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INTELLECTUAL PROPERTY

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IP Issues With Additive Manufacturing

3-D TECHNOLOGY COULD REVOLUTIONIZE PRODUCT DESIGN, PRODUCTION

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Additive Manufacturing (AM) is a new production technology that is transforming the way all sorts of things are made. President Barack Obama, in his 2013 State of the Union Address, talked about 3-D Printing, one AM process, as having the potential to revolutionize the way we make everything. With the rise of AM comes a multitude of new legal issues, particularly in the intellectual property area.

AM makes three-dimensional (3D) solid objects of virtually any shape from a digital model. Generally, this is achieved by creating a digital blueprint of a desired solid object with computer-aided design (CAD) modeling software and then "slicing" that virtual blueprint into very small digital cross-sections. These cross-sections are formed or printed in a sequential layering process in an AM machine to create the 3D object.

Alternatively to creating the virtual blueprint with a CAD program, the virtual blueprint can also be made by scanning an existing 3D object and then transferring the digital scanned object to the CAD software. In

the latter case, it is possible to create a very accurate solid reproduction of that scanned object within one day, even in another country. The scanning device can be as simple as the camera on a smartphone. Thus, it is very easy to either create new objects or reproduce old objects. Additive manufacturing grew out of the rapid prototyping industry, where a simple or a few solid objects were made from digital blueprints. Additive manufacturing is truly a new frontier, with no apparent boundaries in sight.

AM has many advantages, including dramatically reducing the time from design to prototyping to commercial product. It also decreases the amount of waste and raw materials. AM also facilitates production of extremely complex geometrical parts. AM also reduces the parts inventory for a business since parts can be quickly made on-demand and on-site. However, AM has the major disadvantage that it increases the ease of making counterfeit goods.

Given this background, a wide variety of intellectual property law issues arise in the AM field. Utility patents, design patents, copyrights, trademarks, trade secrets, and intellectual property agreements all have to be considered.

Utility Patents

Utility patents can cover a wide variety of function aspects of an invention in the additive manufacturing field. Each patentable invention must be useful, new, and not obvious (or possesses an inventive step). The 3D objects made may be patentable articles of manufacture. The AM machines may be patentable apparatus. The materials used to make the three-dimensional objects may be patentable compositions. The process for run-

ning these machines may be patentable processes. The various types of software used in conjunction with the additive manufacturing machine may also be patentable. It should be recognized that the patentability standard for software inventions is still evolving and drafters of such patent applications should consider the ongoing case law in this area.

Since AM can rapidly convert a concept into a design into a prototype into a commercial product, and when coupled with the first-to-file provisions of the new American Invent Act, patent attorneys and agents will need to file patent applications in this technical area quickly.

Also, in doing patentability and freedom-to-operate analysis for their clients, attorneys will have to efficiently search U.S. Patent and Trademark Office classes to find the relevant patent prior art. The new USPTO patent collection of additive manufacturing patents and published patent applications can make such searches easier to conduct. Patent searchers should also be aware of the ongoing proliferation of prior art in this technical area and update those searches periodically to catch later published, but earlier filed, patent applications.

Where the 3D object is patented, the patentee may have patent infringement action



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against not only the seller of a knock-off part made by AM process, but possibly also against the individual or company creating the CAD files for that object under the doctrines of contributory infringement or inducement of infringement.

Patent attorneys or agents filing patent applications made by traditional subtractive methods of production should consider adding disclosure to their patents that such products can be made by additive manufacturing techniques as well.

Because utility patents typically take years to obtain and are relatively expensive to obtain compared to the other types of intellectual property (IP) discussed herein, they should be filed to cover the basic aspects of the owner's invention and used together with the other forms of protection. As always, the IP strategy for any product should follow the business strategy for that product.

Design Patents

Design patents can protect the ornamental features of a functional design. They are more inexpensive to obtain and offer 14 years of protection in the U.S. If the 3D product acquires distinctiveness during this period of design patent protection, that product can be further protected by trademark. For example, consider a unique and ornamental jewelry product made by AM processes: it may be protected by both design patent and later by trademark.

Copyrights

Copyrights protect original works of authorship fixed in a tangible medium of expression. The protected rights under the copyright laws include the rights to reproduce the work; to distribute those works; and to modify those works (make derivative works).

However, the 1976 Copyright Act legislative history states that no copyright protection is provided for industrial products that have "aesthetically satisfying and valuable shapes" except their "physically or conceptually" severable elements. The test for this conceptual separability was stated in the case of *Brandir International v. Cascade Pacific Lumber* involving a ribbon-type bike rack that was held to be not protectable by a copyright.

That test is if the design elements reflect a merger of aesthetic and functional considerations, the artistic aspects of a work cannot be said to be conceptually separable from the utilitarian elements. In contrast, where the design elements can be identified as reflecting the designer's artistic judgment exercised independently of functional influences, conceptual separability exists and those design elements are protectable by copyright.

Copyright protection should be considered for the 3D object made as well as the CAD file used to create that object. As to 3D objects, what is protectable depends upon whether the object is merely useful or has separate creative design elements. As to the CAD file used to create that object, what is protectable also depends on whether the CAD file was created from a scanned object or was independently created by an author using a CAD program.

Under U.S. copyright laws, secondary liability such as contributory infringement, vicarious infringement, and inducement are also actionable. Accordingly, where a copyrighted work exists, the individual or company making copies of that work with a scanned CAD file may be liable since those CAD files are "copies" of the scanned 3D object even though it is in a different medium.

Michael Weinberg, of Public Knowledge, a digital advocacy group, has written extensively on copyrights and AM. He warns copyright

owners of 3D objects not to take the same course of actions that did not work for the music business, but to consider selling or giving away CAD files for their copyrighted works to customers to create a new line of business.

Trademarks

Trademarks serve as an identification of the source of goods. Long-term trademark protection may be the most valuable IP protection for distinctive 3D objects. However, in additive manufacturing, the same object may be available from multiple sources by the transfer of the CAD files. It may be useful for the original source to take steps to distinguish its goods from other sources (e.g., to slightly vary the CAD files). In addition, the original source might add their trademark to the CAD file (in the computer code) so it is printed on the object to further identify the source of the trademark object.

Trade Secrets

Trade secrets include non-public information that gives a competitive advantage. An attempt to maintain confidentiality must be made to have trade secret protection. Important AM trade secrets are process information such as the exact materials used, the operating settings on the AM machine, and the exact nature of the slicing software used as well as premature disclosure of the CAD files or the shape of the 3D objects before planned commercial introduction.

The risks of their disclosure can be minimized by having in place good IP agreements that clearly set forth who owns and can use the software used in the AM process and the 3D objects made. These IP agreements include employment agreements, non-competition agreements, development agreements, joint development agreements, non-disclosure agreements, and consulting agreements.

Non-IP Legal Issues

Additive manufacturing also raises many non-IP issues. Safety and regulatory issues such as export licenses needed to be considered. Also, product liability issues arise when the same goods are made by different individuals or companies. Anti-counterfeiting laws and treaties will come into play. On a positive note, opportunities for new types of retailing and franchising are bound to develop as the AM industry develops. ■

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