

3D Printing – Design revolution or intellectual property nightmare?

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From King Kong the Musical’s animatronic ape to medical devices and dental prosthetics, 3D printing is set to transform manufacturing and design but it could also pose serious dilemmas for those seeking to protect intellectual property.

Key takeaways

- + Registering designs under the Designs Act 2003 could offer the best protection from copying by 3D printing technology.
- + The expansion of 3D printing may see a rise in applications for shape trademarks and further testing of the boundaries of what is a ‘functional’ shape.
- + Copyright is not likely to provide protection for designers and manufacturers of products that are produced industrially.

Additive manufacturing, otherwise known as 3D printing is predicted by some commentators to transform the landscape in which businesses in the manufacturing and design-based industries operate.¹

We have become accustomed to cases about copying and illegal file sharing of music, videos and software over the internet, and the efforts of both industry bodies and intellectual property owners to attempt to control that copying. Those cases focus almost exclusively on copyright as that is the main intellectual property right that exists in those types of works. The copying made possible as a result of 3D printing means that a far broader range of products may be copied, and consequently other areas of intellectual property law such as design rights, patents and shape trademarks are likely to be tested.

Practitioners advising designers and manufacturers are likely to find the best protection against unauthorised 3D printing by registering designs under the Designs Act 2003. Shape trademarks and patents might also provide some level of protection. On the other hand, copyright, the consumer law and the tort of passing off are unlikely to provide much protection against unauthorised copying.

As design and patent protection depend on registration, and can be defeated by publication anywhere in the world, lawyers advising designers and manufacturers will need to pursue these protections before releasing their client’s products. Nondisclosure agreements will also likely be important. Practitioners should be aware that their clients may also need to revise their enforcement strategies, for example through education, the additional use of product ‘authentication mechanisms’ and by devising strategies for dealing with potentially multiple smaller infringers

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Background

3D printing could lead to an on-demand manufacturing model,² avoiding the need for warehouses filled up with stocks of products manufactured in a more traditional way. If so, it could represent the biggest revolution in consumer product manufacturing for decades if not longer.

Benefits of 3D printing compared to traditional manufacturing techniques include the fact that it allows the manufacture of most objects from prototype to end product in a matter of hours, results in lower shipping and packaging costs related to overseas parts suppliers, requires less human resources and allows the use of cheaper and sometimes more reliable raw materials (as well as reduced wastage of materials in the manufacturing process).

Weighing against the practical and economic advantages of this new technology however, is the potential for loss of sales of genuine products caused by widespread unauthorised 3D copying and printing. The potential impact that this type of copying could have on the manufacturing and design-based industries could mirror the impact on the music and film industries of widespread unauthorised digital copying and digital downloads.

Currently, the impact of 3D printing technology is likely to be limited by economic factors. 3D printing technology is still relatively expensive and therefore not readily accessible to the consumer market and the marketplace is already crowded with low-volume commercial copying through 'small order' cheap manufacturers in countries such as China. However, as the cost of the technology falls and becomes closer to the cost of small-run manufacturing, the impact of 3D printing is likely to increase significantly.

Whether it has the potential to be as disruptive as the development of digital cameras was to the photography industry remains to be seen. However, designers and manufacturers do not appear to be ready for such a fundamental change in product supply.

One of the most immediate potential responses to the issues is through reliance on intellectual property rights. In future, practitioners working with designers and manufacturers will need to become increasingly vigilant about protecting their client's rights to prevent their businesses suffering as a result of unauthorised 3D printing. Delay in action could be costly.

How does 3D printing work?

A 3D printer creates a 3D object using an additive process. This means creating a virtual 3D model by deconstructing a 3D object into 2D slices and then 'printing' the 3D object by laying down layer upon layer of material such as titanium, plastic, powder or polymer. The multiple layers are gradually printed one on top of the other to create the finished item. 3D printing can be contrasted with traditional machining techniques (subtractive processes) which mostly rely on the removal of material including by drilling and cutting.

3D printers have already been shown capable of being used to make an incredibly broad range of items, ranging from static items such as sculptures and toys, items with movable parts such as bicycles, right through to medical devices and complex industrial items such as drilling machinery.

The 3D model that is used for the basis of the 3D object to be printed can either be created from scratch using 3D modelling software, scanned into the computer using a 3D scanner, or downloaded from the internet. Sites such as Thingiverse (www.thingiverse.com) and Shapeways (www.shapeways.com) specialise in allowing uploading and sharing of object files. File-sharing sites such as the Pirate Bay are also increasingly offering such files, whether or not they are legitimate.

At the present time, a good quality 3D printer costs approximately A\$20,000³ or more, but as 3D printers inevitably become cheaper and enter the mainstream, copying of objects through 3D printing could feasibly become widespread among retailers and consumers.



Registered design rights

One form of intellectual property protection that should be considered by those advising designers and manufacturers is the system of registered designs. Unfortunately, design protection is not well understood or utilised in Australia. Many designers do not become aware of the need to register designs until their product is already on the market and being copied, when it is too late to do so.

Registered designs are protected in Australia under the Designs Act 2003. Registration of an application is straightforward and will occur after a preliminary formalities check. A registered design is valid for 10 years from the date of filing. Before a design registration can be enforced, the registration must be certified.⁴ It is at this stage that the validity of the design is tested. The test applied by the registrar as part of the substantive examination is whether there is a “design”⁵ and whether the design is “novel and distinctive”⁶ as compared with the prior art base. This prior art base includes designs that have been used in Australia, or published in a document in Australia or overseas⁷ including disclosure in a published design application. In practice, this means a design application must be filed before a product is sold or promoted anywhere in the world.

The Designs Act contains robust infringement provisions against designs which are “substantially similar in overall impression”⁸ as well as direct imitations. The potential application of this test for infringement in the case of a 3D printed copy is obvious. Since 3D printing often involves creating a 3D model from the original 3D object, attempting to match its design and form exactly, it could well constitute an infringement of a registered design. For this reason, designers and manufacturers should be advised to register their designs under the *Designs Act*.

On the other hand, in practice, the rights protected by registered designs are relatively narrow and would not prevent 3D copies that differ sufficiently from the registered design. The Australian authorities confirm that relatively slight alterations to the design may be sufficient to avoid infringement, particularly where a number of similar products are already on the market.⁹ This may be more relevant to certain products than others, particularly in the consumer goods market where there are many products with small variations between them.

Patents

A patent is a right that is granted for any device, substance, method or process that is new, inventive, and useful. Australia has a two-tier patent system, providing for the grant of standard patents having a 20-year term and “innovation” patents having eight years duration. A standard patent gives the patent owner exclusive rights to commercially exploit the invention for the life of the patent (20 years). Innovation patents provide similar rights for a lesser period (eight years) and are intended for low-level inventions or developments. Patent protection is gained through registration with IP Australia, and in the case of a standard patent, the assessment of whether the invention is new, inventive and useful will be made during examination.¹⁰ While innovation patents are not automatically examined before grant, they must be “certified” by examination, prior to enforcement.

Even if a design does not meet the inventive threshold for a standard patent, it may still be eligible for an innovation patent. This type of patent requires an innovative step (as opposed to an inventive step) to protect an incremental advance on existing technology.¹¹ An innovative step exists when the invention is different from what is known before, and the difference makes a substantial contribution to the working of the invention. An innovation patent is usually granted within a month of filing the complete application as there is a simple formalities check at the time of the application,¹² and the term of protection is eight years as opposed to the 20 year protection granted to a standard patent. Innovation patents have proved to be an effective form of protection in Australia.

In this era of cutting-edge technology, it would be easy to assume that patent protection is only relevant to state-of-the-art products, such as electronics and biotechnology. Given that the current focus of 3D printing is the production of plastic and polymer objects, it might seem unlikely that anything created by 3D printing would likely infringe a patent. For instance, a process patent that protects the method by which a product is made is unlikely to be infringed by its 3D reproduction.

However, the reality is that a huge number of registered patents relate to simple everyday objects, such as kitchen and ‘do-it-yourself’ gadgets. Patents can be obtained for such products where the underlying inventive concepts satisfy the usual thresholds for patentability, including novelty and inventive step (non-obviousness). Process patents can also be obtained for new and inventive uses of such products.

Contributory infringement (or ‘indirect infringement’) arises under s.117 of the Patents Act 1990 where a (potentially unpatented) product has been supplied with instructions or inducements to a third party to infringe a patented product or process. Although untested, such infringement by supply¹³ may provide a basis for obtaining relief against 3D printers of products that are in turn used to infringe method patents or alternatively, in the further manufactured patented products.

In addition, it should be borne in mind that a 3D printer may currently be used to replicate simple machines, not just solid objects. As 3D printing technology continues to develop, businesses are likely to look to patent protection to safeguard their complex products and technology against the risk of unauthorised copying.





Trademarks

The most obvious source of trademark protection in the context of 3D printing is registration of a shape trademark. As with trademarks for plain words, the shape of a product can only be registered if it is distinctive of the goods and services for which it is to be registered. Case law has established that if the shape is dictated by the nature or the function of the goods it cannot be registered¹⁴ (although the definition of “functional” in this context remains to be determined). Nonetheless, even if a mark is not inherently distinctive, it is theoretically possible for distinctiveness of functional shapes to be acquired through use.

There are approximately 1,000 current registrations for shape trademarks on the Australian Trademarks Register for a wide range of goods, for example, the shape of the Weber barbeque, Bic biro, Gibson guitar, Yakult bottle, Camper shoe design and Hermès handbag. Given that shape trademarks are adapted to cover such a wide range of goods, we anticipate that the expansion of 3D printing may see a rise in applications for shape trademarks and a further testing of the boundaries of what is and is not a ‘functional’ shape. A shape trademark registration has the additional benefit that it is a potentially indefinite right as the initial registration period is 10 years, renewable indefinitely¹⁵ on payment of the relevant fees.

Some products, for example, Mattel plastic toys, will have a trademark stamped on them or featuring as part of a raised surface on the goods themselves. If the relevant mark is reproduced as part of the 3D copying and printing process, this would give the trademark owner a straightforward claim for trademark infringement.

The position is more complex if the trademark is removed and does not appear on the 3D copied goods. In this situation, there may be potential liability under s.145 of the *Trademarks Act 1995*¹⁶ which makes it an offence to falsify or unlawfully remove a trademark that “has been applied in relation to any goods or services that are being, or are to be dealt with or provided in the course of trade”. The wording of this section appears to be intentionally broad as s.9 clarifies that a trademark is taken to be “applied in relation to goods or services” if it is “used in a manner likely to lead persons to believe that it describes or designates the goods or services”. Section 147 of the *Trademarks Act* similarly provides for an offence where a person uses a device to draw a registered trademark. Complaints are rarely brought under these sections because they carry the higher criminal “beyond reasonable doubt” standard of proof and require that the infringer acts knowingly or recklessly as to whether the mark is registered. However, as claimants search for ammunition against 3D printing, it will be interesting to see if any prosecutions under these sections are pursued.

Copyright

While action in relation to illegal downloading and file sharing of music, videos and software over the internet focus almost exclusively on copyright, generally, this protection is not available in relation to industrial designs.

The *Copyright Act 1968*¹⁷ expressly denies protection in relation to corresponding designs which have been industrially applied¹⁸ (generally, where more than 50 articles of the design have been produced). It reflects a policy in Australia to encourage the use of registered designs rather than copyright to protect industrial products. This is in contrast to New Zealand, France, and the US, among other countries, which provide copyright protection for at least some industrially applied designs.

The limitation does not apply to a two dimensional artistic work applied to a flat surface on a mass-produced article (such as a t-shirt or a wallpaper design) because two dimensional objects do not fall within the definition of “corresponding design” under the *Copyright Act*. This is likely to be of little benefit to designers whose three-dimensional designs could be reproduced through 3D printing.

There are limited exceptions in relation to a specific type of copyright work, called a “work of artistic craftsmanship”. Whether or not a work is a work of artistic craftsmanship depends on the extent to which the particular work’s artistic expression, in its form, is unconstrained by functional considerations. Generally, the greater the requirements in a design brief to satisfy utilitarian considerations, the less scope to encourage substantial artistic effort. Works of artistic craftsmanship may include less utilitarian items such as jewellery or decorative fabrics, but most functional items won’t fall into this category even if they are attractive in appearance, including yacht hulls,¹⁹ rabbitshaped corkscrews,²⁰ and mass-produced furniture.²¹

As a result, copyright protection is not likely to provide protection for designers and manufacturers of products that are produced industrially, as they are likely to lose the capacity to enforce any copyright in the design as soon as it is industrially applied to legitimate products.

The Australian Consumer Law and the tort of passing off

Instead, many designers have looked to the misleading and deceptive conduct provisions of the Australian Consumer Law or the tort of passing off as a fallback means to protect against copying of designs. The history of such attempts is littered with failures. Courts have consistently refused to allow a supplier to use misleading or deceptive conduct or false endorsement claims to prevent competitors from creating products that are identical, unless there is some additional factor at work.²² Similarly, the courts have affirmed that attempts to prevent copying of designs will not succeed where the copy products clearly display brands differentiating them from the original product.²³ Ultimately, only time will tell whether 3D printing is a design revolution or an intellectual property nightmare.



Endnotes

1. C. Jewell (2013), "3-D Printing and the Future of Stuff", retrieved from the World Intellectual Property Organization website 20 August 2013, tinyurl.com/lw9kmn9.
2. L. Sullivan (2011), "OEMs, Retailers Push On-Demand Manufacturing", retrieved from the EBN website 20 August 2013, tinyurl.com/mmq5jzo.
3. Although note that there are consumer models available at much cheaper prices, around AU\$1,500.
4. *Designs Act 2003* (Cth) s.73(3).
5. *Ibid* s.6.
6. *Ibid* s.15.
7. *Ibid* s.15(2).
8. Above n.4 ss.71(1)(a), 71(3), 19(1).
9. *Review 2 Pty Ltd v Redberry Enterprises Pty Ltd* [2008] FCA 1588.
10. *Patents Act 1990* (Cth) s.49.
11. *Ibid* s.62.
12. *Ibid* s.52.
13. *Ibid* s.17.
14. *Koninklijke Philips Electronics v Remington Products Australia* (2000) FCR 90.
15. Ongoing registration is subject to use requirements and the continuing distinctiveness of the mark.
16. *Trademarks Act 1995* (Cth).
17. *Copyright Act 1968* (Cth).
18. *Ibid* ss.74-77.
19. *Burge v Swarbrick* [2007] HCA 17.
20. *Sheldon and Hammond Pty Ltd V Metrokane Inc and Others* 61 IPR .
21. UK case of *George Hensher v Restawhile Upholstery* [1974] 2 All ER 420.
22. *Parkdale Custom Built Furniture Pty Ltd v Puxu Pty Ltd* (1982) 149 CLR 191; *Dr Martens Australia Pty Ltd v Figgins Holdings Pty Ltd* (1999) 44 IPR 281 (although one case brought by Dr Martens did succeed as, in addition to copying the boot design, the knockoff product featured the additionally misleading words "the Original"); *Koninklijke Philips Electronics v Remington Products Australia* (2000) FCR 90.
23. *Peter Bodum A/S & Ors v DKSH Australia Pty Ltd* [2011] FCAFC 98.

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