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INTELLECTUAL PROPERTY

The author investigates intellectual property and other legal theories that may have an impact on rights in 3D printing technology.

Casting 3D Printing's Coming IP Litigation: Usual Suspects and Dark Horses

By Bryan J. Vogel

Three-dimensional or 3D printing has begun to cross the chasm to mainstream use. As with previous disruptive innovations—think personal computing and mobile phones—legal challenges based in intellectual property law are sure to follow.

Anticipating where those conflicts are most likely to occur requires an understanding of the emerging technology and how its use potentially impacts various rights holders. While intellectual property law's traditional battle fronts like patent and copyright infringement will surely see heavy action, other, less obvious legal theories may also end up in the mix.

Whatever strategies get used, significant intellectual property litigation involving 3D printing seems inevitable and the outcomes of that litigation will shape—and limit—how the technology advances and who gets access to the capital it generates.

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3D Printing Now

3D printing—also known as additive manufacturing—uses CAD/CAM digital blueprint files or scans to create or copy objects that would otherwise often be impossible to build. 3D printers work like inkjet printers. But, instead of a single layer of ink, the technology deposits the desired material in successive layers to create a physical object. 3D printing uses materials ranging from polymers, plastic, resin, titanium, gold and silver, human cells and even nano-particles. Existing printers can build an already mind-boggling array of objects that includes Star Wars figurines, replacement parts for airplanes, various custom implantable and sometimes bio-absorbable medical devices and microbatteries the size of a grain of sand. One manufacturer offers a home 3D printer that replicates most of its own parts, and 4D printing—where self-assembly is the next dimension—is also on the horizon.

Industries like manufacturing, aviation and the life sciences have made increasing use of 3D printing since the technology was first introduced in the late 1980's. The recent advances of the technology come from a variety of factors. These include maturation and expiration of some of the patents originating the technology, exponential development on those inventions and wider availability of key 3D manufacturing components like the lasers used in stereolithography, one 3D manufacturing process.

Innovations continue and in the last decade the Patent and Trademark Office has received more than 6,800 applications related to 3D printing.

3D Printing and Traditional Intellectual Property Litigation

Patent Law

Patents protect new, useful, non-obvious inventions from copying (infringement)—but only after an application for the patent has been filed and then granted by the PTO.[1] The good news is that, once patented, every unauthorized use of an invention constitutes infringement even if the infringement is unintentional.[2] The bad news is that patent infringement litigation can be very expensive as inventors and alleged infringers battle over each requisite element of patentability, and the patent holder bears the burden of proving appropriate equitable relief and/or the monetary damages suffered.[3]

These hurdles mean that, to date, patent infringement litigation in 3D printing has been mostly limited to contests between printer manufacturers. For example, 3D Systems—founded by the inventor of the stereolithography method of 3D printing—engaged in a seven-year infringement battle with competitor EnvisionTec.[4] 3D Systems also brought a more recent patent infringement suit against Formlabs, a start-up manufacturer of consumer 3D printers, after Formlabs raised $3 million dollars on Kickstarter, a crowd-source funding platform.[5] Interestingly, in an untested legal theory, 3D Systems also named Kickstarter as a defendant in the infringement litigation. The proliferation of 3D printing patent filings are sure to inspire additional rights contests between and against those who manufacture 3D printing machinery and its related enabling software—especially as the technology shifts from its primary industrial use and transforms to more mass consumer availability.

But patent infringement litigation for an object or objects made on a 3D printer has yet to occur. Commentators seem to agree that litigation will occur when the copying reaches a commercial scale.[6] Whenever it occurs, that litigation is sure to prove difficult.

First, like any other patent litigation, the patent holder with rights in the copied object will have to go through the potentially costly and time consuming effort now required to prove infringement of any asserted patent. In addition, entities using 3D printers to make the objects may take advantage of various doctrines that allow reproduction of some elements of even patent-protected objects. For example, an owner of a patented object may have the right to preserve the useful life of that object and may be able to produce a wide range of replacement parts for the patented objects, even if the replacement activity is done on a commercial scale.[7] Similarly, when a patented object consists of both patented and non-patented elements, reproduction of the non-patented elements of the invention is typically freely allowed.[8]

These and other obstacles may make the manufacturers of the printers or providers of the CAD/CAM files used to create objects ideal targets for patent litigation, especially when infringement occurs in the consumer market under indirect infringement theories. However, the level of actual knowledge required to hold an entity responsible under the indirect infringement doctrines of induced and contributory infringement may potentially present a high hurdle. For example, in *Global-Tech v. SEB*,[9] the Supreme Court held that indirect infringement requires knowledge of the patent-in-suit and the direct infringement of that patent. Adding on that opinion, a divided panel of the U.S. Court of Appeals for the Federal Circuit in *Commil v. Cisco*[10] held that a good-faith belief of invalidity is evidence that may negate the specific intent required for induced infringement.

Given the multiple articles that 3D printers can produce and the countless possible users, establishing actual knowledge of a specific, infringed patent may be difficult. As a result, though consumer use of 3D printers may create multiple instances of patent infringement, policing and protecting patent rights in inventions copied on 3D printers may present significant challenges for patent holders.

Trade Secret

Trade secret law offers protection to a formula, practice, process, design, instrument, pattern or compilation of information as long as the subject of the secret is not generally known in the industry, appropriate efforts have been made to keep it secret and the secret confers

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[1] *See* 35 U.S.C. §§ 101-103, 112.

[2] *See* 35 U.S.C. § 271.

[3] *See, e.g., Transclean Corp. v. Bridgewood Servs., Inc.*, 290 F.3d 1364, 1370, 62 U.S.P.Q.2d 1865 (Fed. Cir. 2002) (64 PTCJ 103, 5/31/02); *Vulcan Eng'g Co. v. Fata Aluminum, Inc.*, 278 F.3d 1366, 1376, 61 U.S.P.Q.2d 1545 (Fed. Cir. 2002) (63 PTCJ 333, 2/15/02).

[4] *See 3D Sys., Inc. v. EnvisionTec, Inc.*, No. 2:05-cv-74891-AC-RSW, 2011 BL 62098 (E.D. Mich.). The case ended in a settlement shortly after the district court entered a ruling that EnvisionTec had infringed 3D System's patents.

[5] *See 3D Sys., Inc. v. Formlabs & Kickstarter*, No. 0:12-cv-03323-MBS (D.S.C.). As of the writing of this article, the case has been stayed until September 2013 pending court-ordered settlement discussions between the parties.

[6] *See, e.g.,* Michael Weinberg, ''It Will Be Awesome If They Don't Screw It Up: 3d Printing, Intellectual Property, and the Fight Over the Next Great Disruptive Technology,'' Public Knowledge, *available at http://publicknowledge.org/it-will-be-awesome-if-they-dont-screw-it-up;* Davis Doherty, ''Downloading Infringement: Patent Law as a Roadblock to the 3d Printing Revolution,'' 26, Harv. J.L. & Tech. (Fall 2012). The article outlines possible patent infringement scenarios—and culpable infringers—arising from consumer use of 3D printers. To address the many difficulties of patent infringement enforcement in the consumer market, the article author proposes creating a solution similar to the Digital Millenium Copyright Act, 17 U.S.C. § 512 (discussed infra) for use in 3D printing. *See id.* at 365.

[7] *See Dana Corp. v. Am. Precision Co.*, 827 F.2d 755, 759, 3 U.S.P.Q.2d 1852 (Fed. Cir. 1987). A complete reconstruction of the object is, however, likely prohibited. *See, e.g., Sandvik Aktiebolag v. E.J. Co.*, 121 F.3d 669, 43 U.S.P.Q.2d 1620 (Fed. Cir. 1997).

[8] *See Aro Mfg. Co. v. Convertible Top Co.*, 365 U.S. 336, 128 U.S.P.Q. 354 (1961).

[9] *Global-Tech Appliances Inc. v. SEB S.A.*, 131 S. Ct. 2060, 2067-68, 2011 BL 142067, 98 U.S.P.Q.2d 1665 (2011) (82 PTCJ 137, 6/3/11).

[10] *Commil USA, LLC v. Cisco Sys., Inc.*,720 F.3d 1361, 2013 BL 167369, 107 U.S.P.Q.2d 1290 (Fed. Cir. 2013) (86 PTCJ 457, 6/28/13).

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a competitive advantage.[11] All 50 states offer some form of trade secret protection with 47 using some version of the Uniform Trade Secrets Act and the rest offering a similar, common law protection. While specific definitions and requirements vary, all have the same basic requirements as a prerequisite to protection.[12]

Unlike patent law, trade secret law carries with it no requirement of usefulness, novelty or nonobviousness. As patent litigation has become more expensive and proof of infringement has become more difficult, trade secret claims have become an increasingly popular avenue through which to attempt protection of important intellectual property rights.

Courts look to a variety of factors to determine whether the claimed information is in fact a trade secret, including the extent to which the information is known outside the business, the measures taken to guard its secrecy and the ease or difficulty with which the information could be acquired by others.[13] Once established, proving misappropriation requires a showing that someone other than the trade secret owner knowingly acquired the secret directly or indirectly through improper means or through breach of a duty to keep it secret.[14]

3D printing will likely see its fair share of misappropriation of trade secret claims, especially as individual users leverage proprietary adaptations, modifications and processes in an effort to scale their use to a commercial scale. The success of those claims will depend on the efforts made to keep the claimed advantage secret and the application of the particular jurisdiction's laws and precedent to the unique circumstances of the case at hand.

Trade Dress and Design Patent

Like trademark,[15] trade dress offers protection to consumers regarding the origin of the product they have purchased.[16] Trade dress refers to the overall appearance and image of a product. In order to be protected, trade dress must either be inherently distinctive or have developed a secondary meaning that serves to help consumers identify the source of the product. While product packaging can be inherently distinctive—like the shape of a Coke bottle—product design can only receive trade dress protection when it has developed the requisite secondary meaning.[17]

Design patents also offer protection to a product's design features. Rather than consumer association, however, design patent protection comes from the exact description of the design or ornamental invention illustrated within the design patent.[18]

Trade dress protection and design patent protection are not mutually exclusive, and a design element may have both protections at the same time or one right after another. Design patents played an important role in the epic smartphone battle between Apple and Samsung with Apple's design patent serving as the basis of the preliminary injunction first issued in the case.[19]

Though trade dress protections are unlikely to play a large role in 3D printing rights-related litigation, design patents might. By focusing patenting efforts on both innovative ornamental features, as well as the utility of the overall system and individual parts, rights holders can extend their proprietary reach. Once again, however, policing the additional rights design patents offer may be an ongoing challenge.

Copyright

Unlike patents, copyright attaches automatically to a creative work upon fixation or physical embodiment.[20] Copyright protection usually covers things like writings, drawings, musical compilations, sculptures and other original designs. It does not, however, extend to the function of a copyrighted work or the idea that a copyrighted work expresses. And, though registration of copyright provides multiple benefits, registration is not a prerequisite to copyright protection.

Some parts of the copyright/3D printing equation are easy. Copyright protection clearly applies to objects copied using 3D printers that are purely design-oriented. For example, someone who scans an artist's sculpture and then prints a copy of it would likely infringe the artist's copyright—and the scan constitutes a copy as does the 3D printed object. Similarly, CAD design files that direct 3D printers to make unique sculptures and other artistic objects should enjoy copyright protection—as should the objects themselves as derivative works.

Companies that make and sell copyrightable objects like toy figurines and decorative home designs may also have enforceable copyrights that make the exact replication of their copyrighted creations copyright infringement. Here, the deterrents of the Copyright Act, which allows award of statutory damages of up to $150,000 per work for willful infringement, may have some teeth.[21]

Other parts of copyright protection present harder questions. Some functional items that are ineligible for copyright protection—like a coffee cup—may also include design items that have copyright protection. Copyright law uses a ''separability test'' to determine whether or not copyright protection may be available for some aspect of an item. Separability has no definitive test and can be expensive to prove and litigate.[22] Additionally, it's not clear what copyrights exist, if any, for a file created in CAD (rather than scanned) when the design covers a useful object not eligible for copyright protection and whether unauthorized use of the file to create an object on a 3D printer constitutes copyright infringement.

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[11] *See* Restatement of Torts § 757; Uniform Trade Secrets Act, § 1(4).

[12] *See id*.

[13] *See* Restatement of Torts § 757, comment b.

[14] *See e.g., Medspring Grp., Inc. v. Feng*, 368 F. Supp. 2d 1270, 1276 (D. Utah 2005).

[15] While 3D replication of an item including a trademark has the potential to violate trademark law, creating the item without the mark would be unlikely to qualify as a trademark violation, especially if the item is only made for home use.

[16] *See* 15 U.S.C. § 1125(a).

[17] *See Wal-Mart Stores, Inc. v. Samara Bros., Inc.*, 529 U.S. 205, 54 U.S.P.Q.2d 1065 (2000) (59 PTCJ 676, 3/24/00).

[18] *See* 35 U.S.C. § 171.

[19] *See Apple, Inc. v. Samsung Elecs. Co*., No. 11-CV-01846 (N.D. Cal.).

[20] *See* 17 U.S.C. § 102.

[21] *See* 17 U.S.C. § 504. Consideration should be given to the public-relations issues that accompanied the Recording Industry Association of America's litigation efforts against individual consumers for illegal music downloading before that strategy is used.

[22] *See Chosun Int'l v. Chrisha Creations*, 413 F.3d 324, 75 U.S.P.Q.2d 1309 (2d Cir. 2005) (70 PTCJ 326, 7/15/05).

For now, allegations of copyright infringement have been largely restricted to the confines of the Digital Millenium Copyright Act. Early examples include HBO's takedown notice to a site offering to sell a 3D-printed, smartphone charging dock shaped like the Iron Throne from HBO's ''Game of Thrones'' TV series and Games Workshop (''GW'') to free 3D printing file-sharing website Thingsverse after it found designs for figurines based on those included in GW's Warhammer game.[23]

Under the DMCA, a website that hosts content acts as an impartial messenger between those who upload material to that site and those who potentially hold a copyright in that material. When the copyright holder sees content on the website it believes to be infringing, it can send a DMCA takedown notice to the site objecting to the use and requesting that the file be taken down. Upon receiving this notification, the website typically takes down the content and notifies whoever uploaded the content of the claimed infringement. Following this procedure then gives the website host safe harbor from infringement claims. The entity accused of infringement can either accept the takedown or notify the site that there is no infringement and repost the content. The copyright holder then either accepts the reposting or sues for copyright infringement.[24]

Both the HBO and GW takedown notices went unchallenged by the individuals posting the allegedly objectionable content. Like enforcement efforts related to patents, however, using the DMCA to protect 3D printing infringement of copyrights will likely require an increasingly daunting effort to police all potential sources of infringement.

Dark Horses

In addition to the traditional intellectual property litigation bandwidth 3D printing is sure to consume, some other less conventional theories may end up impacting rights related to the technology.

Antitrust Laws

The intersection of antitrust and intellectual property laws may serve to limit some future 3D printing rights. Occasionally, a party charged with infringement will challenge the patent's validity on antitrust grounds. Turning the defense of a patent infringement action into a successful offensive antitrust claim is difficult, but not impossible. If effective, those claims may serve to limit the power of some 3D printing patent holders.

Alleged infringers can challenge claimed patent rights by arguing that the patent infringement action constitutes sham litigation. Sham litigation claims must clear several procedural and proof hurdles before they can provide a viable defense against a claim of patent infringement.[25]

Alleged infringers—including direct purchasers—may also bring a so-called *Walker Process* claim, which removes the usual immunity from Sherman Act Section 2granted by the patent laws, if the patent holder has attempted to enforce a patent procured by knowing and willful fraud upon the PTO.[26]

In limited circumstances, alleged infringers can also turn to the antitrust laws to support allegations of patent misuse without establishing a full antitrust cause of action. Typical misuse claims involve tying—conditioning the purchase of a patented product on the purchase of another accompanying product—or attempting to illegally extend the time of the patent grant.[27]

The 3D printing world has seen its first allegations of patent misuse and anticompetitive tying. In *DSM Desotech v. 3D Systems*,[28] 3D printing resin manufacturer DSM Desotech accused 3D Systems of anti-competitive conduct in the highly concentrated resin market. DSM Desotech claimed 3D Systems inclusion of a radio frequency identification feature in one of its popular printers that required use of 3D Systems resins with that printer constituted an illegal tying that had an anticompetitive effect on smaller competitors.

The district court rejected those claims, in part, because DSM Desotech failed to establish that a distinct market for 3D printers and resins—a decision DSM Desotech has on appeal to the Federal Circuit. As a distinct market for 3D printing continues to emerge, more antitrust allegations will likely follow—and potentially impact the reach of rights of intellectual property holders in that marketplace.

FDA Limitations

Finally, current bio-medical uses of 3D printed devices may begin to challenge traditional medical device approvals. Section 561 of Federal Food, Drug, and Cosmetic Act recognizes that there may be circumstances under which a health care provider may wish to use an unapproved device to save the life of a patient. FDA regulations provide guidelines for when that kind of use will be allowed and, in February of 2012, physicians at the University of Michigan obtained an emergency approval to create a bioresorbable airway stent out of a

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[23] After another designer also figured out a print plan to make the object, a designer who hoped to sell plans to print an object based on the Penrose Triangle—a famous optical illusion—retracted a takedown notice sent to Thingsverse following significant public pressure.

[24] *See* 17 USC § 512.

[25] In addition to overcoming the *Noerr-Pennington* doctrine, which immunizes a party from antitrust liability for petitioning the government even if the party seeks to advance anticompetitive laws, an antitrust challenge to a patent must also prove that the patent owner has attempted to enforce a patent it knows to be invalid and that all necessary elements of the claimed antitrust violation exist. *See, e.g., Handgards, Inc. v. Ethicon, Inc.*, 601 F.2d 986, 994-96, 202 U.S.P.Q. 342 (1979).

[26] *Walker Process* claims require that all elements of the alleged antitrust violation also be established as well as all elements of common law fraud. *See, e.g., Kaiser Found. Health Plan, Inc. v. Abbott Labs., Inc.*, 552 F.3d 1033, 2009 BL 6555 (9th Cir. 2009); *Dippin' Dots, Inc. v. Mosey*, 476 F.3d 1337, 1346, 81 U.S.P.Q.2d 1633 (Fed. Cir. 2007) (73 PTCJ 433, 2/16/07).

[27] *See, e.g., Princo Corp. v. Int'l Trade Comm'n*, 616 F.3d 1318, 1334, 2010 BL 201288, 96 U.S.P.Q.2d 1233 (Fed. Cir. 2010) (en banc) (80 PTCJ 600, 9/3/10), cert denied, 131 S. Ct. 2480 (U.S. 2011), which restricts the instances when patent misuse can serve as a defense to patent infringement to instances where there is a direct connection between the patent-in-suit and the alleged misconduct, even if the claimed misconduct has a clear anticompetitive effect.

[28] *DSM Desotech Inc. v. 3D Sys. Corp.*, No. 1:08-cv-01531(N.D. Ill.).

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biopolymer for a baby suffering from a life-threatening congenital condition.[29]

As bio-medical 3D printing advances continue, will the FDA reach a limit in how many emergency uses it will authorize? And will traditional medical device manufacturers seek to use an emergency situation to change the cycle time traditionally associated with implantable medical device approvals? Only time will tell on these complex issues.

Conclusion

The early promises of 3D printing have begun to emerge. Along with lifesaving discovery and exponential individual and collective creativity, intellectual property—and other—litigation will serve to define just what impact 3D technology has in the decades to come.

[29] *See http://www.uofmhealth.org/news/archive/201305/baby%E2%80%99s-life-saved-groundbreaking-3d-printed-device*.