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qLegal Toolkits

3D Printing and Intellectual Property Law: Key Considerations

This toolkit is going to practically analyse 3D printing of a car bonnet, while exploring the commercial impact of intellectual property rights on 3D printing.

Introduction - What is 3D printing?

3D printing is considered as a revolutionary manufacturing technology which was introduced in 1983. 3D printing uses additive technology, which allows the user to create a physical object (three dimensional object) using computer aided design (CAD) methods. The physical object can be of any size, shape or geometry and can be made of a wide range of materials. The advent of this innovative technology has significantly contributed to several industries which include automobiles, aerospace, defence, healthcare and fashion. Today, 3D printing technology is also exploited by consumers to create their own products giving rise to 'do-it-yourself' manufacturers. This technology enables users to manufacture products which infringe the intellectual property rights of original owners. Thus, owners of such products could be threatened by the potential infringement of their intellectual property rights. Due to this, there is a pressing need to stress the importance of IP rights in relation to 3D printing.

Practical aspects of 3D printing – Car bonnet example

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The process of 3D printing of vehicle parts consists of the successive building up of layers of materials (wood, plastic and metal). 3D printing has major advantages over traditional manufacturing methods. Consider a Mini rally car, where manufacturing the aerodynamic shape of the bonnet is time consuming and expensive, because of its shape. To overcome this, 3D printing techniques are used to manufacture car parts quickly, which are not as expensive as the traditional manufacturing methods.

3D Printing and Trade Marks

The central function of a trade mark is the protection of brand image and the protection against the unauthorised commercial exploitation of such brand. Trade marks do this because they constitute a 'badge of origin' of the goods or services a business entity offers. Once successfully registered, a trade mark grants the proprietor an exclusive economic right to use the trade mark in connection with certain goods or services. This monopoly right has significant financial implications for the owner of the right. Over the years other functions have been recognised and it is worth appreciating that a trade mark can safeguard, not only the reputation of a brand by indicating the quality of the products or services, but it can also often act as means of advertising.

Trade marks can consist of many things, including, amongst other elements, words, logos, shapes, colours and slogans. Registering shape marks can be particularly difficult, but it is not impossible. In Europe, the presumption is that all marks are registrable, although certain criteria have to be met in order for the mark to fulfil its function as a trade mark. Representation of signs has to be clear, precise, self-contained, easily-accessible, intelligible, durable and objective.

For the purpose of 3D printing, infringement can occur if a copy of an object containing a trade mark is reproduced via the 3D printer without a licence from the trademark owner. Even if these marks are not registered with the Intellectual Property Office, they may be protected under the law of unregistered trade marks and the tort of passing off.

An additional requirement for infringement to occur is for the trade mark to be used in the course of trade. Therefore, if a single copy is printed by a private individual and not used in commerce, then there will be no

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trade mark infringement. However, if the person moves on to selling the copies, then infringement will occur because the relevant public will be confused as to the origin of the sold copies. This reflects the underlying idea that trade mark law is tailored to protect the 'well-informed, reasonably observant and circumspect' consumer in the marketplace, who in these circumstances will link the infringing copy to the original trade mark proprietor.

To link this to our current example - a 3D printed bonnet of a car may include the trade mark of the car company. This in most circumstances will be logo of the car company - for example the Mercedes Benz three-pointed star. This will be on display at the front of the car and will immediately lead to confusion by the average consumer, who would certainly link the car to the Mercedes Benz company. Consequently, trade mark infringement would have occurred.

3D printing and Copyright law

In the UK, copyright law protects the way in which original literary, artistic, dramatic and musical works are expressed. Copyright laws provide the author with exclusive economic rights to control copying, distribution, communication or adaption of a work and also provide the author with so-called moral rights, which include the right to be identified as the author and to object to derogatory treatment of a work. These rights arise automatically without the need for registration, and may last for as long as 70 years after the death of the author.

There are a number of ways in which copyright law might impact upon the users of 3D printers. Where a person prints an object using their 3D printer, they might be infringing a copyright owner's right to copy or adapt their work. For example, older cars produced by British automobile manufacturer Jaguar featured an iconic sculptural hood ornament, in the shape of a jumping Jaguar big cat. If someone was to 3D print a replica hood ornament they may infringe copyright in the sculpture.

The CAD file used to print the object may also itself be protected by copyright law. Online 3D printing repositories and design communities, such as Thingverse, where users upload and share CAD files also run the risk of being held responsible for copyright infringements by their users (which is why they require

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uploaders to confirm that they own the rights in any creations they upload, and provide ways to report and take down infringing files on their website).

The main types of copyright protected objects which may be impacted by 3d printing are sculptures, which is a subcategory of the type of artistic works protected by copyright. The types of sculptures which are protected by copyright law is not completely certain, but go beyond the category of items a person would normally expect to find in an art gallery. For an item to be a sculpture it should have been created with at least part of its purpose to be visually appealing. As a result, many items commonly made on 3D printers, such as toys, jewellery and models may be protected by copyright as sculptures. Copyright law also protects the CAD files used by 3D printers. These CAD files are protected in much the same way as a book, story or other literary work, and cannot be reproduced without the permission of the author of the file.

Sometimes a fair dealing defence to copyright infringement may apply, permitting you to copy a work without requiring permission or paying the copyright owner. Most relevantly to home 3D printing users, it is not an infringement of copyright to copy a protected work that you own where the copy is made for your own personal use and for purposes which are neither directly nor indirectly commercial. As a result, you can scan and 3D print a copy of a sculpture you own, such as making a copy of your jewellery or toys.

3D Printing and Design law

Designs law protects the appearance of the whole or a part of a product. Features which are dictated by functional considerations cannot be protected. Designs can be protected under UK law as either registered designs or as unregistered designs, and as a community registered or unregistered design. In order to be protected a design must be new and have an individual character, which means that the overall impression it produces on an informed user differs from the overall impression produced on such a user by pre-existing designs. Design rights protect the appearance of many objects encountered in everyday life, such as the shape of furniture or toothbrushes. The shape of the bonnet or hood of a car, if new and with individual character, could similarly be protected under designs law.

The duration of protection for designs depends on whether protection is sought at the EU or UK level, and the design owner has unregistered or registered rights; at a minimum, designs are protected from 3 years

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from the date they were first made available to the public up to protection for 25 years for a registered design.

Similarly to the personal use fair dealing defence in copyright law, an exception for designs infringement exists where the act is done privately and for non-commercial purposes. Therefore, if an object is printed at home by a 3D printing enthusiast for their personal use and the item is not sold, then any design right in the appearance of the object will not be infringed.

Copyright and design law practical advice

If you stick to printing objects you have created and designed yourself, you should generally avoid liability for copyright and design infringement. If however you copy sculptures or objects (particularly when using a 3D scanner) you should be careful as to whether you are reproducing others' work. While defences exist in the law permitting you to print personal, non-commercial 3D copies of items, you should be very careful if you intend to begin selling someone else's creations.

While there have been no major copyright or design cases against 3D printing home users yet, there have been a number of recent instances where lawyers have requested CAD files be no longer distributed. Recent examples include a request from lawyers for singer Katy Perry to stop distributing a 3D printed model of a shark from her 2015 Superbowl half time show performance (http://www.bbc.co.uk/news/technology-31164440) and a request for a replica Throne from the TV series 'Game of Thrones' to also be removed (http://www.wired.com/2013/02/got-hbo-cease-and-desist/). It is likely that as consumer 3D printing technology becomes cheaper and more widely used, more copyright and design infringements will be identified.

3D printers and patent law

Patents allow you to protect your invention. It will give you the following rights:

- The right to control how third parties will commercially use your invention through licensing
- The right to assign or transfer the ownership of a patent and to conclude licensing agreements.

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The term for a European patent is 20 years from the date of filing the application.

A person infringes a patent where the product or process is made, used, offered for sale, and sold applying the patented invention without the proprietor's consent.

In terms of 3D printing many patents exist for the printer itself, for the process or method used to work the printer and finally, the printed product could be patented.

If a 3D printer is used to *make*, to *reproduce* and to *commercialise* a patented product without the consent of the patent holder, infringement will occur. Furthermore, if a patent protects a process, a method of making an object but not the object itself, provided that a new method of producing an object with a 3D printer is used, there will be no patent infringement for reproducing such an object.

Someone printing a copy of a patented product will be held liable for patent infringement.

Nevertheless, in order to constitute patent infringement the law requires that the use must be done for commercial purposes. This follows the exceptions of private and non-commercial use. In other words, if you print a patented invention but keep it at home you will not be infringing the patent even though you might be infringing other rights.

As a result, if the reproduction or use is made for non-commercial purposes, for private use for instance, there will not be any infringement.

In addition, an exception exists if the reproduction is made for experimental use, in which case there will not be any infringement.

As patent infringement cases are extremely costly for both parties, litigation on printed objects has not yet arisen. Litigation in regard to 3D printing has been about the printers themselves, between large manufacturers of these printers.

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Returning to the example of vehicle parts, the issue at hand is that 3D printing could potentially lead to the possibility for anyone to print spare parts. These spare parts may be part of a patented invention and therefore could be infringing the patentee's rights.

Parts of the bonnet of a car or the bonnet itself might be patented as for the increase of airflow towards the engine. As a result, if a garage decides to print these parts instead of buying them from the manufacturer, they could potentially be held liable for patent infringement.

The Commercial impact of 3D printing as a disruptive technology

Although we do not know the full impact of 3D printing yet, many predict this technology will inspire a new industrial revolution. 3D printing can be seen as being disruptive to traditional manufacturing processes and technology, because it makes it more accessible, given its lower cost and the size of the machinery required.

3D printing offers an opportunity for companies to reorganise their supply chains and business models, concentrating on the on-demand manufacturing, ensuring that companies can concentrate on producing products in high demand, as opposed to manufacturing products generically and hope for them to be sold. It is contended that 3D printing might cause the traditional supply chain consisting of traditional manufacturing, delivery and warehousing to be completely eradicated and offer an opportunity for savings. However, 3D printing is a cheaper alternative to production only when there is a small quantity of goods to be produced. Due to the availability of large economies of scale that make the production of a large quantity of goods substantially cheaper, traditional manufacturing continues to trump this new technology in this aspect.

3D printing has a potential of becoming increasingly popular amongst DIY enthusiasts, enabling the creation of daily household items that would normally be acquired in a shop and eliminating the need for financial, technological and human capital in production. Following the example of a car bonnet, a person who may need a bonnet replacement could easily print a new bonnet using the new technology as opposed to relying on spare part manufacturers and the same analogy could be followed with a variety of other products. This of course would give rise to Intellectual Property issues as discussed above.

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There is an incentive for companies to invest in 3D printing hardware as there is an enhanced pace and flexibility in which research and development can be conducted, resulting in speedier product launches and customisation. 3D Printing can be used for high-speed creation of templates, while evading the traditional expenses of creating a prototype. It is more efficient in that it reduces the amount of waste material generated when producing complex parts in comparison to traditional manufacturing processes. Those industries for which timely import of otherwise long-awaited parts are also very interested in 3D printing. It also offers an opportunity for the companies to customise their products for consumers and enhance consumer loyalty, gaining competitive advantage.

In terms of employment, 3D printing is a double-edged sword. It could lead unskilled workers in the traditional manufacturing sector into unemployment while simultaneously increase the employment opportunities for skilled workers who know how to operate this new technology. Steering through this changing environment in adopting this new technology requires businesses to have a sound degree of foresight and pragmatism.

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