

Protecting IP in a 3D Printed World

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3d_printer

Three-dimensional printing technology has made impressive advances over the last several years. Thirty years ago when 3D printing was first invented, this new technology was rather expensive, difficult to use, and limited to prototyping of only small components. Today, significant developments in 3D printing technology, work flow control software, and materials science have all allowed 3D printing to be used in virtually every technology and business sector—from 3D printing of industrial products and components, to even bioprinting of human organs.

3D printing is also no longer limited to fabricating components from a single material and can today combine multiple printing materials to 3D print fully functional multi-material components, including drones and other electrical and mechanical devices. While there has been great excitement about the many advantages and benefits that 3D printing presents, commentators have pointed out that the proliferation of 3D printing technology will have significant implications to traditional business and legal frameworks, and notably to existing intellectual property (IP) laws. This article looks at some of the ways 3D printing technology fails to mesh with existing IP law and offers possible strategies to address some of these concerns.

3D Printing Technology and IP Law

3D printing is an umbrella term covering a wide range of "additive" manufacturing techniques used to fabricate or print three-dimensional products, typically done by "printing" parts or products in a layer-by-layer fashion. This printing technology is in contrast to traditional "subtractive" manufacturing techniques that removed material from a work piece in order to fabricate a product. At its core, 3D printers convert digital representations of objects (usually stored in a CAD or similar file) to actual physical objects. Consequently, the potential application for this technology is nearly unlimited.

Recent proliferation of 3D printing technology also presents at least two unique paradigm shifts in the business world. First, in the industrial sector, the traditional role of manufacturers making and stocking products to be sold later on may no longer be relevant where companies can 3D print components for consumers "on demand." Consequently, traditional supply and distribution chains will likely be unnecessary. Second, mass adoption of 3D printing by consumers will allow users to now print 3D objects in the privacy of their homes, without the need for a manufacturer. Although the first paradigm shift may have far reaching implications in disrupting the traditional manufacturer-consumer relationship, existing IP laws are generally expected to adequately address the IP issues that arise in this scenario. The second paradigm shift, however, is perhaps the real concern for how IP protection will need to adapt.

Mass adoption of 3D printing technology in the residential sector has not happened just yet. Entry barriers such as the cost of 3D printers, performance and ease of use have generally prevented 3D printers from becoming a household commodity. However, these barriers are rapidly vanishing and most market indicators appear to be pointing to a future in which sophisticated 3D printers will become a household commodity. For example, a starter 3D printer kit that retailed for over \$2000 a few years ago is now available for under \$200. CAD files for use in printing numerous products are also now widely available on the Internet. And if a CAD file is unavailable, advances in scanning technology will allow for readily creating a digital blueprint by simply scanning the product using a smartphone. Thus, anyone with a 3D printer and a smartphone may be able to "scan" (copy) and "print" a patented product in the privacy of their basement at the push of a button. Can current IP law grapple with this scenario?

To be clear, the printing of a patented article example above is protected by existing IP law. That is, if someone 3D prints a patented product in the privacy of their basement, that person may be held liable for patent infringement by the owner of the patent. The issue then becomes one of scale and enforcement. If this example were repeated multiple times in many households, would it be practical to enforce IP rights against multiple residential actors? Furthermore, the anonymity of these actions will make it increasingly difficult to detect and identify infringers. A core tenet of IP law is the expectation that while not every infringing act may be identified and stopped due to cost of enforcement against an infringer, IP laws ensure that mass and endemic patent infringements are usually prevented such as where: (i) the infringements are performed by generally large actors on a significant scale that disrupts the business of the patent owner; and (ii) evidence of infringement can be obtained because of the visible nature of these actors and their infringing acts to the patent owner. However, these predicates for successful enforcement of IP rights are notably absent in the residential 3D printing IP infringement scenario. Even if an infringing individual actor is successfully identified, the cost of pursuing enforcement against a few individual infringers may far outweigh any recovery. Consequently, commentators expect 3D printing to impact patent protection in a similar way that digital media initially impacted copyright protection. *See* Desai and Magliocca, "Patents, Meet Napster: 3D Printing and the Digitization of Things," 102 Geo. L.J. 1691 (2014).

Pursuing non-consumer actors in the 3D printing chain under indirect theories of patent infringement, i.e., contributory and induced infringement provisions of 35 U.S.C. §271(b) and (c), also appears to be inadequate. For example, a patent owner pursuing a 3D printer manufacturer or a digital file distributor under contributory or induced infringement theories faces hurdles that can be insurmountable. A 3D printer manufacturer may show substantial noninfringing use as a defense to contributory infringement because 3D printers may be capable of use in many noninfringing applications and therefore have a substantial noninfringing purpose. *See* 35 U.S.C. §271(c). Under the patent laws, a noninfringing use is "substantial" when it is "not unusual, far-fetched, illusory, impractical, occasional, aberrant, or experimental." *See, e.g., Vita-Mix Corp. v. Basic Holding*, 581 F.3d 1317, 1327 (Fed. Cir. 2009). *To prevail under induced infringement, a patent owner must face the additional hurdle of showing that the 3D printer manufacturer actively encouraged infringement, knowing that the acts they induced constituted patent infringement, and their encouraging acts resulted in direct patent infringement. See, e.g., Power Integrations v.*

[Fairchild Semiconductor Int'l, 711 F.3d 1348](#) (Fed. Cir. 2016). Again, it is unlikely that a patentee will meet these thresholds against manufacturers of 3D printers.

Digital file distributors may also escape liability for importation infringement or indirect patent infringement because digital files are presently not deemed to be "components" of products, and therefore digital file distributors are not "making," "selling" or "using" components of a patented product as required under existing patent law. *See, e.g., Microsoft Corp. v. AT&T Corp.*, 550 U.S. 437, 441 (2007). Similar to the 3D printer manufacturers, possible indirect patent infringement actions against digital file distributors are unlikely to succeed. While patent or other IP protection for digital files may provide invaluable protection in a 3D printed world, courts and lawmakers have not conclusively addressed this issue yet.

IP Strategies to Manage 3D Printing Challenges

Strategies to prepare for 3D-printing related IP issues will require a comprehensive approach for IP owners. IP owners will be served well to seek counsel regarding the specific implications of 3D printing to their IP portfolio in order to foresee and manage potential risks. It is clear that 3D printing technology will blur the distinction between tangible and intangible forms by erasing the traditional divisions between manufacturers and consumers and what constitutes components of an infringing product. Hence, strategies to manage this risk may include looking at multiple IP areas to strengthen protection. For example, a patentee holding a utility patent on a device may be able to strengthen its patent rights to cover replacement parts or components through a design patent. In addition, creative utility patent drafting by skilled counsel can help build fences around a company's IP portfolio. In the absence of clear guidance from courts and lawmakers regarding the patentability of, or infringement by, digital files, copyright IP protection of digital files may be a valuable tool to strengthen IP. Other approaches may include enforcement strategies aimed at "choke points" such as digital file distributors or 3D printer feedstock suppliers. For example, a digital rights management system may be put in place to monitor and take down distribution of unauthorized CAD files.

Conclusion

Even the above measures may be inadequate for some businesses, especially in goods sectors that may be particularly vulnerable to "basement" 3D printing of their products. At least for these businesses, and all businesses, embracing 3D printing technology and adopting this new technology into their business model may enable them to leverage their IP assets. It is also foreseeable that the impact of 3D printing in other areas such as products liability, public safety and counterfeiting may trigger policy changes that will eventually impact existing IP laws. Whatever may occur, it still remains prudent for IP owners to assess and develop suitable strategies for their IP portfolios to prepare for a 3D printing future.

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