

Copyright Issues in 3D Printing

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This paper was first presented at the **International Technology Law Conference in Paris, France, October 2014.*

Biography

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Ira M. Schwartz is a partner in Parker Schwartz, PLLC located in Phoenix, Arizona. He practices primarily in the intellectual property area, representing a broad range of clients from large corporations and universities, to small and medium sized high tech businesses, to individual artists, authors and inventors. His practice includes prosecuting copyright and trademark applications, both in the U.S. and internationally, preparing licensing and royalty agreements, manufacturing and distribution agreements, and enforcing and defending patent, trademark, copyright infringement and trade secret misappropriation cases in federal and state courts. Mr. Schwartz lectures frequently on the topics of computer law and internet law, Intellectual Property Law and International Arbitration of Intellectual Property Disputes. He is a member of the Board of the International Technology Law Association (ITechLaw) and a past president of the Intellectual Property Section of the State Bar of Arizona. Mr. Schwartz is also a *Judge Pro Tempore* of the Arizona Superior Court. In addition to his active intellectual property litigation practice, he regularly serves as a mediator and an arbitrator.

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I. The Penrose Triangle Take-Down Notice

A “Penrose Triangle” is an “impossible object” which was the subject of the first reported copyright dispute related to 3D Printing. To be precise the object was a variation on a Penrose Triangle design created by Oscar Reutersvard. Reutersvard developed an optical illusion that looked like this:



Reutersvard created this illusion in the 1930's. In 2011, a design file was posted on Thingiverse, an online site that allows users to post their designs for 3D printed objects. In February 2011, Ulrich Schwanitz sent a copyright takedown notice to Thingiverse claiming to be the owner of the copyright in the 3D printed version of this object and claiming the design files infringed his copyright. So began the first widely reported claim of copyright infringement related to 3D printed objects.¹

¹ There are several reported concerns about the propriety of this take-down notice. See Electronic Frontier Foundation Take Down Hall of

II. How Does 3D Printing Work?

A. Printing

Traditionally products or parts for products are manufactured by taking large pieces of raw materials and using various machines such as saws, lathes and other cutting devices to remove the unwanted material until you arrive at the shape of the part you want. The manufactured parts are then assembled into the desired object.

In contrast, 3D printing, also referred to as additive manufacturing, creates a part by starting with a three dimensional drawing for the part. A specially designed printer then uses a tiny filament to lay down a series of narrow layers of material, building the desired part up one layer of material at a time until the desired part is achieved. Essentially the part is built from the ground up one thin layer of material at a time. The materials are designed so that each part of the filament fuses to the portion already deposited next to and on top of it thereby forming a solid whole piece. 3D printers come in various shapes and sizes and have the

Shame at <https://www.eff.org/takedowns/ulrich-schwanitz-penrose-triangle-3d-design-takedown>. Among the concerns noted was how Schwanitz could claim copyright protection in a work created by Reutersvald. While it was reported that Thingiverse initially removed the design from its site, the design and variations of it are currently available on Thingiverse and elsewhere.

ability to use a variety of materials from simple plastic materials to titanium aircraft parts².

The revolution in additive manufacturing is occurring as the price of the 3D printers is falling. Currently, low cost models can currently be acquired for less than US \$1,500.00. The cost of materials can also be very low³. This enables people to conceive of products and produce them in a wide variety of shapes and forms in a matter of minutes or hours at low cost.

B. Scanning

Simultaneously with the development of low cost printers, low cost 3D scanners have also developed. While there are variations on how some scanners work, in a common variation, a small object is placed inside a tabletop scanner. The scanner is set up so that it uses a laser to measure the dimensions of the object in one plane. Then either the object is rotated inside the scanner or the laser scanner rotates around the object and successive images are taken. A computer program then merges the multiple images

² Airbus Adds Metal 3-D-Printed Parts to New Jets, George Putic, Voice of America , July 24, 2014 <http://www.voanews.com/content/airbus-adds-metal-three-d-printed-parts-to-new-jets/1964601.html>. With different types of materials, the fusing process may be different.

³ The price of a Makerbot Replicator Mini is listed at \$1,375 as of August 25, 2014. 3D scanners are available for less than US\$1,000. See <<http://store.makerbot.com/replicator-mini>>.

so that a precise three dimensional image of the object is captured digitally.

There is some question whether copyright protection may be available for the 3D scanned images. Generally for copyright protection to apply there must be some creativity or originality in the work created. While there can be copyright protection in the selection, arrangement and layout of an image, assuming there is some originality in the process, there arguable would not be any copyright protection if the process is purely mechanical.⁴ An analogy can be made to photographs. Generally copyright protection is available for photographs, but the creativity protected in a photograph is in the selection and coordination of the subject matter, including the background, the lighting and composition of the image, and the layout of the photograph. However, if there is no creativity in the process, then arguably there would be no copyright protection.

In keeping with the analogy, there may be some copyright protection in a 3D scanned image if the operator of the scanner selects the lighting components, the position of

⁴ *Feist Publications, Inc. v. Rural Telephone Service Co.* 499 U.S. 340 (1991). *Computer Associates Int'l Inc. v. Altai, Inc.* 982 F.2d 693, 705 (2nd Cir. 1992) (holding that there is no copyright protection for an idea or in any materials necessarily incident to the idea. Copyright protects only creative expression. Also stated as the "merger doctrine" which says that if there is only one way to express an idea, there is no copyright protection in that expression.)

the scanners, the rate of scanning, etc.⁵ However, such copyright protection would be difficult to claim if the process is entirely automated and operator's contribution is merely to insert the object into the machine and hit the start button.

C. The Process

With the combination of three dimensional scanning, three dimensional design software, and a 3D printer, it is a simple process to scan a product and then reproduce it by printing it out. With a little knowledge and training, the scanned images can be edited or redesigned to create virtually endless reinterpretations or variations on the design.

III. What Does Copyright Protect?

Copyright law generally provides that the owner of a copyright has the exclusive right to copy or reproduce a copyright protected work⁶. This means that a person who copies a protected work without the permission of the copyright owner may be guilty of copyright infringement.⁷ As the process of scanning a product and reproducing it on a 3D printer involves copying, this raises copyright infringement concerns.

⁵ Of course, if the scanned image is of a copyright protected sculpture, to the extent there is any copyright in the scanned image, that image would necessarily be a derivative work. If the copyright protected sculpture was scanned without the authority of the copyright owner, the scanned image could arguable be an infringing work. 17 U.S.C. §501.

⁶ See 17 U.S.C. §106; See generally 17 U.S.C. §101 et seq.

⁷ 17 U.S.C. § 501, et seq.

A. The type of Activities that are Permitted?

There are at least a few types of 3D printing activities that do not raise any copyright issues.

1. Printing Where No Copying is Involved

Is it axiomatic that copyright prohibits the making of copies. Therefore if there is no copying involved, there can be no copyright infringement. In the case of 3D printing, there is at least a significant portion of additive manufacturing where no copying occurs. This happens when an original design is created. So if a 3D printer were used by someone developing a new original design for a new product that was independently developed, there would be no copying involved and therefore no copyright concerns. Of course, the person creating the new design may have copyright protection in his design, assuming that design is subject to copyright protection.

2. Copying Works Known to be in the Public Domain

Copyrights last for a limited time. Currently a copyright in work lasts for the lifetime of the author plus 70 years⁸. However, this time limit has been expanded in recent

⁸ 17 U.S.C. §302.

years and under previous versions of the U.S. Copyright Act, the copyright term was a maximum of 56 years⁹. So many older works are already in the public domain and copying those works is freely permissible. For example, if you had access to and copied a piece of sculpture that was created long enough ago that its copyright has expired, such as the Statue of Liberty, that would not create any copyright infringement liability.

3. **Works That are Not Subject to Copyright Protection**

One large category of works which are not protectable under copyright law is useful articles.¹⁰ However, in some cases, if the useful article has artistic features that can be separately identified and are capable of existing independently as a work of art, those features may be protected by copyright law.¹¹

Separating out what a useful article is from an artistic element can be difficult. A useful article is something that serves a function other than to inform, entertain or portray its appearance to humans. Courts often have a difficult time

⁹ See Copyright Act of 1909, Section 23.

¹⁰ See 17 U.S.C. § 113; See generally Compendium of U.S. Copyright Office Practices, 3rd Ed. (Draft Aug. 19, 2014), §924, available at <http://copyright.gov/comp3/docs/compendium-full.pdf>; 17 U.S.C. § 101; *Baker v. Selden*, 101 U.S. 99, 105 (1880).

¹¹ *Fabrica, Inc. v. El Dorado Corp.*, 697 F.2d 890, 893 (9th Cir. 1983).

trying to figure out if the artistic components of useful articles can be separated out.¹²

The copyright law requires that a determination be made whether an article is purely utilitarian or whether there are some separable artistic elements that may be protectable under copyright law.

4. Copying where Authorized

Of course, copying would be permitted where it is expressly or implicitly authorized. So in cases where the copyright owner has expressly granted the printer the authority to print his design there would be no copyright infringement. While lawyers always prefer express written licenses, in some situations a license will be implied, and copying, therefore, permitted.¹³

There are at least two common scenarios where a license applies. The first is where a customer with a unique design he created comes to graphic designer or prototype

¹² *Mazer v. Stein*, 347 U.S. 201, 214 (1954) (upholding the copyright registration of a statuette of a male and female dancer which was incorporated into a lamp base); *Inhale Inc. v. Starbuzz Tobacco, Inc.* 739 F.3d 446, 449 (9th Cir. 2014) (Holding that the design of water hookah could not be separated out from its utilitarian functions and therefore was not entitled to copyright protection); *Cf. Masquerade Novelty, Inc. v. Unique Industries, Inc.*, 912 F. 2d 663, 670 (3rd Cir. 1990) (Holding that nose masks in the shape of animal noses were entitled to copyright protection and were not useful articles).

¹³ See *Effects Associates, Inc. v. Cohen*, 908 F2d 555,558-559. (9th Cir. 1990; *Oddo v. Ries*, 743 7 2d 630 (9th Cir. 1984).

manufacturer and requests to have his design duplicated. As the copyright owner he can authorize such duplication and the circumstance of such an arrangement demonstrate his consent to the reproduction.

A second common scenario occurs in the online 3D print community with sites such as Thingiverse or Shapeways.¹⁴ In these online spaces people openly share the electronic design files for all kinds of objects which can be printed on 3D printers. Users who post their designs generally authorize every user of the website to copy and modify their designs and 3D print the resulting object. In most cases, the licensing is done pursuant to Creative Commons or other similar public licensing policies.¹⁵ These policies are similar in concept to shareware or open source licenses.

IV. Where Copyright Infringement May Occur

As discussed above, there are several areas where copyright infringement may lie in the 3D printing industry.

Copyright law protects sculptural works. If a three dimensional object qualifies as a sculpture, it will, in most cases, qualify for copyright protection. Making an

¹⁴ See www.thingiverse.com; www.shapeways.com; www.i.materialize.com; and www.makexyz.com.

¹⁵ See Thingiverse licensing policies at <http://www.thingiverse.com/legal>. Compare the Shapeway's policies at http://www.shapeways.com/terms_and_conditions.

unauthorized copy of a copyright protected work will often be an act of copyright infringement and may subject the infringer to substantial legal liability, including potentially injunctive relief and an award of either actual or statutory damages.¹⁶ Statutory damages for willful infringement can be as high as \$150,000 per act of infringement.¹⁷

Of course, the alleged infringer may have all the defenses discussed above, including claiming the work is purely utilitarian and not subject to copyright protection, or that the infringer had a license. In addition, any other defenses which are available in a copyright infringement action will apply, including the fair use defense.¹⁸ This may be significant in cases where only a small portion of an object is copied, such as where a component is copied for repair purposes.

V. Copyright Enforcement – Notice and Takedown Provisions

Copyright owners can always enforce their rights by filing copyright infringement actions in U.S. Federal Courts (assuming an act of infringement in the United States). However, the copyright law also gives copyright owners some further ability to help prevent online infringement of their works. In particular, the copyright laws allow the owner

¹⁶ 17 U.S.C. §§501, 503, 504.

¹⁷ 17 U.S.C. §504.

¹⁸ 17 U.S.C § 107

of a copyright in a work which is being infringed to issue a “takedown notice” to an online service provider where an infringing work, posted by a third party, appears.¹⁹ Upon receiving the notice, in accordance with the law, the ISP will usually take the infringing material off the site. The law allows the third party defendant to issue a “counter-notice” and thereby have their material reposted, unless a court issues an order otherwise.

This procedure allows copyright holders to expedite the removal of online infringing materials. This procedure provides for the removal of 3D designs that may be posted on online sites, such as Thingiverse and Shapeways, or other sites which share designs for 3D printed objects.

VI. Other Potential Legal Issues

While copyright concerns are one key issue in 3D printing, as this field develops, there will be other significant legal challenges that will need to be addressed. Among the future issues that will need to be resolved are: whether a person who creates an object using a 3D printer will be considered to be a manufacturer of the device for liability purposes, and how industry specific regulations will apply to general purpose 3D printing. As with any other evolving industry other legal issues will surely arise as the industry matures.

¹⁹ 17 U.S.C. §512.

VII. Conclusion

Those involved in the 3D printing industry will need to consider copyright issues in the items they choose to duplicate. For certain utilitarian items, copyright protection will not apply. However, where artistic elements are copied, those involved in the industry will need to make sure they are exempt from copyright or that they have the needed authorizations to duplicate those objects.

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