

# THE NATIONAL LAW REVIEW

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## Patent Infringement: Promises And Pitfalls Of 3D Printing

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3D printing offers great promise for innovation and manufacturing, but this tool has expanded the scope of patented products that can be easily and cheaply copied, and may make it harder to identify and prosecute infringers. The *USPTO* held a [conference](#) on legal and policy issues surrounding 3D printing on June 28, 2016.

### Intellectual Property Surrounding 3D Printing

According to Russell Slifer, Deputy Secretary of Commerce for Intellectual Property and Director of the USPTO, patent filings relating to 3D printing have increased 23-fold over the last five years, and trademark filings for businesses involved in 3D printing have increased 300% over the same time period. While there is great interest and excitement surrounding the promise of 3D printing, there also is concern about how 3D printing could make it easy to copy a patented product with just a push of a button.

### The Basics Of 3D Printing

3D printing allows a person to produce a three-dimensional object using a wide variety of materials. 3D printing [generally involves these steps](#):

- The object design is encoded in a computer-aided design (CAD) file generated by drawing or scanning the object in three dimensions.
- The CAD file is converted into a STL file that describes the 3D surface of the object.
- 3D printing software “slices” the surface into printable layers and transfers instructions on how to print each layer to the 3D printer.
- The 3D printer prints out the object.

To date, 3D printing has been used to make toys, car parts, medical devices and even human organs. In addition to being useful for making consumer-ready products, 3D printing can be used to make prototypes during product development.

### Medical Uses Of 3D Printing

The doctors on [Grey’s Anatomy](#) have been using 3D printing for several seasons now, but 3D printing also is being used in real medical situations. As reported by Shafiee and Atala in “Printing Technologies for Medical Applications,” *Trends in Molecular Medicine* 22: 254-265 (2016), surgeons are using 3D printing to make models of human organs to practice and optimize medical operations. 3D-printed human organs also have been used for drug testing.



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In August 2015, the FDA approved the first [3D-printed drug](#), Apricia's rapidly-dissolving [SPRITAM® \(levetiracetam\)](#) product for treating epilepsy. In "A New Chapter in Pharmaceutical Manufacturing: 3D-printed Drug Products," [Advanced Drug Delivery Review \(available on-line March 18, 2016\)](#), James Norman provides an overview of current and potential uses of 3D printing in pharmaceutical manufacturing.

## Promises Of 3D Printing

3D printing offers the possibility of making customized products on a cost-effective basis. At the USPTO conference, John Cheek, Deputy Chief IP Counsel of Caterpillar Inc., highlighted the advantages of 3D printing for the automobile industry, which has used 3D printing technology since the 1980s. He noted that using 3D printing to make automotive parts can offer advantages including reduced costs, reduced weight, and increased quality. 3D printing also permits companies to make products (or parts) on demand. Indeed, instead of making parts themselves, companies can send customers (or retailers) a CAD file to use in their own 3D printers.

## Pitfalls Of 3D Printing

The features that make 3D printing advantageous for manufacturers also make it easier for competitors to produce high quality copies of patented objects. All a would-be infringer needs is a CAD file for the object and access to a 3D printer. CAD files for all kinds of objects are available over the internet. If a CAD file is not readily available, a 3D scanner can be used to generate a CAD file for the object. The availability of 3D printers also is rapidly expanding, and a number of companies offer 3D printing services. These advances in 3D printing make it easier to copy patented objects.

The availability of 3D printing also makes it more challenging to enforce patent rights. At the USPTO conference, Professors Tim Holbrook and Lucas Osborn discussed the problems of enforcing patents on products that can be easily 3D printed, and referred to their recent article, "Digital Patent Infringement in an Era of 3D Printing," 48 *U.C.D.L. Rev.* 1319 (2015). They noted that because CAD files are not considered component parts of an invention, providing CAD files is not considered contributory infringement. They explained that while sharing CAD files might be considered inducing infringement, liability for induced infringement requires (i) an act of direct infringement, (ii) specific intent to induce infringement, and (iii) an affirmative act by the inducer.

As to the first requirement, it may be difficult or impossible to identify direct infringers in the 3D printing context, because a direct infringer may anonymously download the CAD file over the internet and print the object at home. As to the second requirement, it may be difficult to prove specific intent to induce infringement, since the company selling the CAD file may not know the object is patented.

Patent holders concerned with these issues may not take much comfort if they look to the experiences of the music industry, which struggles to protect copyrights in the age of digital downloads.

## Implications For Patent Protection

Inventors protecting objects susceptible to 3D printing may try to obtain patents that encompass CAD files and 3D printing methods. However, obtaining and enforcing such claims can be difficult in light of current jurisprudence surrounding patenting abstract ideas and software under *Alice* and *Bilski*. Indeed, protecting inventions against copying by 3D printing is a challenge under a patent system focused on tangible things, and highlights the tension between an economy that values intangible innovation and a patent system that excludes such innovation from protection.

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