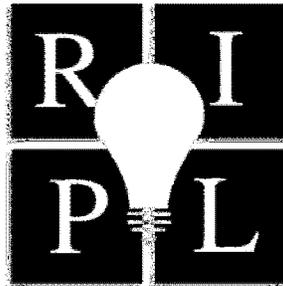


# THE JOHN MARSHALL REVIEW OF INTELLECTUAL PROPERTY LAW



## INTELLECTUAL PROPERTY IMPLICATIONS IN A VIRTUAL REALITY ENVIRONMENT

TIMIR CHHEDA

### ABSTRACT

What will become of intellectual property interests in a world where virtual reality is a fact of life? To ponder this question we must step back from the sophisticated judicially created tests built around a framework of policy suited for modern reality and first consider whether such policy is viable given a virtual reality environment. Only then may we consider if the tests appropriately further such policy, and if not, modify the tests accordingly. This comment considers the policy and tests implicated when copyright, trademark, and patent law pass through the looking-glass and enter the realm of virtual reality.

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# INTELLECTUAL PROPERTY IMPLICATIONS IN A VIRTUAL REALITY ENVIRONMENT

TIMIR CHHEDA\*

## INTRODUCTION

Imagine a world. A world where visions and dreams coalesce in an exquisite fabrication; the product of lines of code written by a programmer and the flair of her imagination.<sup>1</sup> A world unbridled from the chains of physical law that weigh unkindly on the soul. Are we then to impose our man-made laws on such a virtual reality world?<sup>2</sup> Of course.<sup>3</sup> One may still quote The Bard, still recognize the rabbit with the bowtie, and still solve a Rubik's Cube<sup>4</sup> in such a place. Hence copyrights,<sup>5</sup>

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\* Juris Doctor Candidate, May 2006, The John Marshall Law School, Chicago, Illinois; Bachelor of Science, Electrical Engineering, May 2003, The University of Texas, Austin, Texas. The author would like to thank John Gabala, Dan Lechleiter, and the John Marshall Review of Intellectual Property Law community.

<sup>1</sup> *But cf.* The Natural History Museum, *Virtual Reality at the NHM*, at <http://www.nhm.ac.uk/interactive/vrml/> (last visited Sept. 30, 2004) (noting that a physical object may be scanned with a laser to produce a virtual replication). This opposes the premise of any skill or creativity implemented by the programmer.

<sup>2</sup> Wendy J. Gordon et al., Transcript, *The Herbert Tenzer Memorial Conference: Copyright in the Twenty-First Century: Virtual Reality, Appropriation, and Property Rights in Art: A Roundtable Discussion*, 13 CARDOZO ARTS & ENT. L.J. 91, 91-92 (1994). Please assume, arguendo, perfect replication of every sense in a virtual reality environment.

Virtual reality is user-interfacing technology that tracks the kinetic movement, changes, and reactions in the body of an operator using devices that provide comprehensive and exclusive sensory excitation (in the sense that perceptual input from outside the system is excluded as much as possible). The technology simultaneously allows information and commands to be input back into the system as effortlessly as possible. Virtual reality can be thought of as total sensory immersion in the input and output of a computer system: everything one sees, feels, and hears comes from the computer, and everything the user does goes back in. It's an interactive illusion. Some of the devices currently being developed include gloves, complete field-of-vision "viewers" or "head-mounted displays," dual-source sound systems that mimic the effect of three-dimensional sound, body suits, magnetic field trackers, prosthetic and robotic devices and holographic projectors.

*Id.*

<sup>3</sup> *See* UMG Recordings, Inc. v. MP3.com, Inc., No. 00 Civ. 472 JSR, 2000 U.S. Dist. LEXIS 13293, at \*18 (S.D.N.Y. Sept. 6, 2000) ("[C]ompanies operating in the area of the [i]nternet may have a misconception that, because their technology is somewhat novel, they are somehow immune from the ordinary application of the laws of the United States, including copyright law. They need to understand that the law's domain knows no such limits."). This reasoning readily applies to virtual reality technology.

<sup>4</sup> *See* Rubik's Official Online Site, *Brief History of the Cube*, at [http://www.rubiks.com/lvl3/index\\_lvl3.cfm?lan=eng&lvl1=inform&lvl2=medrel&lvl3=history](http://www.rubiks.com/lvl3/index_lvl3.cfm?lan=eng&lvl1=inform&lvl2=medrel&lvl3=history) (last visited Sept. 30, 2004); Hungarian Patent No. 170 062 (issued Oct. 28, 1976) available at [http://pipacsweb.hpo.hu/piaopt/pia05\\_02.htm?v=hunpia&a=start](http://pipacsweb.hpo.hu/piaopt/pia05_02.htm?v=hunpia&a=start) (last visited Sept. 30, 2004).

<sup>5</sup> "Copyright protection subsists, in accordance with this title, in original works of authorship fixed in any tangible medium of expression, now known or later developed, from which they can be

trademarks,<sup>6</sup> and patents<sup>7</sup> still have value even though an alleged infringer does not directly appropriate anything, but indirectly appropriates by utilizing lines of code to represent the subject of the infringement. Whenever a hint of value exists, someone will seek to protect that value.<sup>8</sup> Thus, in a world not grounded in physicality, intellectual property<sup>9</sup> (“IP”) law is king.

This comment argues that copyright, trademark, and patent law will make a smooth expansion into a virtual reality environment because of legislative foresight,<sup>10</sup> the current trend to expand the scope of protected interests,<sup>11</sup> and the probability of using a virtual reality environment for commerce.<sup>12</sup> Although IP law encompasses a wide variety of ideas,<sup>13</sup> only copyright, trademark, and patent implications are considered.

Part I provides an overview of pertinent policies regarding expansion. Part II uses a hypothetical scenario to analyze multiple infringement claims in a virtual reality environment. Part III proposes virtual reality licenses (“VRLs”) and a two step plan to implement them. Part IV concludes with a summarization of significant points.

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perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device.” 17 U.S.C. § 102(a) (2000).

<sup>6</sup> 15 U.S.C. § 1127 (2000).

The term “trademark” includes any word, name, symbol, or device, or any combination thereof—(1) used by a person, or (2) which a person has a bona fide intention to use in commerce . . . to identify and distinguish his or her goods . . . from those manufactured or sold by others and to indicate the source of the goods, even if that source is unknown.

*Id.*

<sup>7</sup> “Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.” 35 U.S.C. § 101 (2000).

<sup>8</sup> *E.g.*, *Feist Publ’ns v. Rural Tel. Serv. Co.*, 499 U.S. 340, 344 (1991) (claiming infringement of mere facts in a phone book).

<sup>9</sup> “[I]ntellectual property[.] . . . A category of intangible rights protecting commercially valuable products of the human intellect . . . . The category comprises primarily trademark, copyright, and patent rights, but also includes trade-secret rights, publicity rights, moral rights, and rights against unfair competition.” BLACK’S LAW DICTIONARY 813 (7th ed. 1999).

<sup>10</sup> *E.g.*, 17 U.S.C. § 102 (2000) (protecting “any tangible medium of expression, now known *or later developed*”) (emphasis added).

<sup>11</sup> Amy B. Cohen, *When Does a Work Infringe the Derivative Works Right of a Copyright Holder?*, 17 CARDOZO ARTS & ENT. L.J. 623, 626–28 (1999) (observing a trend of expansion of copyright law); Naomi Abe Voegtli, *Rethinking Derivative Rights*, 63 BROOKLYN L. REV. 1213, 1233 (1997) (observing a trend of expansion of derivative rights).

<sup>12</sup> *See, e.g.*, *Amazon.com v. Barnesandnoble.com*, 239 F.3d 1343, 1347 (Fed. Cir. 2001) (alleging a patent infringement for a shopping feature of a website). Because the internet has been adopted as a tool for commerce, and the internet and a virtual reality environment could share the commerce-conducive characteristic of worldwide instantaneous access to stored information, it is probable that a virtual reality environment will be used for commerce.

<sup>13</sup> BLACK’S LAW DICTIONARY 813 (7th ed. 1999).

## I. BACKGROUND OF RELEVANT POLICIES

Parts I.A–C discuss relevant policies and defenses for copyright, trademark, and patent infringement respectively. IP policy should constitute the prime consideration in an infringement analysis rather than mechanically applying the tests used to further those policies.<sup>14</sup>

### A. Copyright Law

Copyright law is a statutory creature<sup>15</sup> birthed by the Constitution,<sup>16</sup> and the law's purpose is primarily driven by policy concerns rather than capitalist notions.<sup>17</sup> Therefore, public policy must act as the backdrop against which a virtual reality copyright scheme is analyzed.<sup>18</sup>

A copyright holder only possesses limited rights over her work rather than limitless control.<sup>19</sup> Therefore, pigeonholing a software representation of a validly copyrighted physical object into one of these limited categories of rights determines infringement.<sup>20</sup> More importantly, the policies behind why the following rights in particular command significance determine whether the software representation of a physical object merits copyright protection: the exclusive right (1) to reproduce the copyrighted work; (2) to prepare derivative works based upon the copyrighted work; (3) to distribute copies to the public by transfer of ownership.<sup>21</sup> The question considered in Parts II.A–B is whether a virtual reality representation of a copyrighted physical object can be categorized as infringing one of these rights.

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<sup>14</sup> *Wolfe v. Dept. of Health & Human Services*, 839 F.2d 768, 774 (D.C. Cir. 1988) (citing cases in support of a policy approach rather than a mechanistic test application); *Erringer v. Thompson*, 189 F. Supp. 2d 984, 992 (D. Ariz. 2001) (considering policy even with the presence of a relevant three-part test). *But see Sony Corp. of Am. v. Universal City Studios*, 464 U.S. 417, 456 (1984) (“It may . . . be that Congress will take a fresh look at this new technology . . . . But it is not our job to apply laws that have not yet been written. Applying the copyright statute . . . to the facts as they have been developed in this case, the judgment . . . must be reversed.”).

<sup>15</sup> *Sony*, 464 U.S. at 431.

<sup>16</sup> U.S. CONST. art. I, § 8, cl. 8 (“The Congress shall have Power . . . To Promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings . . .”).

<sup>17</sup> *Sony*, 464 U.S. at 429 (noting that monopoly privileges are not unlimited or designed to provide a general private benefit; rather the overriding interest is public access to products after protection has expired); *Greenbie v. Noble*, 151 F. Supp. 45, 67 (S.D.N.Y. 1957) (“[R]eward to the owner is a secondary consideration.”).

<sup>18</sup> *Twentieth Century Music Corp. v. Aiken*, 422 U.S. 151, 156 (1975) (suggesting that when technological change imbues literal terms with ambiguity, the Copyright Act should be interpreted with policy in mind) (superseded by statute on other grounds).

<sup>19</sup> *Sony*, 464 U.S. at 432–33 (“This protection has never accorded the copyright owner complete control over all possible uses of his work. Rather, the Copyright Act grants the copyright holder ‘exclusive’ rights to use and to authorize the use of his work in five qualified ways . . . .”) (citation omitted).

<sup>20</sup> 17 U.S.C. § 501 (2000); *see, e.g., Sony*, 464 U.S. at 433 (reiterating that anyone except for the copyright holder who performs one of the actions listed in the copyright statute is an infringer).

<sup>21</sup> 17 U.S.C. § 106 (2000).

The policy-driven charges of “derivative work,”<sup>22</sup> “contributory infringement,”<sup>23</sup> and the defense of “fair use”<sup>24</sup> crystallize the struggle for characterization as one of these limited rights. The owner of a validly copyrighted work possesses the sole right to prepare derivative works.<sup>25</sup> Even though a statute defines derivative works,<sup>26</sup> much litigation has arisen as to what constitutes a derivative work,<sup>27</sup> and the sometimes criticized trend is to expand the definition to encompass more and more works.<sup>28</sup> Thus, the “incentive-access paradigm”<sup>29</sup> provides the first point of contention at which Congress or the courts may choose sides while considering whether to characterize the software representation of a validly copyrighted physical object as a derivative work.<sup>30</sup> A derivative work must (1) incorporate the original work in some form,<sup>31</sup> (2) have substantial similarity to the original work,<sup>32</sup> (3) be a work that the creator of the original would likely develop or license another to develop,<sup>33</sup> and (4) stand on its own apart from the original work.<sup>34</sup> Parts II.A and II.B.2 consider whether the virtual representation of a copyrighted physical object is a derivative work.

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<sup>22</sup> *Id.* § 101 (defining a “derivative work” as a work based upon a preexisting work or any recasting, transformation, or adaptation of an original work).

<sup>23</sup> *A&M Records v. Napster, Inc.*, 239 F.3d 1004, 1019 (9th Cir. 2001) (defining a contributory infringer as “one who, with knowledge of the infringing activity, induces, causes or materially contributes to the infringing conduct of another . . . .”) (quoting *Gershiwin Publ’g Corp. v. Columbia Artists*, 443 F.2d 1159, 1162 (2d Cir. 1971)).

<sup>24</sup> 17 U.S.C. § 107 (2000) (“Notwithstanding the provisions of sections 106 and 106A, the fair use of a copyrighted work . . . is not an infringement of copyright.”).

<sup>25</sup> *Id.* § 106.

<sup>26</sup> *Id.* § 101 (defining a “derivative work” as a work based upon a preexisting work or any recasting, transformation, or adaptation of an original work).

<sup>27</sup> *See King Features Syndicate v. Fleischer*, 299 F. 533, 535 (2d Cir. 1924) (holding that even an adaptation and recasting of two dimensional pictures into a three dimensional toy was infringement because “[d]oing this is omitting the work of the artisan, but appropriating the genius of the artist.”); *Rogers v. Koons*, 751 F. Supp. 474, 477 (S.D.N.Y. 1990) (holding that a sculpture based on a photograph is a derivative work).

<sup>28</sup> *See Stewart E. Sterk, Rhetoric and Reality in Copyright Law*, 94 MICH. L. REV. 1197, 1198 (1996) (attributing the expansion of copyright law to interest groups which control the nation’s elite); Voegtli, *supra* note 11, at 1268–69 (calling for a reduction in the scope of derivative rights).

<sup>29</sup> *See Cohen, supra* note 11, at 625 (citing Glynn Lunney, Jr., *Reexamining Copyright’s Incentives-Access Paradigm*, 49 VAND. L. REV. 483, 485 (1996) (noting that a broader scope of copyright will increase the incentive to produce such works and will increase the variety of works, but will limit material available for those works by limiting access and increasing price)).

<sup>30</sup> *See Gerard N. Magliocca, From Ashes to Fire: Trademark and Copyright in Transition*, 82 N.C.L. REV. 1009, 1020 (2004) (observing that as the specter of monopoly leaves trademark and copyright and the shade of property enters, court protection of trademark and copyright interests has increased).

<sup>31</sup> *Vault Corp. v. Quaid Software, Ltd.*, 847 F.2d 255, 267 (5th Cir. 1988) (quoting *Litchfield v. Spielberg*, 736 F.2d 1352, 1357 (9th Cir. 1984)).

<sup>32</sup> *Id.*

<sup>33</sup> *Campbell v. Acuff-Rose Music*, 510 U.S. 569, 592 (1994) (arguing that criticisms such as parody would never belong in the derivative use category because no one would ever license a criticism).

<sup>34</sup> *Lewis Galoob Toys, Inc. v. Nintendo of Am., Inc.*, 780 F. Supp. 1283, 1291 (N.D. Cal. 1991) (describing that, though not within the definition of 17 U.S.C. § 101, independent existence is inherent in the concept of a derivative work; therefore the “Game Genie” which modified the way a video game was played at home was not a derivative work because it could not stand apart from the video game cartridge itself).

Another pertinent policy is the doctrine of contributory infringement, applied when the defendant materially contributes to multiple-consumers' infringement or engages in conduct encouraging the consumers' infringement.<sup>35</sup> The doctrine is invoked to provide a plaintiff the opportunity to hold a single defendant liable rather than spending significant resources trying to join a large number of parties to the case.<sup>36</sup> Parts II.A and II.B.3 consider whether contributory infringement using virtual reality is a valid cause of action.

Because of the high probability of success of a derivative work claim<sup>37</sup> the affirmative defense<sup>38</sup> of fair use, which is a mixed question of law and fact,<sup>39</sup> has enjoyed a parallel rise in significance.<sup>40</sup> The absence of a precise definition of fair use,<sup>41</sup> suggests a case-by-case approach that turns on questions of policy and balances the interests of parties and society.<sup>42</sup> A court takes these policies and interests into account by considering the following fair-use factors:

- (1) the purpose and character of the use, including whether such use is of a commercial nature or is for nonprofit educational purposes;
- (2) the nature of the copyrighted work;
- (3) the amount and substantiality of the portion used in relation to the copyrighted work as a whole; and
- (4) the effect of the use upon the potential market for or value of the copyrighted work.<sup>43</sup>

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<sup>35</sup> *A&M Records v. Napster, Inc.*, 239 F.3d 1004, 1019 (9th Cir. 2001) (defining a contributory infringer as "one who, with knowledge of the infringing activity, induces, causes or materially contributes to the infringing conduct of another . . .") (quoting *Gershwin Publ'g Corp. v. Columbia Artists*, 443 F.2d 1159, 1162 (2d Cir. 1971)).

<sup>36</sup> *In re Aimster Copyright Litig.*, 334 F.3d 643, 645–646 (7th Cir. 2003) (recognizing the futility of trying to sue each individual consumer, and the practicality of finding one defendant liable who was significantly responsible for the infringement as an aider or abettor).

<sup>37</sup> Voegtli, *supra* note 11, at 1216.

<sup>38</sup> *Campbell*, 510 U.S. at 590 (1994) (noting that Congress and another case have recognized fair use as an affirmative defense).

<sup>39</sup> *Sega Enters. v. Accolade, Inc.*, No. 92-15655, 1993 U.S. App. LEXIS 78, at \*32 (9th Cir. Jan. 6, 1993).

<sup>40</sup> *See id.* at \*2 (holding that disassembly of a computer program when no other means of access to uncopyrightable elements exist is a fair use); *Harper & Row, Publishers, Inc. v. Nation Enters.*, 471 U.S. 539, 569 (1985) (holding that quotations from a book in a newspaper article was not a fair use because of its verbatim nature and impact on the sales of the book not yet published).

<sup>41</sup> *Sony Corp. of Am. v. Universal City Studios, Inc.*, 464 U.S. 417, 455 n.31 (1984) (calling for a balancing of interests test when considering the fair use doctrine) ("Although the courts have considered and ruled upon the fair use doctrine over and over again, no real definition of the concept has ever emerged.") (citation omitted).

<sup>42</sup> *Sony*, 464 U.S. at 455 n.40 (calling for a balancing of interests test when considering the fair use doctrine); *Harper*, 471 U.S. at 560 ("each case raising the question must be decided on its own facts") (citation omitted).

<sup>43</sup> 17 U.S.C. § 107 (2000); *see also Harper*, 471 U.S. at 560 (The statutory factors are not exclusive. Rather, the doctrine of fair use is in essence "an equitable rule of reason." (quoting H.R. REP. NO. 94-1476 (1976), *reprinted in* 1976 U.S.C.C.A.N. 5659, 5679)).

Under the first factor, purpose and character of use, a non-commercial use implies non-infringement to promote research, education, and other activities in the public interest.<sup>44</sup> Indeed, this defense is not available when it would “stifle the very creativity which [Copyright] law is designed to foster.”<sup>45</sup> However, the absence of pecuniary gain alone is not indicative of a non-commercial use.<sup>46</sup> Rather, a “repeated and exploitative copying of copyrighting works” suffices as a commercial use.<sup>47</sup> Also, non-profit characteristics that lie in the public interest of the allegedly infringing product may rebut a charge of purely commercial use.<sup>48</sup>

Under the second factor, the nature of the work, informational<sup>49</sup> and educational<sup>50</sup> works receive broad interpretations of fair use (hence a lower likelihood of infringement), while creative works receive narrow interpretations of fair use<sup>51</sup> (hence a higher likelihood of infringement) because of concern for the free flow of information.<sup>52</sup>

Under the third factor, amount of the work used in relation to the whole, courts compare the differences in the quantity and value of the materials used in each of the two works.<sup>53</sup> Furthermore, the characterization of the allegedly infringing work as a verbatim copy of the original work may be considered in order to determine the significance of the transformative character contemplated in the first factor.<sup>54</sup> However, even an exact copy is not determinative of the issue per se.<sup>55</sup>

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<sup>44</sup> See *Harper*, 471 U.S. at 562 (observing that a commercial purpose will weigh against a finding of fair use).

<sup>45</sup> *Stewart v. Abend*, 495 U.S. 207, 236 (1990) (alluding to U.S. CONST art. I, § 8, cl. 8) (citation omitted).

<sup>46</sup> *A&M Records v. Napster, Inc.*, 239 F.3d 1004, 1015 (9th Cir. 2001) (finding that a music distributor’s absence of pecuniary gain did not preclude a finding of non-commercial use especially when other benefits were present).

<sup>47</sup> *Id.*

<sup>48</sup> *Hustler Magazine, Inc. v. Moral Majority, Inc.*, 796 F.2d 1148, 1152–53 (9th Cir. 1986).

<sup>49</sup> *Consumers Union of United States, Inc. v. Gen. Signal Corp.*, 724 F.2d 1044, 1049 (2d Cir. 1983) (finding that the informative nature of CONSUMER REPORTS magazine leaned against a finding of infringement).

<sup>50</sup> See *Iowa State Univ. Research Found., Inc. v. Am. Broad. Co.*, 621 F.2d 57, 62 (2d Cir. 1980) (relying more on original owner’s intention to profit than infringer’s characterization of the work as educational to deny fair use).

<sup>51</sup> *Rogers v. Koons*, 751 F. Supp. 474, 480 (S.D.N.Y. 1990).

<sup>52</sup> *Consumers*, 724 F.2d at 1049.

<sup>53</sup> *Campbell v. Acuff-Rose Music*, 510 U.S. 569, 586 (1994) (using the amount and substantiality test and noting a quantity and value test may also be used).

<sup>54</sup> *Id.* at 587 (considering that a work primarily consisting of the original work reveals a dearth of transformative character in the first factor and thus merely fulfilling the demand for the original).

<sup>55</sup> *E.g.*, *Sega Enters. v. Accolade, Inc.*, No. 92-15655, 1993 U.S. App. LEXIS 78, at \*49 (9th Cir. Jan. 6, 1993) (citing authority which finds even an entire copy does not preclude a finding of fair use, especially if the use was limited). Compare *Sony Corp. of Am. v. Universal City Studios*, 464 U.S. 417, 449–50 (1984) (holding that the practice of “time-shifting,” taping a television program for later viewing, was non-commercial and non-profit fair use even though the entire work was copyrighted, especially when the viewer was invited to see the original showing free of charge), and *Recording Indus. Ass’n of Am. v. Diamond Multimedia Sys.*, 180 F.3d 1072, 1079 (9th Cir. 1999) (holding that “space-shifting,” the process of moving audio songs from a computer hard drive to a portable player, was consistent with a law facilitating personal use), with *A&M Records v. Napster, Inc.*, 239 F.3d 1004, 1019 (9th Cir. 2001) (distinguishing the copying that peer-to-peer networks facilitate from the time and space-shifting in *Diamond* and *Sony* because those shifts did not involve distribution to the public, only original user benefit).

Under the fourth factor, effect of the use, courts find infringement when the use and market for the original product will diminish upon a widespread and unrestricted use of the new product.<sup>56</sup> Unlike the other factors, a finding of significant harm to the complaining party under the fourth factor can be dispositive of an infringement issue.<sup>57</sup> Parts II.A and II.B.2 consider whether the virtual representation of a copyrighted physical object is a fair use.

### *B. Trademark Law*

The mental distance between IP policies and the tests used to further those policies has always remained shortest in trademark law.<sup>58</sup> Indeed, the tests usually consist of the policies themselves.<sup>59</sup> Such tests include: (1) likelihood of consumer confusion,<sup>60</sup> and consequently misallocation of resources; (2) preventing businesses from leeching reputation through an appropriation of another business' intangible

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<sup>56</sup> *Campbell*, 510 U.S. at 590 (noting that the fourth factor requires the court to consider a substantial adverse impact on the potential market for the original if use of the copy was unrestricted and widespread); *Harper & Row, Publishers, Inc. v. Nation Enters.*, 471 U.S. 539, 568 (1985); *Sega*, 1993 U.S. App. LEXIS 78, at \*36.

<sup>57</sup> *Sega*, 1993 U.S. App. LEXIS 78, at \*36 (deeming all other considerations irrelevant if the copied work usurps the original work's market); *Iowa State University Research Foundation, Inc. v. Am. Broad. Cos.*, 621 F.2d 57, 61 (2d Cir. 1980) (quoting Professor Nimmer "(W)here the two works in issue fulfill the same function, scope of fair use is . . . constricted.") (citation omitted).

<sup>58</sup> 15 U.S.C. § 1127 (2000).

The term "trademark" includes any word, name, symbol, or device, or any combination thereof—(1) used by a person, or (2) which a person has a bona fide intention to use in commerce . . . to identify and distinguish his or her goods . . . from those manufactured or sold by others and to indicate the source of the goods, even if that source is unknown.

*Id.*

<sup>59</sup> 15 U.S.C. § 1125 (2000) (Any person who is likely to cause confusion or to deceive as to the affiliation with another person as to the origin, or misrepresents the nature, characteristics, qualities, or geographic origin of his or her or another person's goods shall be liable for infringement).

<sup>60</sup> *See id.* at § 1125 (a)(1)(A).

and unquantifiable goodwill;<sup>61</sup> (3) fostering competition;<sup>62</sup> (4) maintaining quality;<sup>63</sup> and (5) lowering consumer search cost.<sup>64</sup>

Factors some courts have used when analyzing a potential trademark infringement for likelihood of consumer confusion include: (1) the degree of similarity between the marks,<sup>65</sup> (2) the intent of the alleged infringer in adopting its mark,<sup>66</sup> (3) evidence of actual confusion,<sup>67</sup> (4) the relatedness of the products' markets,<sup>68</sup> (5) the degree of care exercised by purchasers (consumer sophistication),<sup>69</sup> and (6) the likelihood of expansion of the product lines by the initial trademark user.<sup>70</sup>

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<sup>61</sup> Stephen L. Carter, *The Trouble With Trademark*, 99 YALE L.J. 759, 763 (1990).

Because the full cost of a good to a consumer equals the price plus the consumer's cost of search, the benefits to the firm are salutary: the more goodwill behind the mark, and the larger the number of consumers who attach a positive association to it, the better off the firm, which will make more sales at a higher price, and the better off the consuming public, which will realize a larger net economy on information costs. And no matter how influential the mark might become, no matter how strong its reputation, there are no additional market language costs. The size of the set of appropriate marks is still reduced by the same amount . . . one mark. Thus, as a mark becomes stronger, the case for permitting its removal from the market language becomes easier to make. As long as the legal system allows only marks that actually represent goodwill to be removed from the available market language, the gains are clear.

*Id.*

<sup>62</sup> *Park 'N Fly, Inc. v. Dollar Park 'N Fly, Inc.*, 469 U.S. 189, 198 (1985).

<sup>63</sup> *Id.*

<sup>64</sup> Carter, *supra* note 61, at 759 ("In theory, legal protection of trademarks provides incentives for firms to make investments aimed at gaining consumer confidence in their marks. Successful marks are like packets of information. They lower consumer search costs, thus promoting the efficient functioning of the market.")

<sup>65</sup> *TCPIP Holding Co. v. Haar Communications, Inc.*, 244 F.3d 88, 100–101 (2d Cir. 2001) (finding the deletion of spaces and punctuation along with the addition of ".net" or ".com" to the original mark adds no significant distinction in the internet arena, nor does the substitution of various articles such as "the" and "a" provide sufficient distinction).

<sup>66</sup> *Carnival Brand Seafood Co. v. Carnival Brands, Inc.*, 187 F.3d 1307, 1311, 1314 (11th Cir. 1999) (finding no bad faith when the alleged infringer attempted to evoke the spirit of Mardi Gras in his product resulting in a similarity of trademarks as opposed to being inspired from the original trademark).

<sup>67</sup> *King of the Mt. Sports, Inc. v. Chrysler Corp.*, 185 F.3d 1084, 1092 (10th Cir. 1999) (finding seven occurrences of actual confusion de minimis in light of the dissimilarity of the marks).

<sup>68</sup> *TCPIP*, 244 F.3d at 102 (finding a proximity of products when the use of the mark is in the same area of commerce).

<sup>69</sup> *Id.* (reasoning that sophisticated consumers are less likely to be misled, but finding that purchasers of children's clothing and users of a web portal searching for children's merchandise were not sophisticated).

<sup>70</sup> *Wynn Oil Co. v. Thomas*, 839 F.2d 1183, 1189 (6th Cir. 1988) (finding no likelihood of expansion).

The defendant in a trademark infringement<sup>71</sup> suit may rebut a *prima facie* showing of likelihood of confusion with evidence of non-confusion<sup>72</sup> by showing that the goods at issue occupy different markets<sup>73</sup> or are simply unrelated.<sup>74</sup> As with the other IP categories, trademark law has a trend of expanding protection<sup>75</sup> as evidenced by the Ninth Circuit's recognition of a property right in a domain name: "First, there must be an interest capable of precise definition; second, it must be capable of exclusive possession or control; and third, the putative owner must have established a legitimate claim to exclusivity. Domain names satisfy each criterion."<sup>76</sup> Parts II.A and II.C consider the use and misuse of trademarks in a virtual reality environment.

### C. Patent Law

Just as in copyright law and trademark law, policy concerns drive the issue of how to best handle patent law implications in a virtual reality environment. Patent infringement analysis rests almost entirely on the scope of patent claim construction, especially when applying the doctrine of equivalents.<sup>77</sup> Of course, one may defend an infringement suit by showing that the alleged infringing object has no equivalent in a

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<sup>71</sup>15 U.S.C. § 1114 (1) (2000).

Any person who shall, without the consent of the registrant -- (a) use in commerce any reproduction, counterfeit, copy, or colorable imitation of a registered mark in connection with the sale, offering for sale, distribution, or advertising of any goods or services on or in connection with which such use is likely to cause confusion, or to cause mistake, or to deceive; or (b) reproduce, counterfeit, copy, or colorably imitate a registered mark and apply such reproduction, counterfeit, copy, or colorable imitation to labels, signs, prints, packages, wrappers, receptacles or advertisements intended to be used in commerce upon or in connection with the sale, offering for sale, distribution, or advertising of goods or services on or in connection with which such use is likely to cause confusion, or to cause mistake, or to deceive, shall be liable in a civil action.

*Id.*

<sup>72</sup> See, e.g., *Daddy's Junky Music Stores v. Big Daddy's Family Music Ctr.*, 109 F.3d 275, 279 (6th Cir. 1997) (defendant contested a likelihood of confusion in general).

<sup>73</sup> See *Union Nat. Bank of Tex., Laredo, Tex. v. Union Nat. Bank of Tex., Austin, Tex.*, 909 F.2d 839, 843 (5th Cir. 1990) (reciting that a trademark owner may not exclude other from using it in an area where she does not do business nor is likely to do business in the future); see also *Terminal Barber Shops v. Zoberg*, 28 F.2d 807, 809 (2d Cir. 1928) (holding that different markets does not implicate the geographic locations of the parties).

<sup>74</sup> *Daddy's*, 109 F.3d at 283 (reiterating that products are related if they perform the same function).

<sup>75</sup> Mark A. Lemley, *The Modern Lanham Act and the Death of Common Sense*, 108 YALE L.J. 1687, 1697, 1705 (1999) (decrying the trend of viewing trademarks as a property interest in themselves rather than referents to the goods they are attached to).

<sup>76</sup> *Kremen v. Cohen*, 337 F.3d 1024, 1030 (9th Cir. 2003) (recounting the saga of *www.sex.com* and finding domain names protectable IP interests).

<sup>77</sup> See, e.g., *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 29 (1997).

claim.<sup>78</sup> Also, if the allegedly infringing product is argued as an improvement to an existing patent, there is a presumption of infringement.<sup>79</sup>

The policy rationale behind the doctrine of equivalents is to discourage an alleged infringer from circumventing a patent claim by making minor alterations and claiming a “new” invention.<sup>80</sup> However, this creates tension with another policy of patent law. The public derives a benefit from knowing the outer bounds of a patent because it need not invest resources in an idea already patented.<sup>81</sup> The inventor is rewarded for this disclosure by the grant of a limited monopoly; the “right to exclude.”<sup>82</sup> However, if the courts use the doctrine of equivalents to imply an outer boundary somewhere vaguely beyond the literal scope of a claim, the first premise of predictability falls and all must fall with it.<sup>83</sup> In implementing the doctrine of equivalents, courts analyze each element of the claim to determine whether the accused product performs a substantially similar function in a substantially similar way to produce a substantially similar result (the “function-way-result” test).<sup>84</sup> Unless the results are obtained in a substantially different manner, using different principles,<sup>85</sup> an improvement of a patented object is presumptively an infringement<sup>86</sup> even if it differs in form.<sup>87</sup> The elasticity inherent in the doctrine of equivalents makes the doctrine the most likely method of attack for an infringement in a virtual reality environment. Parts II.A and II.D consider patent implications in a virtual reality environment.

## II. ANALYSIS

Part II.A narrates a hypothetical set of facts to which the policies discussed above have ready application. Parts II.B–D apply those policies to the facts in an analysis of copyright, trademark, and patent infringement respectively.

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<sup>78</sup> *EMI Group N. Am. v. Intel Corp.*, 157 F.3d 887, 898 (Fed. Cir. 1998) (holding non-infringement because of the lack of equivalence).

<sup>79</sup> *See, e.g., Temco Elec. Motor Co. v. Apco Mfg. Co.*, 275 U.S. 319, 328 (1928) (noting that an improver without a license is presumptively an infringer).

<sup>80</sup> *EMI*, 157 F.3d at 896 (Fed. Cir. 1998) (holding that differentially thermally grown oxide on top of the gate of a MOSFET was not a minor alteration, and sufficiently dissimilar from prior art to find non-infringement).

<sup>81</sup> *See, e.g., Nautilus Group, Inc. v. Icon Health & Fitness, Inc.*, 308 F. Supp. 2d 1217, 1222 (W.D. Wash. 2003).

<sup>82</sup> 35 U.S.C. § 154 (2000); *see also Huszar v. Cincinnati Chem. Works, Inc.*, 172 F.2d 6, 10 (6th Cir. 1949) (“We agree that it is the fiat of the Congress that it is part of the consideration for a patent that the public shall, as soon as possible, begin to enjoy its disclosure.”).

<sup>83</sup> *See Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 29 (1997) (justifying the application of the doctrine of equivalents by narrowly applying it to individual elements of the claim rather than the invention as a whole).

<sup>84</sup> *See, e.g., EMI*, 157 F.3d at 896 (Fed. Cir. 1998) (realizing the grave consequences of a “fraud on the patent” resultant in micro alterations).

<sup>85</sup> *Id.* at 898 (precluding a finding of equivalence).

<sup>86</sup> *Temco Elec. Motor Co. v. Apco Mfg. Co.*, 275 U.S. 319, 328 (1928).

<sup>87</sup> *Essex Razor Blade Corp. v. Gillette Safety Razor Co.*, 299 U.S. 94, 98 (1936) (proclaiming that if the difference in form is obvious to any mechanic, the infringement arises because there is no quality of invention).

### A. A Hypothetical Scenario

Please assume the following scenario to facilitate the analysis of copyright, trademark, and patent infringement claims in a virtual reality environment. Mr. Erno Rubik has a current and valid copyright, trademark, and utility patent<sup>88</sup> on his invention, the Rubik's Cube (the "Original Cube").<sup>89</sup> Ms. Sue Dunym works as a programmer for a Virtual Reality Service Provider ("VRSP"), and is inspired by the Original Cube to make a virtual representation (the "Virtual Cube").

After successfully coding the correct texture, look, and movements for the Original Cube without incorporating the now useless mechanical devices used to hold the Original Cube together, she releases the code to her subscribers via her website. Consumers quickly copy the code from her website and spread it at a rapid rate. In the virtual reality environment, users are attracted to the Virtual Cube by the glowing letters appearing above it reading "Rubik's Cube," and they interact with it just as they would outside of the virtual reality environment.

Ms. Dunym does not charge a fee for using her code because she wants to help the burgeoning virtual reality community, she knows the difficulty of fee enforcement, and she knows that her prestige and the VRSP's prestige will increase regardless of a fee. Mr. Rubik sues for infringement of his copyright in the logical toy, of his trademark "Rubik's Cube," and of his patent on the puzzle. What result and why?

### B. Copyright Infringement

Mr. Rubik will allege a violation of three of the exclusive rights of copyright holders: reproduction of the copyrighted work,<sup>90</sup> preparation of a derivative work,<sup>91</sup> and distribution of the copyrighted work to the public.<sup>92</sup> He will also charge Ms. Dunym with contributory infringement.<sup>93</sup>

#### 1. Reproduction of the Copyrighted Work

Is the software representation of a physical object an actual "reproduction" of that physical object? The answer is clearly "yes" from a legal standpoint because it is

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<sup>88</sup> Hungarian Patent No. 170 062 (issued Oct. 28, 1976) *available at* [http://pipacsweb.hpo.hu/piaopt/pia05\\_02.htm?v=hunpia&a=start](http://pipacsweb.hpo.hu/piaopt/pia05_02.htm?v=hunpia&a=start) (last visited Sept. 30, 2004) (The original patent for the Rubik's cube is written in Hungarian.); U.S. Patent No. 4,378,116 (issued Mar. 29, 1983) (patent for a miniature Rubik's Cube). For ease, the patent to the mini-Cube will be referred to instead of the original Hungarian patent. It is by the same inventor but in English. Despite the mini-Cube having eighteen parts instead of twenty-seven, for the purposes of this text the patent will be treated as if it was for the Original Cube.

<sup>89</sup> See Rubik's Official Online Site, *Brief History of the Cube*, *supra* note 4.

<sup>90</sup> 17 U.S.C. § 106 (2000).

<sup>91</sup> *Id.*

<sup>92</sup> *Id.*

<sup>93</sup> See *In re Aimster Copyright Litig.*, 334 F.3d 643, 645–646 (7th Cir. 2003) (alleging contributory infringement against a peer-to-peer network provider); *A&M Records v. Napster, Inc.*, 239 F.3d 1004, 1019 (9th Cir. 2001) (alleging contributory infringement against a peer-to-peer network provider also).

the reproduction of the copyrightable elements at issue<sup>94</sup> provided that actual copying<sup>95</sup> and access<sup>96</sup> can be proven despite the work being reproduced in an entirely different medium.<sup>97</sup> Furthermore, this analysis holds true even if the alleged infringer did not derive profits from her work.<sup>98</sup>

Ms. Dunym cannot deny that she has made a virtual representation of the Original Cube, thus we can say she has reproduced the copyrightable elements of the Original Cube without inquiring as to what they may be. Ms. Dunym also cannot deny access because she was inspired by the Original Cube. Hence, she “reproduced” the Original Cube even though she produced the copyrightable elements in a different medium and did not profit directly from her work.

However, even after such concessions, Ms. Dunym still has the defense of fair use.<sup>99</sup> Interestingly, this marks our first encounter with a Virtual Reality-Intellectual Property Paradox (“VRIPP #1”). One of the policies behind the defense of fair use is to reward the value that the alleged infringer adds to the pre-existing work, such as in a criticism or review.<sup>100</sup> Ideally, the more original elements added, the more value and work the alleged infringer invests, the *less* likely a finding of infringement.<sup>101</sup> However, the more Ms. Dunym works on her code, the more value and originality she adds, the more perfect her replication, the more copyrightable elements she has infringed, the *more* likely a finding of infringement.<sup>102</sup> Thus the fine line separating fair use from infringement becomes a vortex in the virtual reality environment.

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<sup>94</sup> See *King Features Syndicate v. Fleischer*, 299 F. 533, 535 (2d Cir. 1924) (holding that a stuffed doll of a horse character originally appearing in a book of cartoons infringed the copyrightable concept of humor).

<sup>95</sup> See 17 U.S.C. § 106 (2000).

<sup>96</sup> See *Seltzer v. Sunbrock*, 22 F. Supp. 621, 627–28 (S.D. Cal. 1938) (holding that a lack of access to plaintiff’s work indicated no infringement).

<sup>97</sup> See *King*, 299 F. at 535 (“A copy is that which comes so near to the original as to give to every person seeing it the idea created by the original.”) (citation omitted); *Sega Enters. v. Accolade, Inc.*, No. 92-15655, 1993 U.S. App. LEXIS 78, at \*18 (9th Cir. Jan. 6, 1993) (finding computer printouts of code and other computer files as “copies” and hence reproductions as defined by 17 U.S.C. § 106 despite being in a different medium).

<sup>98</sup> *A&M Records v. Napster, Inc.*, 239 F.3d 1004, 1019 (9th Cir. 2001) (finding that a music distributor’s absence of pecuniary gain did not preclude a finding of non-commercial use especially when other benefits were present); *Chappell & Co. v. Costa*, 45 F. Supp. 554, 556 (S.D.N.Y. 1942) (finding that the plaintiff does not have to show pecuniary gain by the defendant to prevail on an infringement claim).

<sup>99</sup> See *Sony Computer Entm’t, Inc. v. Connectix Corp.*, 203 F.3d 596, 609 (9th Cir. 2000) (holding that intermediate copies of copyrighted code was a fair use defense to infringement because it was the only way to access the uncopyrightable elements of the product).

<sup>100</sup> *Estate of Presley v. Russen*, 513 F. Supp. 1339, 1359 n.22 (D.N.J. 1981) (“Unlike a copier, a parodist or satirist adds his own new and creative touches to the original work . . .”); see *Campbell v. Acuff-Rose Music*, 510 U.S. 569, 592 (1994) (arguing that criticism and parody are fair uses).

<sup>101</sup> See *Castle Rock Entm’t v. Carol Publ’g Group*, 150 F.3d 132, 141 (2d Cir. 1998) (“If the secondary use adds value to the original . . . in the creation of new information, new aesthetics, new insights and understandings—this is the very type of activity that the fair use doctrine intends to protect for the enrichment of society.”) (citation omitted).

<sup>102</sup> See *Feist Publ’ns v. Rural Tel. Serv. Co.*, 499 U.S. 340, 349 (1991) (noting that only copyrightable elements may be infringed) (citation omitted).

Software interface cases<sup>103</sup> provide a possible reconciliation of these principles. To the preliminary question “What is the work?” they answer “Not the code that the programmer produces, but the output of the code the programmer intends.”<sup>104</sup> Following this analysis, Ms. Dunym has not in fact added any value to her “work” (i.e., the output of her code) since what she intends with her Virtual Cube is the copyrightable elements of the Original Cube itself, whatever they may be. Under this analysis, if all Ms. Dunym ever intends is an accurate depiction of the Original Cube, she will never add any value no matter how hard she works.

Ms. Dunym will rebut with the assertion that the value of her Virtual Cube lies not in any original element she has added, but is implicit in the fact that the Original Cube has been transplanted into a virtual reality environment. However, we have already seen that the transformation of a work into a different medium does not constitute a fair use.<sup>105</sup> Notwithstanding her loss on this charge, Ms. Dunym will assert the fair use defense to rebut the derivative work charge as well.

## 2. Derivative Work

Mr. Rubik will charge Ms. Dunym with creating a derivative work of his Cube. He will enjoy a presumption of infringement because the derivative-work elements are satisfied and because Ms. Dunym’s software representation is clearly a recasting, transformation, or adaptation of his Cube. The derivative-work elements favor Mr. Rubik because the Virtual Cube incorporates the copyrightable elements of the Original Cube,<sup>106</sup> is substantially similar to the Original Cube,<sup>107</sup> is a work Mr. Rubik would likely develop himself or license another to develop,<sup>108</sup> and stands on its own apart from the Original Cube.<sup>109</sup>

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<sup>103</sup> See generally *Lotus Dev. Corp. v. Borland Int’l*, 49 F.3d 807, 819 (1st Cir. 1995) (holding that a command hierarchy was not copyrightable subject matter by not analyzing the code, rather, the output); *Computer Assocs. Int’l v. Altai, Inc.*, 982 F.2d 693, 707 (2d Cir. 1992) (advocating an abstraction/filtration test to determine the copyrightable elements of a computer program rather than the code itself).

<sup>104</sup> *Id.*

<sup>105</sup> *King Features Syndicate v. Fleischer*, 299 F. 533, 535 (2d Cir. 1924) (holding that even an adaptation and recasting of two dimensional pictures into a three dimensional toy was infringement because “[d]oing this is omitting the work of the artisan, but appropriating the genius of the artist.”); *Rogers v. Koons*, 751 F. Supp. 474, 477 (S.D.N.Y. 1990) (holding that a sculpture based on a photograph is a derivative work).

<sup>106</sup> See *supra* Part II.A. Ms. Dunym will not deny that she has made a virtual representation of the Original Cube, thus we can say she has reproduced the copyrightable elements of the Original Cube without inquiring as to what they may be.

<sup>107</sup> *Id.*

<sup>108</sup> See *Sterk*, *supra* note 28, at 1198 (the growing trend to increase copyright protection will push this factor in favor of Mr. Rubik).

<sup>109</sup> See, e.g., *Lewis Galoob Toys, Inc. v. Nintendo of Am., Inc.*, 780 F. Supp. 1283, 1291 (N.D. Cal. 1991) (describing that, though not within the definition of 17 U.S.C. § 101, independent existence is inherent in the concept of a derivative work; therefore the “Game Genie” which modified the way a video game was played at home was not a derivative work because it could not stand apart from the video game cartridge itself). Unlike the Game Genie the Original Cube is not necessary to enjoy the Virtual Cube, therefore the Virtual Cube stands on its own.

However, Ms. Dunym also has a fair use defense to the derivative work claim. Under the first fair use factor, purpose and character of use,<sup>110</sup> it is conceivable to characterize the nature of Ms. Dunym's work as commercial because she expects her prestige as a programmer to increase along with the prestige of the VRSP.<sup>111</sup> Furthermore, although Ms. Dunym may claim an educational purpose in the Virtual Cube, the Original Cube had the same educational purpose.<sup>112</sup> Hence, this scenario is not akin to the public benefit<sup>113</sup> society receives when an instructor makes a photocopy of Benjamin Zephaniah's poems to illustrate the use of poetic devices, but instead similar to the chill in commerce likely to result from an instructor making a photocopy of a portion of a textbook which would otherwise be sold as educational material.<sup>114</sup>

However, the Virtual Cube may escape the characterization of commercial use because Ms. Dunym's interests lie in helping the virtual reality community at large.<sup>115</sup> Furthermore, Congress may choose to side with Ms. Dunym on this factor because it wishes to promote virtual reality as a science,<sup>116</sup> it finds virtual reality within the public interest to regulate,<sup>117</sup> or it wishes to have the burgeoning technology unimpeded by current property interests that stifle the very creativity the constitutional grant of limited monopoly was designed to foster.<sup>118</sup> Indeed, Ms. Dunym will have a constitutional claim at every stage of every IP analysis.<sup>119</sup> Specifically, that Congress should use this opportunity to reaffirm its commitment to

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<sup>110</sup> 17 U.S.C. § 107 (2000) (articulating the first fair use factor as the purpose and character of the use, including whether such use is of a commercial nature or is for nonprofit educational purposes).

<sup>111</sup> See *supra* Part II.A.

<sup>112</sup> See *Encyclopedia Britannica Educ. Corp. v. Crooks*, 542 F. Supp. 1156, 1178, 1185 (W.D.N.Y. 1982) (finding that the motivation to produce educational materials would be chilled by fair use copying precisely because they are sold for educational instruction, even though Congress intends to protect educational use).

<sup>113</sup> *Sega Enters. v. Accolade, Inc.*, No. 92-15655, 1993 U.S. App. LEXIS 78, at \*35-36 (9th Cir. Jan. 6, 1993) (reserving the power to consider public benefit despite commercial gain by the infringer, and finding that the creation of new video games was precisely the "growth in creative expression . . . the Copyright Act was intended to promote").

<sup>114</sup> See *Encyclopedia*, 542 F. Supp. at 1178, 1185 (finding that the motivation to produce educational materials would be chilled by fair use copying precisely because they are sold for educational instruction, even though Congress intends to protect educational use). *But see* *Princeton Univ. Press v. Michigan Document Servs.*, 99 F.3d 1381, 1389 (6th Cir. 1996) (deciding that the copying of education materials *for profit* was infringement, but suggesting doubt on the issue of copying not for profit).

<sup>115</sup> See *supra* Part II.A.

<sup>116</sup> See U.S. CONST art. I, § 8, cl. 8, 18.

<sup>117</sup> See U.S. CONST art. I, § 8, cl. 3; U.S. CONST art. I, § 8, cl. 18; *Intermountain Broad. & Television Corp. v. Idaho Microwave, Inc.*, 196 F. Supp. 315, 323 (D. Idaho 1961) (discussing the passing of the Federal Communications Act, "there has been a plenary exercise by Congress of the power to occupy and regulate the field of television," and advising on a cautious approach to the recognition of new rights when Congress might deem the industry within the public benefit to regulate).

<sup>118</sup> *Stewart v. Abend*, 495 U.S. 207, 236 (1990) (explaining that a grant of a limited monopoly is incentive for people to be creative).

<sup>119</sup> *Id.*; see also *Eldred v. Ashcroft*, 537 U.S. 186, 219 (2003) (noting that the first amendment also plays a significant role in copyright law).

the progress of science,<sup>120</sup> instead of the pockets of property owners.<sup>121</sup> As a result, whether this factor leans toward either party is ambiguous.

Under the second fair use factor, nature of the work,<sup>122</sup> the nature of the Original Cube is a spatial and logical puzzle expressed in the form of a cube of varying colors.<sup>123</sup> It is educational<sup>124</sup> and creative<sup>125</sup> at the same time. Even though courts give opposite scopes of fair use to the different categories of works,<sup>126</sup> a court will find that the creativity of the Cube outweighs the educational nature because the Cube is not informational as text asserting facts might be.<sup>127</sup> Hence, this factor weighs in favor of Mr. Rubik.

Under the third fair use factor, amount used in relation to the whole,<sup>128</sup> VRIPP #1 appears again to split a seemingly cohesive test symmetrically in two. While it is true that Ms. Dunym's work is a verbatim copy of Mr. Rubik's expression, the materials and quantity of materials used differ extremely.<sup>129</sup> However, because an exact copy does not automatically imply infringement per se,<sup>130</sup> this factor leans slightly toward Ms. Dunym.

<sup>120</sup> *Eldred*, 537 U.S. at 222 (“the Copyright Clause empowers Congress to determine the intellectual property regimes that, overall, in that body's judgment, will serve the ends of the Clause . . . . Congress may implement the stated purpose of the Framers by selecting the policy which in its judgment best effectuates the constitutional aim.”) (citation omitted).

<sup>121</sup> See Sterk, *supra* note 28.

<sup>122</sup> 17 U.S.C. § 107 (2000) (articulating the second fair use factor as the nature of the copyrighted work).

<sup>123</sup> U.S. Patent No. 4,378,116 (issued Mar. 29, 1983).

<sup>124</sup> See Rubik's Official Online Site, *Brief History of the Cube*, *supra* note 4 (Rubik, a university professor, initially used the Cube to illustrate geometry and form manipulation to his students.); W.D. Joyner, *Lecture Notes on the Mathematics of the Rubik's Cube*, at [http://web.usna.navy.mil/~wdj/rubik\\_nts.htm](http://web.usna.navy.mil/~wdj/rubik_nts.htm) (last visited Sept. 30, 2004) (using the Rubik's Cube to teach set and group theory); Patrick Mondout, *Rubik's Cube*, at [http://www.awesome80s.com/Awesome80s/Culture/Fads/Rubiks\\_Cube.asp](http://www.awesome80s.com/Awesome80s/Culture/Fads/Rubiks_Cube.asp) (last visited Sept. 30, 2004) (There are 43,252,003,274,489,856,000 (forty-three quintillion) positions the Cube may assume but only one correct position.).

<sup>125</sup> See *The Perplexing Life of Erno Rubik*, DISCOVER, Mar. 1986 v7 at 81(8), available at <http://www.puzzlesolver.com/puzzle.php?id=29&page=15> (last visited Sept. 30, 2004) (“In its arranged state it suggests calm, peace, a sense of order, security . . . in sharp contrast to all that the work-ing [sic] object means once it is brought to life, to motion. There is something terrifying in its calm state, like a wild beast at rest, a tiger in repose, its power lurking.”—Erno Rubik) (omission in original).

<sup>126</sup> See *Encyclopedia Britannica Educ. Corp. v. Crooks*, 542 F. Supp. 1156, 1178, 1185 (W.D.N.Y. 1982); *Sega Enters. v. Accolade, Inc.*, No. 92-15655, 1993 U.S. App. LEXIS 78, at \*35-36 (9th Cir. Jan. 6, 1993); *Princeton Univ. Press v. Mich. Document Servs.*, 99 F.3d 1381, 1389 (Courts give broader fair uses to creative works, and narrow fair uses to educational work to permit information flow.).

<sup>127</sup> See *Consumers Union of United States, Inc. v. General Signal Corp.*, 724 F.2d 1044, 1049 (2d Cir. 1983) (finding that the informative nature of CONSUMER REPORTS magazine leaned against a finding of infringement).

<sup>128</sup> 17 U.S.C. § 107 (2000) (articulating the third fair use factor as the amount and substantiality of the portion used in relation to the copyrighted work as a whole).

<sup>129</sup> See *supra* Part II.A. The Virtual Cube is most likely made of electricity while the Original Cube is made of a type of plastic.

<sup>130</sup> *E.g.*, *Sega Enters. v. Accolade, Inc.*, No. 92-15655, 1993 U.S. App. LEXIS 78, at \*49 (9th Cir. Jan. 6, 1993) (citing authority which finds even an entire copy does not preclude a finding of fair use, especially if the use was limited).

Under the fourth fair use factor, effect of use,<sup>131</sup> the value of the Rubik's Cube is wholly appropriable in a virtual reality environment,<sup>132</sup> thus eliminating the incentive to purchase the Original Cube. Perfect replication of all senses in a virtual reality environment would theoretically appropriate the value of everything except that which gives value for having effected a physical change in a regular environment. For example, while one might satisfy the urge to paint a house in a virtual environment, one may only satisfy the urge of having a house of a different color in a regular environment. The mental exercises and entertainment that the Cube provides are not in such a category. Thus, Mr. Rubik will suffer significant harm, especially considering a widespread and unrestricted use of the Virtual Cube.<sup>133</sup> Hence, this factor leans heavily in favor of Mr. Rubik. Also, because this factor has the potential to override the others,<sup>134</sup> a judge or jury will likely declare a finding of derivative work here.

### 3. *Distributing the Copyrighted Material and "Contributory Infringement"*

Mr. Rubik will allege that Ms. Dunym distributed his copyrighted material and contributed to the infringement of his work by others.<sup>135</sup> The first charge is clear. Because Ms. Dunym has uploaded the Virtual Cube onto her website, she has infringed Mr. Rubik's right to distribute,<sup>136</sup> and the users that downloaded the Virtual Cube have infringed Mr. Rubik's right to reproduction.<sup>137</sup>

However the second charge is hazier; may Mr. Rubik impute the users' encroachment to Ms. Dunym via the charge of contributory infringement? Only if Ms. Dunym has actual or constructive knowledge<sup>138</sup> of users' infringing uses and Ms. Dunym herself has materially contributed to the infringing activity.<sup>139</sup> Because Ms. Dunym purposefully put the Virtual Cube on her website,<sup>140</sup> and cannot prove a

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<sup>131</sup> 17 U.S.C. § 107 (2000) (articulating the fourth fair use factor as the effect of the use upon the potential market for or value of the copyrighted work).

<sup>132</sup> See *A&M Records v. Napster, Inc.*, 239 F.3d 1004, 1014 (9th Cir. 2001) (the value of music can be wholly appropriated by illicit distribution); *supra* Part III.A (noting that a similar distribution is occurring).

<sup>133</sup> See *Campbell v. Acuff-Rose Music*, 510 U.S. 569, 590 (1994); *Harper & Row, Publishers, Inc. v. Nation Enters.*, 471 U.S. 539, 568 (1985); *Sega*, 1993 U.S. App. LEXIS 78, at \*36. (cases which apply the widespread use test).

<sup>134</sup> *Sega*, 1993 U.S. App. LEXIS 78, at \*36 (deeming all other considerations irrelevant if the copied work usurps the original work's market); *Iowa State Univ. Research Found., Inc. v. Am. Broad. Cos.*, 621 F.2d 57, 61 (2d Cir. 1980) (quoting Professor Nimmer "(W)here the two works in issue fulfill the same function, scope of fair use is . . . constricted.") (citation omitted).

<sup>135</sup> See *A&M Records v. Napster, Inc.*, 239 F.3d 1004, 1019 (9th Cir. 2001) (defining a contributory infringer as "one who, with knowledge of the infringing activity, induces, causes or materially contributes to the infringing conduct of another . . .") (quoting *Gershwin Publ'g Corp. v. Columbia Artists*, 443 F.2d 1159, 1162 (2d Cir. 1971)).

<sup>136</sup> *Id.* at 1014 (uploading copyrighted material violates the right to distribution).

<sup>137</sup> *Id.* (downloading copyrighted material violates the right to reproduction).

<sup>138</sup> *Id.* at 1020 (listing actual or constructive knowledge as an element of contributory infringement).

<sup>139</sup> *Id.* at 1022 (listing material contribution to the infringing activity as an element of contributory infringement).

<sup>140</sup> See *supra* Part II.A.

non-infringing use,<sup>141</sup> she has constructive knowledge. Ms. Dunym will erroneously claim that “space-shifting” is a non-infringing use,<sup>142</sup> but her infringement of the right of distribution, as discussed above, will nullify such a rebuttal.<sup>143</sup>

Also, Ms. Dunym provides the location and ability for users to download the Virtual Cube: her website, thus satisfying the material contribution element.<sup>144</sup> Hence, a judge or jury will find Ms. Dunym liable for distributing the copyrighted material in violation of Mr. Rubik’s sole right to do so, as well as contributory infringement.

Considering the various policies and tests, a court will likely find copyright infringement because Ms. Dunym has reproduced the Original Cube, the Virtual Cube is a derivative work, and Ms. Dunym is a contributory infringer.

### *C. Trademark Infringement*

Mr. Rubik will seek to use to his advantage the same test applied by the Ninth Circuit when the Ninth Circuit found a property interest in a domain name.<sup>145</sup> He will argue that his interest in protecting his mark in a virtual reality environment may be precisely defined as the same interest any vendor has in protecting a mark, his mark is capable of exclusive control in the same way marks are under exclusive control in a regular environment, and he has the same legitimate claim to protect his mark in a virtual reality environment as he would in a regular environment. In short, there is no reason to treat trademark law any differently in a virtual reality setting.

Ms. Dunym will rebut that trademark law heralds the second appearance of a Virtual Reality-Intellectual Property Paradox (“VRIPP #2”). Specifically, it takes only two short answers to two trademark questions to obtain divergent results. Is there an appropriation of a trademark? Yes. The entire trademark has been

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<sup>141</sup> See *A&M Records*, 239 F.3d. at 1020–21 (following the Sony decision and reversing the district court when finding that Napster’s file sharing program had a non-infringing use (distributing uncopyrighted material), thus this avenue to show knowledge by Napster was closed).

<sup>142</sup> Compare *Sony Corp. of Am. v. Universal City Studios*, 464 U.S. 417, 449–50 (1984) (holding that the practice of “time-shifting,” taping a television program for later viewing, was non-commercial and non-profit fair use even though the entire work was copyrighted, especially when the viewer was invited to see the original showing free of charge) and *Recording Indus. Ass’n of Am. v. Diamond Multimedia Sys.*, 180 F.3d 1072, 1079 (9th Cir. 1999) (holding that “space-shifting,” the process of moving audio songs from a computer hard drive to a portable player, was consistent with a law facilitating personal use) with *A&M Records v. Napster, Inc.*, 239 F.3d 1004, 1019 (9th Cir. 2001) (distinguishing from the space-shifting in *Diamond* and *Sony* because those shifts did not involve distribution to the public, only original user benefit).

<sup>143</sup> *A&M Records*, 239 F.3d. at 1020–21 (placing the instant scenario squarely under *A&M Records* rather than *Sony* or *Diamond* because of the infringement of the distribution).

<sup>144</sup> *Id.* at 1022 (finding that because Napster provided the “site and facilities” for infringement and without Napster’s services the users could not locate the copyrighted material they sought, material contribution existed).

<sup>145</sup> *Kremen v. Cohen*, 337 F.3d 1024, 1030 (9th Cir. 2003) (“First, there must be an interest capable of precise definition; second, it must be capable of exclusive possession or control; and third, the putative owner must have established a legitimate claim to exclusivity.”).

appropriated unaltered for use in distribution of the Virtual Cube.<sup>146</sup> Is there a likelihood of confusion by the public as to the source of the Virtual Cube? No. No one will falsely assume that Mr. Rubik is the source of anything they encounter in a virtual reality environment because the entire world is simply code changeable at the whim of the VRSP, the programmer herself, or perhaps even any hacker.<sup>147</sup>

The answer to the second question would be straightforward if a virtual reality environment allowed users to buy the goods depicted and have them shipped to their home, as the internet does.<sup>148</sup> In such a case a shopper conceivably could wish to purchase the Original Cube, and believe the Virtual Cube was prepared by Mr. Rubik as a representation of what the shopper would be delivered.<sup>149</sup> Since the heart of trademark law lies in preventing this source confusion, a judge or jury will easily find infringement.<sup>150</sup>

However, the question becomes more complex if a virtual reality environment is not a place of commerce. Assuming so, Ms. Dunym's rebuttal of non-confusion<sup>151</sup> is strengthened because a consumer will not confuse any developer of virtual reality code with a manufacturer of an original physical product. However, this defense must also fail after applying the trademark infringement policies and factors.<sup>152</sup>

Despite Ms. Dunym's altruistic intent,<sup>153</sup> if she does a poor job rendering the Cube, she will have appropriated the goodwill Mr. Rubik has built in his mark because consumers could believe that the defects lie in the Original Cube.<sup>154</sup> This

<sup>146</sup> See *supra* Part II.A (Users are attracted to the Virtual Cube by the words "Rubik's Cube" floating above it.); 15 U.S.C. § 1114 (2000). Even though Ms. Dunym is not selling her good, the attachment of a trademark in mere distribution is enough for infringement. See generally Mary Bellis, *Rubik's Cube—Rubik and the Cube: the History of Rubik's Cube and Inventor Erno Rubik*, at <http://inventors.about.com/library/weekly/aa040497.htm> (last visited Oct. 27, 2004) (It was too late for Rubik to acquire an international patent for the Original Cube so he relies heavily on the trademark to enforce his rights.).

<sup>147</sup> It is possible that a likelihood of confusion would arise if the user does not know she is in a virtual reality environment. That scenario is not considered.

<sup>148</sup> See *Peapod Online Grocery Shopping and Delivery Service*, at <http://www.peapod.com> (last visited Oct. 27, 2004) (shopping for groceries online); *errorwear: embrace your computer problems*, at <http://www.errorwear.com> (last visited Oct. 27, 2004) (shopping for apparel).

<sup>149</sup> This comment does not consider the scenario where the Virtual Cube itself would be for sale.

<sup>150</sup> See 15 U.S.C. § 1125 (2000) (considering trademark statutes appear in Title 15 "Commerce and Trade," such a finding is appropriate).

<sup>151</sup> See *Daddy's Junky Music Stores v. Big Daddy's Family Music Ctr.*, 109 F.3d 275, 279 (6th Cir. 1997) (noting that non-confusion is a defense to a trademark infringement action).

<sup>152</sup> § 1125 (a)(1)(A) (protecting the public from confusing the source of goods); Carter, *supra* note 61, at 759 (preventing businesses from leeching reputation through an appropriation of another business' intangible and unquantifiable goodwill); *Park 'N Fly, Inc. v. Dollar Park 'N Fly, Inc.*, 469 U.S. 189, 198 (1985) (fostering competition and maintaining quality); Carter, *supra* note 61, at 759 (lowering consumer search cost); *TCPIP Holding Co. v. Haar Communications, Inc.*, 244 F.3d 88, 100–101 (2d Cir. 2001) (the degree of similarity between the marks); *Carnival Brand Seafood Co. v. Carnival Brands, Inc.*, 187 F.3d 1307, 1311, 1314 (11th Cir. 1999) (the intent of the alleged infringer in adopting its mark); *King of the Mt. Sports, Inc. v. Chrysler Corp.*, 185 F.3d 1084, 1092 (10th Cir. 1999) (evidence of actual confusion); *TCPIP*, 244 F.3d at 102 (the proximity of products and consumer sophistication); *Wynn Oil Co. v. Thomas*, 839 F.2d 1183, 1189 (6th Cir. 1988) (the likelihood of expansion of the product lines by the initial trademark user).

<sup>153</sup> See *supra* Part II.A (she is interested in helping the burgeoning virtual reality community).

<sup>154</sup> See Carter, *supra* note 61, at 763 (explaining how goodwill is appropriated by trademark infringement).

decline in reputation may adversely affect sales of the Original Cube,<sup>155</sup> as well as give Mr. Rubik less incentive to maintain a high quality standard in the Original Cube.<sup>156</sup> This logical decline in sales tends to establish two things. First, the Virtual Cube is similar to the Original Cube and Mr. Rubik has an interest in developing the Virtual Cube in order to protect his mark: "Rubik's Cube."<sup>157</sup> Second, that both cubes occupy similar markets.<sup>158</sup> Indeed, assuming a perfect replication of all senses, it is difficult to imagine how a true rendering would not eliminate demand for the Original Cube entirely.<sup>159</sup>

A decision in favor of Mr. Rubik is likely considering marketers' recent foray into the untapped commercial aspects of in-game advertising.<sup>160</sup> A video game environment is also not a marketplace, indeed it may be said to be the predecessor of virtual reality, yet businesses pay to have their marks appear in them.

The outcome of the property interest analysis and VRIPP #2 notwithstanding, Mr. Rubik will likely prevail in a trademark infringement claim in a virtual reality environment because of the significant loss of demand for the Original Cube, in order to preserve his ability to protect his mark, and the probable use of a virtual reality environment as a marketplace or its use as promotional tool at the very least.

#### *D. Patent Infringement*

Mr. Rubik will allege a patent infringement based on the doctrine of equivalents, and Ms. Dunym will defend on improvement grounds.

<sup>155</sup> See *A&M Records v. Napster, Inc.*, 239 F.3d 1004, 1019 (9th Cir. 2001) (those who downloaded music probably did not buy it). Similarly, among the many that downloaded the Virtual Cube, it is highly likely that many would have bought the Original Cube had the Virtual Cube not existed.

<sup>156</sup> See *Carter*, *supra* note 61, at 763 (Incentive to maintain quality is one of the policies of trademark law. If a competitor can discourage purchases by using a poor product with the same mark, the original mark holder has no incentive to maintain quality because of the confusion.).

<sup>157</sup> *Campbell v. Acuff-Rose Music*, 510 U.S. 569, 592 (1994) (distinguishing criticisms and parodies as something so dissimilar that no one would allow others to develop them).

<sup>158</sup> See *TCPIP Holding Co. v. Haar Communications, Inc.*, 244 F.3d 88, 100–102 (2d Cir. 2001); *Wynn Oil Co. v. Thomas*, 839 F.2d 1183, 1189 (6th Cir. 1988); *Union Nat. Bank of Tex., Laredo, Tex. v. Union Nat. Bank of Tex., Austin, Tex.*, 909 F.2d 839, 843 (5th Cir. 1990); *Daddy's Junky Music Stores v. Big Daddy's Family Music Ctr.*, 109 F.3d 275, 283 (6th Cir. 1997) (cases that discuss similar markets).

<sup>159</sup> See *Campbell*, 510 U.S. at 590; *Harper & Row, Publishers, Inc. v. Nation Enters.*, 471 U.S. 539, 568 (1985); *Sega Enters. v. Accolade, Inc.*, No. 92-15655, 1993 U.S. App. LEXIS 78, at \*36 (9th Cir. Jan. 6, 1993) (cases which apply the widespread use test to support a finding of infringement).

<sup>160</sup> Katy Bachman, *Nielsen, Activision Announce In-Game Ad Test*, *MEDIAWEEK.COM*, Oct. 18, 2004 at [http://www.mediaweek.com/mw/search/article\\_display.jsp?vnu\\_content\\_id=1000673387](http://www.mediaweek.com/mw/search/article_display.jsp?vnu_content_id=1000673387) (reporting that nearly three in ten people said that advertising in video games was more memorable than traditional TV advertising and reporting that the video game Tony Hawk's Underground 2 has a Jeep advertisement.); *Technology Briefing Software: Viacom May Seek Ads In Video Games*, *N.Y. TIMES*, June 18, 2004, at C2 (reporting that Viacom is exploring in-game advertisement opportunities); Greg Thom, *Playing for money - Advertisers tap into \$889m video game earner*, *THE DAILY TELEGRAPH* (Sydney, Australia) May 13, 2004, at T15 (listing a number of video game advertisers including Puma, Quicksilver, Kentucky Fried Chicken, Red Bull, and Samsung advertising in True Crime: Streets of L.A., Tony Hawk Pro Skater 3, Crazy Taxi, Worms 3D, and Enter the Matrix respectively).

Ms. Dunym will concede two factors of the function-way-result test,<sup>161</sup> specifically that the Virtual Cube performs a substantially similar function as that of the Original Cube with a substantially similar result.<sup>162</sup> However, she will argue that those are brought about in an radically different way: through a virtual reality medium. Ms. Dunym will argue against broadening the medium-transference indifference<sup>163</sup> of copyright protection to patent protection for two reasons. First, in order to grant patents to ideas using new technology, courts should strictly construe existing claims.<sup>164</sup> Consequently, Mr. Rubik should be held to his claims, all involving elements of physicality skirted by the Virtual Cube.<sup>165</sup> Second, the Virtual Cube is not the type of minor alteration of the Original Cube that the doctrine of equivalents is designed to protect.<sup>166</sup>

All of the Original Cube's claims depend on the first claim which involves a physical element: a screw enclosed by a spring to join the cam elements to the toy elements.<sup>167</sup> In fact the claims all contain physical elements which the Virtual Cube is not subject to.<sup>168</sup> Indeed, the brilliance of the Original Cube is arguably in its engineering rather than its concept: the manner in which it is structurally sound yet very mobile on its axes.<sup>169</sup> Because the Virtual Cube does not encompass these

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<sup>161</sup> See, e.g., *EMI Group N. Am. v. Intel Corp.*, 157 F.3d 887, 896 (Fed. Cir. 1998) (a court will find infringement if the alleged infringing product performs substantially the same function, in substantially the same way, with a substantially similar result).

<sup>162</sup> See Rubik's Official Online Site, *Brief History of the Cube*, *supra* note 4. The Virtual Cube has the same function as the Original Cube because they are both logical spatial puzzles designed as a 3 x 3 x 3 Cube of varying colors. They achieve the same result because they both have the ability to intrigue the mind or enhance spatial and memory skills to the user's delight or frustration.

<sup>163</sup> See *King Features Syndicate v. Fleischer*, 299 F. 533, 535 (2d Cir. 1924) (finding the copying of the work in an entirely different medium no bar to infringement).

<sup>164</sup> See, e.g., *Diamond v. Chakrabarty*, 447 U.S. 303, 308 (1980) (allowing a patent for the production of crude-oil eating organisms and finding that life may be "manufactured"); *Diamond v. Diehr*, 450 U.S. 175, 182 (1981) ("[I]n dealing with the patent laws, we have more than once cautioned that courts should not read into the patent laws limitations and conditions which the legislature has not expressed.") (citation omitted).

<sup>165</sup> See U.S. Patent No. 4,378,116 (issued Mar. 29, 1983) (Claim 1 reads: "and means for joining the connecting toy elements to coact with the cam elements to form an integrated toy body, the joining means comprising a *single screw enclosed by a spring*"; claim 2 reads: "having a first *cam element connected to one corner thereof*"; claim 3 reads: "including a rectangular *solid element*"; claim 4 reads: "and a connected *solid element* having a quadratic base, groove with a concave surface disposed along the circumference of the prism in the *solid element*, the quadratic base of the *solid element*" and "wherein the two elements are interconnected by the *screw enclosed by the spring*"; claim 5 reads: "confining faces of the *solid* are each formed by a convex curved surface"; claim 6 reads: "*articulated solids* of generally cubic shape" and "continues along the full length of the *solid and protrudes* from another confining face of the cube, the frontal confining face of the *solid* runs parallel"; claim 7 reads: semi-discs *fixed onto the end* of said cylinders and a flat prism with a *central throughbore*") (emphasis added); *supra* Part III.A (Ms. Dunym did not unnecessarily incorporate any of these internal mechanisms of the Original Cube into the Virtual Cube.).

<sup>166</sup> See, e.g., *EMI Group N. Am. v. Intel Corp.*, 157 F.3d 887, 896 (holding that differentially thermally grown oxide on top of the gate of a MOSFET was not a minor alteration, and hence sufficiently dissimilar from prior art).

<sup>167</sup> U.S. Patent No. 4,378,116 (issued Mar. 29, 1983).

<sup>168</sup> See *id.*

<sup>169</sup> Mary Bellis, *Rubik's Cube—Rubik and the Cube: the History of Rubik's Cube and Inventor Erno Rubik*, at <http://inventors.about.com/library/weekly/aa040497.htm> (last visited Oct. 27, 2004) ("The structural design problem interested Rubik; he asked, 'How could the blocks move

physical elements, and in fact eliminates them,<sup>170</sup> Ms. Dunym's argument gains strength: the Virtual Cube does not infringe strict interpretations of the Original Cube's claims<sup>171</sup> and even eclipses the Original Cube. In this manner Ms. Dunym hopes to tip in her favor the policy of encouraging "inventing around" patents by requiring their disclosure.<sup>172</sup>

Mr. Rubik will rebut that an improvement implies presumptive infringement, even if the form differs, and that the medium-transference indifference<sup>173</sup> in copyright law should apply to patent law. Specifically, Mr. Rubik will argue that Ms. Dunym construes the "way" element of the test<sup>174</sup> too narrowly. The "way" the spatial logical puzzle elements are presented is in a 3 x 3 x 3 cube of varying colors,<sup>175</sup> the Virtual Cube exactly; not a 3 x 3 x 3 cube of varying colors in the physical world with the necessary screws, cams, and spring: the interpretation Ms. Dunym advances.

Ms. Dunym will further rebut that the "way" element of the test does not apply to the whole Original Cube, but merely the inner mechanisms of the Cube which are the thrust of the patent claims.<sup>176</sup> Indeed, there is no equivalent to the inner mechanisms of the Original Cube under the doctrine of equivalents. There is nothing at all.

Ultimately, Congress or the courts will likely side with Mr. Rubik for the same policy<sup>177</sup> reasons applicable to the other IP categories: the grant of a limited monopoly becomes meaningless if another may legally appropriate the entire value of

independently without falling apart?"); Rubik's Official Online Site, *Brief History of the Cube*, *supra* note 4 (recounting the story of how Mr. Rubik made the initial prototype with elastic bands but had to wait for a flash of inspiration for a workable idea of construction).

<sup>170</sup> See *supra* Part II.A (The Virtual Cube has no need for the internal mechanisms of the Original Cube).

<sup>171</sup> See *Novartis Pharms. Corp. v. EON Labs Mfg.*, 234 F. Supp. 2d 464, 467 (D. Del. 2002) ("For there to be infringement under the doctrine of equivalents, the accused . . . process must embody every element of a claim, either literally or by an equivalent . . . [S]howing that an accused device is equivalent overall to the claimed invention is insufficient to establish infringement under the doctrine of equivalents.").

<sup>172</sup> See *Huszar v. Cincinnati Chem. Works, Inc.*, 172 F.2d 6, 10 (6th Cir. 1949) (one of the ways the public enjoys disclosure is that it knows not to invest resources in what has already been patented).

<sup>173</sup> See *King Features Syndicate v. Fleischer*, 299 F. 533, 535 (2d Cir. 1924) (holding that even an adaptation and recasting of two dimensional pictures into a three dimensional toy was infringement because "[d]oing this is omitting the work of the artisan, but appropriating the genius of the artist."); *Rogers v. Koons*, 751 F. Supp. 474, 477 (S.D.N.Y. 1990) (holding that a sculpture based on a photograph is a derivative work).

<sup>174</sup> *EMI Group N. Am. v. Intel Corp.*, 157 F.3d 887, 896 (Fed. Cir. 1998) (a court will find infringement if the alleged infringing product performs substantially the same function, in substantially the same way, with a substantially similar result).

<sup>175</sup> See *Rubik's Cube-Java Version*, at [http://www.johnrausch.com/PuzzleWorld/app/rubiks\\_cube/rubiks\\_cube.htm](http://www.johnrausch.com/PuzzleWorld/app/rubiks_cube/rubiks_cube.htm) (last visited Oct. 27, 2004); *Magic Cube 4D*, at <http://www.superliminal.com/cube/cube.htm> (last visited Oct. 27, 2004) (a four dimensional cube); *Fun-Rubik's-Cube-Virtual Cubes*, at <http://www.randelshofer.ch/rubik/virtualcubes/index.html> (last visited Oct. 27, 2004) (a predecessor to the Virtual Cube which may actually be taken apart piece by piece).

<sup>176</sup> U.S. Patent No. 4,378,116 (issued Mar. 29, 1983) ("The key feature according to the invention" is the "mode of interconnection and central fixture . . .").

<sup>177</sup> *Magliocca*, *supra* note 30, at 1018 ("[P]erhaps judges spend so much time crafting a formula to resolve . . . disputes that they can become mesmerized by the formula itself and fail to see the pragmatic consequences of their actions.").

the protected product.<sup>178</sup> The doctrine of equivalents will be a useful peg for courts to hang such a decision from.

### III. PROPOSAL

Parts III.A–C discuss copyright, trademark, and patent virtual reality licenses (“VRLs”) respectively. Part D outlines a two-step plan for Congress and the courts to implement the proposal. Congress and the courts will easily adopt VRLs in general because the VRLs do not depart from theories behind licenses for such other intellectual property as movies<sup>179</sup> and software.<sup>180</sup>

#### A. Copyright VRL

If the virtual reality representation of a physical object is indeed classified as a derivative work, then a license is already the right of the original copyright holder.<sup>181</sup> If not so classified, a new type of license should be proposed: the copyright VRL.

A copyright VRL would allow a copyright holder not necessarily versed in virtual reality programming<sup>182</sup> to outsource such labor to the benefit of the virtual reality community as well as himself. Without the VRL, if the copyright holder chooses to exercise his rights, the product would be banned from the virtual reality environment as an infringement.<sup>183</sup> Furthermore, the adoption of virtual reality technology, and hence the livelihood of the virtual reality community, will be dependent on consumers’ familiarity with the products inside the environment. Because we have assumed for this section that the Virtual Cube is not a derivative work and therefore Ms. Dunym is not an infringer, Mr. Rubik gains the security of knowing he can control the Virtual Cube via his licensing power.<sup>184</sup> Furthermore, since he will bargain during the license-granting negotiations, Mr. Rubik can set reasonable terms in regard to compensation and creative control.<sup>185</sup>

This VRL eclipses the other VRLs because it encompasses the entire basis of the work: the expression (instead of merely a tangential interest such as the consumer

<sup>178</sup> See generally *Multiform Desiccants, Inc. v. Medzam Ltd.*, 133 F.3d 1473, 1480 (Fed. Cir. 1998) (noting that “[i]nterchangeability is a significant factor in determination of equivalency.”).

<sup>179</sup> See, e.g., *Kingsley Int’l. Pictures Corp. v. Regents of Univ. of N.Y.*, 360 U.S. 684, 690 (1959) (reversing the denial of a movie license on constitutional grounds).

<sup>180</sup> *Dun & Bradstreet Software Servs. v. Grace Consulting, Inc.*, 307 F.3d 197, 202 (3d Cir. 2002) (analyzing a software licensing agreement to determine breach).

<sup>181</sup> See 17 U.S.C. § 106 (2000) (Since the ability to produce a derivative work is an exclusive right of the copyright holder, and a derivative work is something that the holder would develop or license another to develop, the licensing of a derivative work must also be an exclusive right of the copyright holder.).

<sup>182</sup> See *supra* Part II.A (Mr. Rubik in this case).

<sup>183</sup> *A&M Records v. Napster, Inc.*, 239 F.3d 1004, 1014 (9th Cir. 2001) (infringing the right to distribute and reproduce).

<sup>184</sup> See generally *Dun & Bradstreet Software Servs. v. Grace Consulting, Inc.*, 307 F.3d 197, 202 (3d Cir. 2002) (analyzing a software licensing agreement to determine breach).

<sup>185</sup> See generally *Kingsley Int’l. Pictures Corp. v. Regents of Univ. of N.Y.*, 360 U.S. 684, 690 (1959) (parties bargained for license).

confusion or the result of the work). It eclipses a trademark VRL because consumer confusion is not a foregone conclusion: a virtual reality environment might not be an area for commerce, unlike the internet.<sup>186</sup> If the virtual reality environment is not an area for commerce, the concern for preserving trademark interests will diminish. It eclipses a patent VRL because a patent usually involves a series of interactions to obtain a desired result based on the operation of physical laws.<sup>187</sup> These interactions and laws are not inevitable in a virtual reality environment because a programmer may change them. Therefore, concern for preserving patent interests will be the lowest of all three.

Thus, in the hypothetical scenario,<sup>188</sup> Mr. Rubik would possess the ability to issue a copyright VRL to Ms. Dunym to develop a virtual reality representation of the Original Cube at whatever terms the parties agree upon to the benefit of Mr. Rubik, Ms. Dunym, and consumers.

### *B. Trademark VRL*

A trademark VRL in conjunction with a copyright VRL provides a powerful method to control IP rights. If Mr. Rubik held a copyright VRL alone, Ms. Dunym could affix the trademark "Rubik's Cube" to her Virtual Cube only if it truly is a different expression than the Original Cube.<sup>189</sup> If Mr. Rubik held a trademark VRL alone, Ms. Dunym could create the Virtual Cube as a true imitation of the Original Cube and market it as "Sue's Cube."<sup>190</sup> However, if Mr. Rubik wielded both a copyright and a trademark VRL, Ms. Dunym could do neither of these things.

Furthermore, a trademark VRL holder could also take advantage of virtual reality advertising similar to the in-game advertising of today.<sup>191</sup> However, when a virtual reality environment becomes a tool for commerce as the internet has,<sup>192</sup> the VRL will be mandatory if not obviated.<sup>193</sup> Thus, instead of allowing Mr. Rubik the right to a trademark VRL, Congress and the courts may simply extend trademark protection to the virtual reality environment and achieve the same result.

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<sup>186</sup> See generally *Peapod Online Grocery Shopping and Delivery Service*, at <http://www.peapod.com> (last visited Oct. 27, 2004) (shopping for groceries online); *errorwear: embrace your computer problems*, at <http://www.errorwear.com> (last visited Oct. 27, 2004) (shopping for apparel).

<sup>187</sup> See, e.g., *Diamond v. Chakrabarty*, 447 U.S. 303, 305 (1980). Chakrabarty's process for producing oil-eating microorganisms, could result in anything in a virtual reality environment.

<sup>188</sup> See *supra* Part II.A (detailing the hypothetical scenario).

<sup>189</sup> See generally *King Features Syndicate v. Fleischer*, 299 F. 533, 535 (2d Cir. 1924) (only the copyrightable elements should be considered).

<sup>190</sup> See generally 15 U.S.C. § 1127 (2000) (noting that trademark protection is for marks or service names associated with a good rather than the expression of the idea which falls under copyright protection).

<sup>191</sup> See *supra* note 160.

<sup>192</sup> See generally *Peapod Online Grocery Shopping and Delivery Service*, at <http://www.peapod.com> (last visited Oct. 27, 2004) (shopping for groceries online); *errorwear: embrace your computer problems*, at <http://www.errorwear.com> (last visited Oct. 27, 2004) (shopping for apparel).

<sup>193</sup> See generally 15 U.S.C. § 1127 (2000). Trademark protection will be enforced in a virtual reality environment for the same theories that apply in a regular environment if the virtual reality environment is used for commerce.

### C. Patent VRL

Because the virtual reality environment is not subject to the same physical laws as a regular environment,<sup>194</sup> and a patent's innovation usually lies in skirting these physical laws,<sup>195</sup> it is difficult to ponder the use of a patent VRL. For example, a process patent will not protect a process in a virtual reality environment, especially if an unknown result occurs.<sup>196</sup> Indeed, the result manifests the whim of the programmer; the virtual result does not necessarily track the result of the same process in a regular environment. The same holds true for a utility patent,<sup>197</sup> and arguably for a design patent as well.<sup>198</sup>

There is no need to protect what is not there. Thus, in the hypothetical scenario, there is no need to issue a patent VRL when Ms. Dunym has not reproduced the inner mechanisms of the Original Cube, arguably the prime subject of the patent,<sup>199</sup> and there is no equivalent.<sup>200</sup> Indeed, she may not have any knowledge of the inner workings at all.<sup>201</sup> If so, a patent VRL will accomplish nothing more than a copyright VRL. Therefore, although a court will find patent infringement,<sup>202</sup> the issuance of a patent VRL is inappropriate in this situation.

In sum, while a copyright VRL will be useful, especially in tandem with a trademark VRL, a trademark VRL alone is redundant, and a patent VRL alone does not further the policies behind the issuances of patents themselves.

### D. Implementation Plan

Congress and the courts should encourage development of virtual reality technology while simultaneously protecting the interests of current IP holders by following a two step plan.

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<sup>194</sup> See *supra* Part II.A (Ms. Dunym has no need for the internal springs and joints of the Original Cube when she can program the mechanics of the Virtual Cube directly.).

<sup>195</sup> See, e.g., U.S. Patent No. 4,772,020 (issued Sept. 20, 1988) (A "NERF" football stabilizes the normally erratic flight pattern resultant when a small hand throws a regular football.). In a virtual reality environment all spirals could be perfect regardless of this invention.

<sup>196</sup> See, e.g., *Diamond v. Chakrabarty*, 447 U.S. 303, 305 (1980). Chakrabarty's process for producing oil-eating microorganisms, could result in anything a virtual reality programmer wishes, destroying the applicability of protection.

<sup>197</sup> See e.g., U.S. Patent No. 4,589,569 (issued May 20, 1986) (The drinking lids popularized by the Starbucks Coffee Company are designed so that when stacked downward pressure is diverted from the top of the lid, preventing any of the lids from sticking together when transported.). This phenomenon will not appear in the virtual reality representation of the lids if the programmer forgets to code it.

<sup>198</sup> See, e.g., U.S. Patent No. 4,378,116 (issued Mar. 29, 1983). The design of an object such as the Rubik's Cube is also subject to physical laws, hence the care with which the inside was created.

<sup>199</sup> See U.S. Patent No. 4,378,116, *supra* note 165.

<sup>200</sup> See *supra* Part II.A. The very need for an equivalent has vanished.

<sup>201</sup> See *supra* Part II.A. Ms. Dunym is only familiar with the superficial manipulation of a user rather than any knowledge of one skilled in the art.

<sup>202</sup> See *generally* *Multiform Desiccants, Inc. v. Medzam Ltd.*, 133 F.3d 1473, 1480 (Fed. Cir. 1998) (noting that "[i]nterchangeability is a significant factor in determination of equivalency.").

First, before a virtual reality environment approaches perfect replication of the senses, thus creating significant harm to existing products,<sup>203</sup> Congress and the courts should not find infringement in cases where virtual reality programmers tests their ability at realism. They should find a fair use instead, because if consumers find things they readily recognize in a virtual reality world, the chances of societal adoption of that world increase. This societal adoption of virtual reality technology will be paramount to the livelihood of the virtual reality community and viability of virtual reality as an industry, hence a fair use characterization is not only appropriate but could be vital.

Second, after significant harm to products is shown due to identical products appearing in a virtual reality environment,<sup>204</sup> Congress and the courts should protect the licenses (VRLs) that the IP holders created, thus fostering the growth of the VRSPs who will employ the same people whose imaginations were captured in step one.<sup>205</sup> The VRSPs will benefit because their programming experience, which Congress encouraged in step one, makes them the ultimate choice of licensees of the VRLs, which Congress encourages in the instant step.

#### IV. CONCLUSION

The virtual reality representation of a physical object that has a valid copyright, trademark, and patent will be an infringement of those IP interests because (1) it will significantly harm the demand for the physical object, (2) it is a reproduction of the work, (3) it is a derivative work, (4) it is a distribution of that work, and (5) it coincides with the trend to increase protection of IP interests.

Furthermore, a copyright VRL and a trademark VRL are appropriate responses in the hypothetical scenario developed where the physical object is a puzzle that enhances the mind rather than something that results in a quantifiable change of the physical environment. A trademark VRL alone is redundant, especially where a virtual reality environment is used as a place for commerce. Also, a patent VRL alone does not further the policies behind the issuance of the patent itself when applied to a virtual reality environment.

Finally, in order to promote the progress of science, Congress and the courts should begin by finding virtual reality representations of protected property a fair use. Later, when virtual reality gets close enough to perfect replication of the senses causing commerce to suffer, Congress and the courts should use the newly implemented VRLs to protect those interests and promote the growth of VRSPs. The VRSPs will find a ready and talented pool of programmers that Congress and the courts themselves allowed to mature in the first step.

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<sup>203</sup> See generally *Campbell v. Acuff-Rose Music*, 510 U.S. 569, 590 (1994); *Harper & Row, Publishers, Inc. v. Nation Enters.*, 471 U.S. 539, 568 (1985); *Sega Enters. v. Accolade, Inc.*, No. 92-15655, 1993 U.S. App. LEXIS 78, at \*36 (9th Cir. Jan. 6, 1993) (noting appropriation outweighs other considerations). Those with IP will claim the “waiting period” is arbitrary, and by the time significant harm is sufficiently proven it will be too late to save their businesses or interests.

<sup>204</sup> *Id.*

<sup>205</sup> See *supra* Part II.A (Ms. Dunym works at a VRSP). Protecting what was once free might cause some backlash in the virtual reality community, but will be necessary to encourage the community in its infancy and ultimately protect the sound policies behind IP law.

And what becomes of the programmer, our own Ms. Dunym? She will have graduated from realism, and will begin to create worlds unencumbered by that which surrounds her.