



THE EXISTING LEGAL FRAMEWORK OF INTELLECTUAL PROPERTY AND 3D PRINTING

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ABSTRACT

3D printing technology has advanced as the next revolutionary technology of the current epoch with ample momentum to rebuild almost every aspect of society. The limits of additive manufacturing technology are increasingly growing, from lithium-ion batteries to human organs. Predominantly confined for industrial applications, additive manufacturing is widely recognized in commercial and consumer usage. A major rise in the conflicts over intellectual property among those trying to profit from this transformative technology comes with larger-scale adoption. In order to survive these inevitable disputes over valuable intellectual property assets, holders of rights need to be aware of the applicable, dynamic, and rapidly changing legal framework, with its many incentives and ambiguities. This article recognizes the relationship between Intellectual Property and 3D printing. Primarily, the article helps to understand the existing legal framework of Intellectual Property in India with reference to 3D printing, followed by other countries such as the United States of America, the United Kingdom, and the People's Republic of

China. In addition, having to understand the threat that 3D printing is causing to the existing legislations, the challenges faced by the Intellectual Property law with special emphasis on India is explained in detail.

INTRODUCTION

The capacity to generate and duplicate three-dimensional (hereinafter, '3D') objects from a single device is an exceptional technology that has been aspired by many science-fiction writers. The existence of such aspiration is currently known as additive manufacturing, popularly referred to as 3D printing.¹ Technically, it is a process of constructing three-dimensional objects from a digital 3D model or Computer-Aided Design (hereinafter, 'CAD') model by the use of 3D modeling software.² It is important to note that there have been consistent advancements in the additive manufacturing technology in the past few decades.³ Although the machines in the present are not essentially the replicators of Star Trek, the ability of modern technology with regard to the size, components, and resolution of the concluded product have transitioned 3D printing from imagination to a critical source of development.

The influence of 3D printing on modern civilization has both its advantages and disadvantages. The capability to build prototypes almost instantaneously and to produce custom designs cost-effectively can transfigure the modern world. However, the accessibility of the technology at the

¹ David Santos González & Almudena González Álvarez, *Additive Manufacturing Feasibility Study & Technology Demonstration*, EDA, 10 (2018).

² *What is 3D Printing?*, 3D Printing (July 12, 2020, 12:23 PM), <https://3dprinting.com/what-is-3d-printing/>.

³ Dachamir Hotza et al., *Advances in Additive Manufacturing Processes and Materials*, AME (2014).



consumer level has provided a series of possible disruptive effects.⁴ In the current scenario, 3D printing has emerged to an aspect where the consumers, either through printing services or with thrifty 3D printers for home, have instant access to it.⁵ This created a major advantage to the DIY (do-it-yourself) community which embraced 3D printing rather than engaging with paid professionals.⁶

In addition, the DIY community can compose a configuration and can make that accessible to the entire world through a digital portal.⁷ 3D printing enables the DIY group to manufacture public goods in the form of usable prototypes that are freely accessible to anyone with access to a 3D printer.⁸ Further, it is important to note that if the designs printed is a duplicate of a subsisting patent, additive manufacturing explicitly permits pervasive patent infringement. The existence of Intellectual Property (hereinafter, 'IP') Legislations shall protect the rights of the patent holders. However, 3D printing affects the IP rights of the holders in various manners that the infringement subsequently falls outside the purview of the present legislations.

EXISTING INTELLECTUAL PROPERTY LEGISLATIONS IN INDIA WITH REGARD TO 3D PRINTING

The IP legislations in India can be dealt in a four-fold manner: firstly, Patents to protect

the inventions; secondly, Trademarks to differentiate the holder's services and products from others; thirdly, Copyright to protect the artistic, literary or musical works; and lastly, design registration to protect the shape and layouts of the products.⁹

PATENTS

In India, The Patents Act, 1970 is the statute regulating patents. According to Section 2(1)(j) of the Patents Act, a new product or process which comprehends an innovation may be granted a patent.¹⁰ Consequently, the patent proprietor has the exclusive right to preclude the third parties from making, using, selling, importing, or offering for sale the patented invention.¹¹ 3D printers can promote patent infringement in three different manners: firstly, using the blueprint of the patented product which directly infringes the rights of patent proprietor (direct infringement); secondly, intentionally inducing a third party to directly infringe (induced infringement); and lastly, deliberately contributing to infringement by selling or importing a component of a patented invention (contributory infringement). CAD files can be easily circulated electronically and the corresponding objects can be reproduced at several locations with minimal patent proprietor visibility. Interestingly, the stance on whether the dispersion of CAD files would constitute an infringement of a patent

⁴ Sebastian Mohr & Omera Khan, *3D Printing and Its Disruptive Impacts on Supply Chains of the Future*, 5 TIMR 20, 21 (2015).

⁵ Davis Doherty, *Downloading Infringement: Patent Law as a Roadblock to the 3D Printing Revolution*, 26 HJLT 353, 354.

⁶ Stacey Kuznetsov & Eric Paulos, *Rise of the Expert Amateur: DIY Projects, Communities, and Cultures*, PNCHRI 295, 295.

⁷ Franklin Houser, *The Ultimate Guide to 3D Printing*, All3DP (July 12, 2020, 3:01 PM), <https://all3dp.com/3d-printing-3d-printer-guide-101-questions/>.

⁸ *Id.*,

⁹ Ajay Thakur, *All you need to know about the IPR Laws in India*, iPleaders (July 13, 2020, 10:17 PM), <https://blo.g.ipleaders.in/need-know-ipr-laws-india/>.

¹⁰ The Patents Act, § 2 (1970).

¹¹ The Patents Act, § 48 (1970).



is uncertain and relies heavily on whether the making or selling of electronic incarnations of the patented product comprises a direct infringement of the rights of the patent proprietor.

TRADEMARKS

The Trade Marks Act, 1999 along with the common law protects the Trademarks in India. A trademark is registered with reference to a particular component of the products or services. Further, the inherent function of the trademark is to indicate the prospective buyers about the quality of the products or services.¹² According to the Trade Marks Act, a trademark is infringed if a mark is identical or relatively similar to the registered trademark.¹³ 3D printing will constitute a greater loss to the trademark proprietor of a particular product or service as they are dependent on their brand. To be precise, there are possibilities for the registered trademarks to be infringed with respect to the CAD files as they may comprise digital versions of the respective trademark.

COPYRIGHTS

The 1957 Copyright Act in combination with the 1958 Copyright Rules forms the legal structure regulating the protection of copyrights in India. Regardless of the registration of Copyright, the originality of the dramatic, literary, artistic or musicals works, cinematograph films, and sound recordings are protected under the Copyright Act.¹⁴ According to the copyright law, software code is usually regarded as “literary work,” and CAD files are classified as

“artistic works” with respect to the product being a drawing and involves artistic craftsmanship.¹⁵ Legal copyright infringement appears to occur when a third party utilizes the exclusive rights of the holder without permission. Consequently, the existing copyright law is inclined to adequately secure the right of the proprietor of the copyright from the unauthorized transfer of CAD files inclusive of their artistic outputs. Individually, the Copyright Act also describes a series of actions that do not entail infringement, including reasonable processing of work for private or personal benefit, including research.¹⁶ The Copyright Act will regulate the right of copyright holders to transmit CAD files to producers and suppliers, to the degree set out above. This exclusive right requires the copyright proprietor of the work to issue licenses in relation to the CAD file with limitations on its usage. CAD file licensees can also be prohibited from modifying the copyrighted work in any manner.

DESIGN

The Designs Act, 2000 deals with all kinds of designs with creative work and anything that is in the essence of a mechanical tool or any construction mode falls under its exception. Accordingly, the Designs Act would exempt certain 3D printed items that are “merely mechanical devices” under the Designs Act or “artistic works” under the Copyright Act.¹⁷ In order to protect the design from unnecessary infringement, it has to be registered. A design is registered in reference to a category of products where the design is protected only in regards to the goods for

¹² *Godfrey Phillips India Ltd. v. Gimar Food & Beverages Pvt. Ltd.*, 2 ARBLR 559 (Del. HC: 1997).

¹³ The Trade Marks Act, § 29 (1999).

¹⁴ The Copyright Act, § 13 (1957).

¹⁵ The Copyright Act, § 2 (1957).

¹⁶ The Copyright Act, § 52 (1957).

¹⁷ The Designs Act, § 2 (2000).



which registration was granted. Upon registration of a design, the proprietor shall have the exclusive right to utilize the design in any article with respect to any class in which the respective design is registered. It is pertinent to note that the occurrence of piracy of a design can be elucidated in a two-folder manner under the Designs Act: firstly, when the design is placed to a registered relevant product with an intention to sell without the approval of the holder; and secondly, when a product has been registered in relation to design with an intention to sell without the approval of the holder.¹⁸

EXISTING INTELLECTUAL PROPERTY LEGISLATIONS IN OTHER COUNTRIES WITH REGARD TO 3D PRINTING

UNITED STATES OF AMERICA

The 2D and 3D works fall under the ambit of “Pictorial, graphical and sculptural works” mentioned under Section 102(a)(5) of the Copyright law of United States (hereinafter, ‘U.S’) until their mechanical and functional aspects are considered. The respective section protects the original works of the authors immediately after fixing the tangible medium of expression.¹⁹ Section 106 of the U.S. Copyright law grants the copyright owner an exclusive privilege in regard to the works established therein.²⁰ This includes works such as sculptural and artistic works which could be printed using a 3D printer. In addition, CAD files through which the products are printed may also be protected by the copyright.²¹ Further, if the court believes

that the portions of the file are protected by copyright, then replicating that file would amount to infringement of copyright. However, if no components of the file are copyrighted, subsequently it makes it available for everyone to copy the file without need for permission. Applying for industrial design registration is one of the possible ways to protect the usage of 3D printing from infringement as it protects the artistic character of utilitarian objects. Although the protective spectrum excludes functional elements, visual aspects such as form, configuration, and embellishment will be secured. The infringement of industrial design is only stimulated when the replica made is almost identical in both appearance and feel. Consumers can prevent infringement by even minor customization. Correspondingly, rights holders must either expect possible modification points and apply for security over a multitude of variants, or only secure elements that are relatively difficult to change.²²

Considering the trademark, the consumers in order to avoid infringement remove the trademarked name or logo from the product before printing. A more complex issue arises when a product’s trade dress or distinctive guise which is free of any trademark, has acquired a secondary meaning that clearly indicates its source. Conversely, the Trademarks Act essentially needs the “use” of the logo in the commercial context to be considered as an infringement.²³ Hence it is entirely plausible that the usage of a 3D printer to build a replica of a trademarked

¹⁸ The Designs Act, § 22 (2000).

¹⁹ Copyright Act, 17 U.S.C. § 102 (1976).

²⁰ Copyright Act, 17 U.S.C. § 106 (1976).

²¹ Charlie Wapner, *3-D Printers: Understanding Copyright, Fair Use, and More*, SLJ (July 17, 2020, 1:14 AM), <https://www.slj.com/?detailStory=3-d-printing-understanding-copyright-fair-use-and-more>.

²² *3D Printing will Pose a Multifaceted Challenge to our Current Intellectual Property Laws*, Gowling WLG (July, 17, 2020, 2:52 AM), <https://gowlingwlg.com/en/insights-resources/articles/2014/3d-printing-will-pose-a-multifaceted-challenge-to/>.

²³ Trademark Act, 15 U.S.C. § 1125, § 43 (1946).



product for personal purpose may not fall under the ambit of infringement according to the law.

The U.S. patent law system acknowledges a repair and restoration doctrine.²⁴ A user may freely use the patented product after the sale of that respective product by the patent proprietor, or when the patent expires. If any part of the proprietary product breaks or fails, the customer may need to fix or remove the part that is broken or failed. The repair or replacement of such a product is legal until they generate a completely new product. In addition, if the patent holder ascertains that the ‘repair’ was actually a ‘reconstruction’, it may lead to patent infringement. However, the difference between legal repair and illegal reconstruction is still uncertain. Further, the current scenario of the repair and reconstruction doctrine gives direction as to what would deem to be a valid infringement of standards of repair and is in need of guidance from the higher courts.

Additionally, Article 1, section 8 of the U.S. Constitution grants Congress the authority to enact laws regarding patents and Congress has utilized that power accordingly.²⁵

Keeping the patent law in mind, when a product causes damage that requires redressal beyond the home, then it is necessary for the individual to buy a new product for further use. Actions that are contradictory to this are considered either as an unwarranted reconstruction of the object or an extensive repair to entirely build a new article.²⁶ This requirement is effective even if a user is ignorant of the existence of that particular patent. However, it is possible for the

consumer to replace the minor elements of the object using a home 3D printer. Existing legal precedence explains the extreme ends of the discussion regarding repair and restoration doctrine, but leaves considerable gray ground where 3D printing technology is likely to escalate.

UNITED KINGDOM

The United Kingdom Patents Act, 1977 is the United Kingdom’s (hereinafter, ‘UK’) prime aspect of patent law legislation. As with many other national Patent Acts in Europe, much of its substantive provisions emanate from European and international patent law initiatives.²⁷ The statutory provisions relating to patentability originate from the 1973 European Patent Convention (hereinafter, ‘EPC’).²⁸ Further, considering the fact that the EPC did not regulate the post-grant process of patents, federal legislators introduced models of the 1975 Luxembourg Convention, popularly known as the 1975 Collective Patent Convention (CPC) with respect to the patent infringement and exceptions.²⁹

British patent law, by virtue of section 130(7) of the UK Patents Act 1977, recognizes the international history of many of its substantive provisions. This section demands that all laws relating to patentability, infringement, and exceptions have to be framed as having, as generally as possible, the same consequences in the UK as the relevant laws of the European Patent Convention, Community Patent Convention and Patent Cooperation Treaty in the territories to which those Conventions relate.

²⁴ *Wilson v. Simpson*, 50 U.S. 109 (1850).

²⁵ Patents Act, 35 U.S.C. § 271 (1953).

²⁶ Alexander J. Mendoza, *Legal and Social Implications of the 3D Printing Revolution*, CMCSTP 31 (2015).

²⁷ Colin Birss et al., *Terrell on the Law of Patents* 12 (19th ed. 2020).

²⁸ *Records of the Luxembourg Conference on the Community patent*, at 332 (Dec. 3, 1975).

²⁹ *Id.*,



Additionally, section 60(1) & (2) of the UK Patents Act 1977 governs direct and indirect patent infringement.³⁰

Further, the UK has expressed its desire to engage in the Unitary Patent Program.³¹ This approach was initiated by most EU Member States and contemplated the creation of a unitary patent right, together with a system of common adjudication, within the participating states. Hence it is conceivable that after review by the European Patent Office, protection by ostensible patents with the unitary effect would be accessible for applicants.³² Such patents would then be mandated by a new court system, namely the Unified Patent Court (UPC),³³ along with the current bundle of patents. The introduction of this program is currently delayed due to a constitutional challenge before the German Federal Constitutional Court³⁴ and the political repercussions of the referendum on leaving the European Union on 23 June 2016, while the UK Government recently ratified the Unified Patent Court Agreement to participate as a non-EU member.³⁵

PEOPLE'S REPUBLIC OF CHINA

The advent of consumer-level 3D printing has given rise to issues at a variety of rates especially, surrounding the intellectual property to protect industrial designs. Admittedly, with China having a reputation for producing and selling counterfeit 3D products³⁶, their issue towards the 3D printing and the threats caused to the owners of well-known designs are extreme.³⁷ If a 3D printer creates a design for a company and then the trademark registered by a third party in the Chinese Trademark Office for that specific or similar product is applied to that product, then infringement of the trademark may occur under Article 52 of Trademark Law of People's Republic of China (hereinafter, 'PRC').³⁸ Moreover, if the label is not registered but is well recognized in China, the act will also be considered a violation of Article 5 of the PRC Law Against Unfair Competition.³⁹ Given the fact that there is no general "fair use" or "private use" protection under the PRC Trademark Act or the PRC Act Against Unfair Competition, and the production of one product in this context would, in principle, suffice to establish an infringement.⁴⁰

³⁰ Patents Act, § 60 (1949).

³¹ Luke McDonagh, *European Patent Litigation in the Shadow of the Unified Patent Court* 80 (2016).

³² *Unitary Patent*, EPO (July 17, 2020, 6:45 PM), <https://www.epo.org/law-practice/unitary/unitary-patent.html>.

³³ Council Agreement on a Unified Patent Court, 2013 O.J. (C 175).

³⁴ Thorsten Bausch, *Breaking News: Germany's Federal Constitutional Court pulls Emergency Break on UPC Agreement*, Kluwer Patent Blog (July 17, 2020, 7:13 PM), http://patentblog.kluweriplaw.com/2017/06/13/breaking-news-germanys-federal-constitutional-court-pulls-emergency-break-upc-agreement/?doing_wp_cron=1595092340.3300731182098388671875.

³⁵ Sam Gyimah, *UK ratifies the Unified Patent Court Agreement*, Gov.UK (July 17, 2020, 10:32 PM), <https://www.gov.uk/government/news/uk-ratifies-the-unified-patent-court-agreement>.

³⁶ Danielle Long, *Is China's counterfeit goods market tarnishing the reputation of its homegrown brands?*, The Drum (July 18, 2020, 11:58 PM), <https://www.thedrum.com/news/2017/04/06/chinas-counterfeit-goods-market-tarnishing-the-reputation-its-homegrown-brands>.

³⁷ Yunguang Long, *3D printing technology and its impact on Chinese manufacturing*, AAMT 1488, 1488 (2017).

³⁸ Patricia Marquez, *Trademark: A Comparative Look at China and the United States*, 14 TILR 334, 352 (2011) [hereinafter *Patricia*].

³⁹ *Id.* at 345.

⁴⁰ *Id.* at 350.



It should also be mentioned that for many years it has been possible to register 3D shapes in relation to trademarks in China. A brief analysis of that respective list shows the registration of a large number of 3D marks.⁴¹ Any unapproved printing of these licensed 3D labels would also constitute an infringement of trademarks within the current Chinese law and policy.⁴² Comparably, if the design is well known in China, such as the design of a Coco-Cola bottle, it may still be protected under the PRC Law Against Unfair Competition even though it has not been licensed in China.

The 3D designs are protected essentially under Article 2 of the PRC Patent Law.⁴³ According to the respective article, the word ‘design’ is referred to as any new design of the shape, structure, or mixture thereof of a product, along with the hybrid of color and shape or pattern of a product which generates an architectural feeling and is suitable for industrial use.⁴⁴ Certainly, any 3D printing of a design which is registered in the Chinese Patent Office as a design patent can encompass a patent infringement.⁴⁵ Nevertheless, there are defenses that can be established under the PRC Patent Law.

Taking this into account, the failure to review design patents before granting them is an advantage to the defendant to question the validity of that respective patent itself by stating that it is not a novel. Further, the patents last only 10 years in PRC and they cannot be renewed,⁴⁶ hence the expiration of the patent can be recognized as a defense. Furthermore, experimental use⁴⁷ can be used as a defense as it is possible in the case of design patents. Although there is no distinction between private and commercial use in PRC, it can still be recognized as a defense and left to the interpretation of the courts.⁴⁸

Under the PRC copyright law, creative works and the 3D depictions are protected. That being said, notwithstanding several well-known cases, such as the Lego case,⁴⁹ it is widely believed that if an artistic work is imposed on an industrial level it will lose copyright protection and have to be protected as a design patent by the PRC Patent Law. The PRC Copyright Law contains a broad range of protections (under Article 22) that may be applicable to a customer using a 3D printer to make a 3D version of an artistic work inclusive of fair use and protections for

⁴¹ Matthew Murphy & Sarah Xuan, *Chinese Intellectual Property Aspects of 3D Printing*, HG.org (July 18, 2020, 2:01 AM), <https://www.hg.org/legal-articles/chinese-intellectual-property-aspects-of-3d-printing-30501> [hereinafter *HG*].

⁴² Jing “Brad” Luo & Shubha Ghosh, *Protection and Enforcement of Well-Known Mark Rights in China: History, Theory and Future*, 7 NJTIP 119, 121 (2009).

⁴³ *HG*, *supra* note 41.

⁴⁴ Geoffrey Lin, *An overview of patentability in China*, Lexology (July 18, 2020, 2:46 AM), <https://www.lexology.com/library/detail.aspx?g=59af8b61-928f-4d15-910c-adb845b83507>.

⁴⁵ *HG*, *supra* note 41.

⁴⁶ *Patents*, China IPR SME Helpdesk (July 18, 2020, 3:42 AM), <https://www.china-iprhelpdesk.eu/content/patentsfaqs>.

⁴⁷ Dr. Li Feng et al., *China: Experimental Use Exemption Of Patent Infringement - A Brief Comparison Of China And The United States*, Mondaq (July 18, 2020, 4:21 AM), <https://www.mondaq.com/china/patent/374754/experimental-use-exemption-of-patent-infringement--a-brief-comparison-of-china-and-the-united-states>.

⁴⁸ Patricia, *supra* note 30.

⁴⁹ Stine Jacobson, *Toymaker Lego wins court case against Chinese copycats*, Reuters (July 18, 2020, 5:01 AM), <https://www.reuters.com/article/us-lego-china-copyright/toymaker-lego-wins-court-case-against-chinese-copycats-idUSKCN1NA2QF>.



private research and analysis.⁵⁰ Such protections will need to be overhauled when 3D printers reach family homes.

CHALLENGES FACED BY THE IP LAW

Despite the fact that India has enacted numerous legislations for the protection of the IP, there are few aspects through which a 3D printer helps the infringer to elude. Further, duplicated copies of an invention using a 3D printer is essentially constituted as a lost sale to the patent proprietor. However, in order to sue for infringement, it is necessary for the patent holder to know that a 3D printer is used by someone to construct a patented invention. Moreover, being aware of such usage is a daunting task as these printers are used widely across the world in different sectors. IP laws are age-old laws that are trying to develop by persuading the judiciary to broader the interpretation with regard to modern technologies. Considering the U.S Patent law, the buyer of the patented invention is entitled to the right to use and repair.⁵¹ Their repair and reconstruction doctrine which allows the consumer to repair a failed or broken component of the invention, aborted to disclose that buyers can replace the needed components easily using a 3D printer. This doctrine is not followed in India, as the third party cannot make or use the invention without the permission of the patentee.⁵²

Further, fixing liability on an infringer is another critical problem. The Indian

Copyright has endured amendments to incorporate Internet Service Provider (ISP) Liability for the purpose of infringements through the internet. However, the introduction of such a notion with technology like additive manufacturing is still uncertain. It is perceivable that the people responsible for the 3D print models will expect no liability for the occurrence of infringements through their database. The Indian Copyright Act has provided Internet Service Provider liability⁵³ under Section 51(a)(ii) and Technology Protection Measures under Section 65A and 65B in order to determine the liability for infringing IP works through the internet.⁵⁴ The main concern with 3D printing is the permissibility of “making” under the Patent law. To understand this concern, the process of additive manufacturing has to be clear. 3D printing technology commences with a digital 3D template or blueprint of a design known as CAD. The CAD files can be created either through scanning of the objects with the help of a 3D scanner or by direct manual drawing on the CAD program. Subsequently, the file transfers its contents to the 3D printer in “layers,” which makes it primed to print. 3D printer discharges material substances starting from the foundation, layer by layer, to create an object upwards. Once the layers are placed accordingly, they are fused together which eventually transforms the object into a solid form.⁵⁵

Future 3D printers seem to have the ability to reproduce themselves or to print an identical

⁵⁰ Seagull Haiyan Song, *Reevaluating Fair Use in China—A Comparative Copyright Analysis of Chinese Fair Use Legislation, The U.S. Fair Use Doctrine, and The European Fair Dealing Model*, 51 IDEA 453, 480 (2011).

⁵¹ *Aro Manufacturing Co. v. Convertible Top Replacement Co.*, 377 U.S. 476 (1964).

⁵² Shamnad Basheer, *‘Exhausting’ Patent Rights in India: Parallel Imports and TRIPS Compliance*, 13 JIPR 486, 494 (2008).

⁵³ The Copyright Act, § 51 (1957).

⁵⁴ The Copyright Act, § 65 (1957).

⁵⁵ Elsa Malaty, *3D Printing and IP Law*, WIPO Magazine (July 18, 2020, 2:52 PM),



printer. 3D printing has the ability to be both impressive and simplifying; from making items as complicated as effective aircraft parts,⁵⁶ advanced prosthetics,⁵⁷ guns,⁵⁸ and lab-developed organs⁵⁹ to things as plain and useful as a plastic replacement character for baby coaches.⁶⁰ The price of replicating items has been reduced, and the method of production has become easier to complete. Business owners and individuals may not need to buy complex machines and appliances or possess exceptional skills for producing goods. The products can be printed based on the 3D models and templates through the 3D printers. The raw materials are the only essential components for printing. As much as 3D printing being an exceptional technological development, it is infringing the rights and privileges of the people exceedingly.

The problem of copyright is indeed similar to that of Napster⁶¹ and the battle between the music industry and peer to peer sharing websites. Nevertheless, the 3D printer adds more to this. It not only makes the files readily accessible for download but additionally, it takes a step forward by printing the potentially copyrighted design. Therefore, if people and organizations are not

diligent, there may be several levels of copyright infringement. Throughout the long run, 3D printing has the potential to absolutely shudder intellectual property to its heart, as it diffuses the factors of production and flouts many of the principles that underpin present IP laws.⁶² It causes a substantial financial loss on IP assets.

CONCLUSION

3D printing is an innovative means of production that will make it easier to copy a patented product and thereby facilitate the infringement of a patent. Considering that the future application of the Patent Act to 3D printing is uncertain and there is a necessity for new regulatory structure.⁶³ The current repair and reconstruction doctrine in the US needs modification. It is recommended that the Supreme Court can follow a reinterpreted standard or set of standards to make the research more accurate, consistent, and predictable for the patent proprietors and the consumers of a 3D printer. When 3D printing technology advances, the traditional patent law between repair and reconstruction needs improvement as well. Keeping in mind the copyright regime, the holder should know the identity

https://www.wipo.int/wipo_magazine/en/2017/01/article_0006.html.

⁵⁶ Laura Griffiths, *How 3D printing is shaping the future of aircraft maintenance, repair & overhaul*, TCT Mag (July 18, 2020, 1:32 PM), <https://www.tctmagazine.com/additive-manufacturing-3d-printing-news/additive-manufacturing-aerospace-maintenance-repair/>.

⁵⁷ *3D Printed Prosthetics | Where We Are Today*, Amputee Coalition (July 18, 2020, 1:45 PM), <https://www.amputee-coalition.org/3d-printed-prosthetics/>.

⁵⁸ Jake Hanrahan, *3D-printed guns are back, and this time they are unstoppable*, Wired (July 18, 2020, 1:59 PM), <https://www.wired.co.uk/article/3d-printed-guns-blueprints>.

⁵⁹ *Inverness girl Hayley Fraser gets 3D-printed hand*, BBC News (July 18, 2020, 3:10 PM), <https://www.bbc.com/news/uk-scotland-highlands-islands-29441115>.

⁶⁰ Christopher Mims, *3D printing will explode in 2014, thanks to the expiration of key patents*, Quartz (July 18, 2020, 3:21 PM), <https://qz.com/106483/3d-printing-will-explode-in-2014-thanks-to-the-expiration-of-key-patents/>.

⁶¹ *A & M Records, Inc. v. Napster Inc.*, 239 F.3d 1004 (2001).

⁶² Charles Finocchiaro, *Personal Factory or Catalyst for Piracy?*, CAELJ 473, 476 (2013).

⁶³ Tabrez Y. Ebrahim, *3D Printing: Digital Infringement & Digital Regulation*, 14 NJTIP 37, 46 (2016).



of the end-user. Therefore, it is pertinent for the courts to clarify the extent of copyright protection provided to the CAD file. However, the court is also expected to make sure that the copyright is not granted to technological progress and solutions. 3D printing is an extraordinary invention. Nevertheless, its threat to the IP laws is extremely high that the infringers of the patents slip away from the legal consequences easily with no regrets.

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