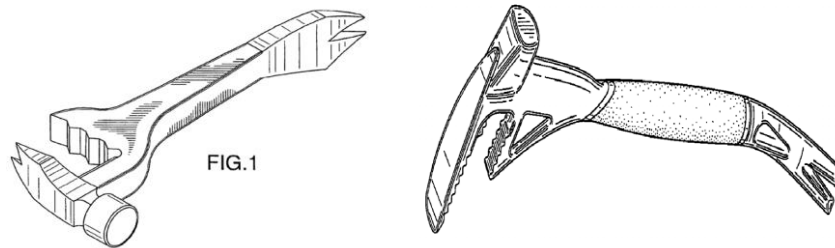
<sup>118</sup> *Int’l Seaway Trading*, 589 F.3d at 1242 (slight differences in dimpling pattern on show insole sufficient to avoid invalidity due to lack of novelty or obviousness).

<sup>119</sup> *Richardson v. Stanley Works, Inc.*, 597 F. 3d 1288, 1293–94 (Fed. Cir. 2010).



The district court here properly factored out the functional aspects of Richardson’s design as part of its claim construction. By definition, the patented design is for a multi-function tool that has several functional components, and we have made clear that a design patent, unlike a utility patent, limits protection to the ornamental design of the article . . . [W]hen 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.<sup>120</sup>

The appeals court thus affirmed the district court’s judgment of non-infringement after a bench trial. The differing posture of the case is important, as the non-jury trial allowed the court some leeway in how it interpreted the patent. It did not need to instruct others how to view the patent.



*Figure 3: The competing multipurpose hammers*

In reality, filtration is much more difficult to achieve under current practices. The Federal Circuit has limited the reach of prior cases that seemed to filter,<sup>121</sup> although the court has continued to rule that functionality can narrow a claim.<sup>122</sup> Compounding this issue, because all

<sup>120</sup> *Id.* at 1293-94.

<sup>121</sup> *Ethicon Endo-Surgery, Inc. v. Covidien, Inc.*, 796 F. 3d 1312, 1334 (Fed. Cir. 2015) (“Thus, although the Design Patents do not protect the general design concept of an open trigger, torque knob, and activation button in a particular configuration, they nevertheless have some scope—the particular ornamental designs of those underlying elements.”); *Sport Dimension, Inc. v. Coleman Co., Inc.*, 820 F. 3d 1316, 1322 (Fed. Cir. 2016) (refusing to eliminate functional elements with little ornamentation: “By eliminating structural elements from the claim, the district court improperly converted the claim scope of the design patent from one that covers the overall ornamentation to one that covers individual elements. Here, the district court erred by completely removing the armbands and side torso tapering from its construction.”); *Apple Inc. v. Samsung Elecs. Co., Ltd.*, 786 F. 3d 983, 998 (Fed. Cir. 2015) (“As such, the language ‘dictated by their functional purpose’ in Richardson was only a description of the facts there; it did not establish a rule to eliminate entire elements from the claim scope as Samsung argues.”).

<sup>122</sup> *Sport Dimension, Inc. v. Coleman Co., Inc.*, 820 F.3d at 1323.

prior art and functionality are submitted to the jury, any filtration is invisible to the record and thus nearly invulnerable to appeal.<sup>123</sup> 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.<sup>124</sup>

The primary objection facing application of abstraction, filtration, and comparison is the Federal Circuit's rejection of the point of novelty test in *Egyptian Goddess*.<sup>125</sup> But this need not be a barrier. As the Court made clear:

Our rejection of the point of novelty test does not mean, of course, that the differences between the claimed design and prior art designs are irrelevant. To the contrary, examining the novel features of the claimed design can be an important component of the comparison of the claimed design with the accused design and the prior art. But the comparison of the designs, including the examination of any novel features, must be conducted as part of the ordinary observer test, not as part of a separate test focusing on particular points of novelty that are designated only in the course of litigation.<sup>126</sup>

Judges should retake a gatekeeping role and filter in every case. Modifying the above quote to add “functionality” would continue to apply the court's ordinary observer test while also mandating that district courts inform juries about functional elements. This is not only consistent with *Egyptian Goddess*, it is expressly contemplated by it.<sup>127</sup> Given the clear guidance in *Egyptian Goddess* and follow-up cases that filtering of functionality will be helpful to the factfinder, as a matter of policy it seems odd to leave the question to the discretion of the court either to not mention functionality at all, or to give no guidance.<sup>128</sup>

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<sup>123</sup> See *Apple, Inc. v. Samsung Elecs. Co.*, 920 F. Supp. 2d 1079, 1089-90 (N.D. Cal. 2013) (adopting deferential standard to jury verdict and assuming jury weighed all prior art).

<sup>124</sup> *Id.* at 1090-91 (“The cases do not suggest that this type of claim construction is appropriate when instructing a jury.”). The district court was affirmed. *Apple Inc. v. Samsung Electronics Co., Ltd.*, 786 F. 3d at 998-99.

<sup>125</sup> *Egyptian Goddess, Inc. v. Swisa, Inc.*, 543 F. 3d 665, 677-78 (Fed. Cir. 2008) (en banc).

<sup>126</sup> *Id.* at 678.

<sup>127</sup> *Id.* 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]).

<sup>128</sup> Indeed, leaving filtering to the jury without guidance requires the appellate court to guess whether any filtering took place to determine whether there was substantial evidence of

This is not to say that instructing a jury will be easy. Filtering does not mean simply removing functional elements from patent drawings with a black marker as if such elements did not exist. Instead, filtering requires the court to instruct the jury about which elements are functional. While it should consider the design as a whole, neither should it give too much (or any) weight to similarities in functional elements. It is no wonder that courts do not want to instruct juries on filtering, but making the attempt is better than the alternative. Indeed, this test has been applied quite usefully in the copyright context while comparing the overall works (rather than element by element). So-called “thinly” copyrighted works require a higher level of similarity to find infringement.<sup>129</sup>

Without 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.<sup>130</sup> Relying on the drawings without filtering leads to the very thing *Egyptian Goddess* disapproves: infringement rulings based not on the drawings but based on the ideas and functions in the drawings.

Thus, courts should compare patented design claims against accused infringers as a whole, but while ensuring that infringement should not be based on similarities due to prior art or functionality. Some district courts have adopted this framework with the Federal Circuit’s approval, and the remaining courts should be instructed to do so.

#### CONCLUSION

The kinship between copyright infringement analysis and patentable subject matter is a secret, misunderstood one, the beleaguered stepchild cleaning floors in the attic. This essay has sought to bring the relationship into the light and create a Cinderella. Though abstraction, filtration, and comparison is not accepted in every circuit, the idea of excluding

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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.

<sup>129</sup> Apple Computer, Inc. v. Microsoft Corp., 35 F.3d 1435, 1442 (9th Cir. 1994) (“Rather, considering the license and the limited number of ways that the basic ideas of the Apple GUI can be expressed differently, we conclude that only ‘thin’ protection, against virtually identical copying, is appropriate. Apple’s appeal, which depends on comparing its interface as a whole for substantial similarity, must therefore fail.”).

<sup>130</sup> *Egyptian Goddess, Inc. v. Swisa, Inc.*, 543 F. 3d at 679.

unprotected subject matter is common, and should be used in both copyright and patent analysis.

With patent law, the fit is easier with design patents than with utility patents. With design patents, unpatentable subject matter — functionality — may be excluded from the infringement comparison. But the tables are turned with patentable subject matter: unpatentable elements are considered only at the protection stage, and the unpatentable is filtered out to see if anything patentable remains.

A key question, then, is why a similar approach shouldn't work with design patents, which are still patents, after all. The answer lies in the lack of claiming, which would identify the elements necessary for infringement. This problem has vexed courts in novelty, obviousness, and claim construction for years, and this essay will not seek to solve it. But so long as design patent claims are a series of drawings, then any patentable subject matter inquiry must take place at the infringement stage, just as it does with copyright. In both cases, virtually everything (except pure function or pure fact, respectively) is protected, and the only way to police subject matter is to abstract, filter, and compare when determining the scope of the right.

Because utility patent claims are based on particular elemental claims, then either all of a claim is protected, or none of it is. It does raise the question for another day: could utility patent subject matter be handled at the infringement stage? If abstract ideas and natural phenomena were filtered out prior to comparing claim elements, perhaps all three systems could coexist under the same infringement framework.