



# Notiziario

dell'Ordine dei Consulenti in Proprietà Industriale

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## Sommario

### In questo numero

— Un saluto (e non un commiato)

— È in arrivo il Patent Box Italiano, un'opportunità offerta alle imprese da valutare attentamente caso per caso

— 3D printing or additive manufacturing technology

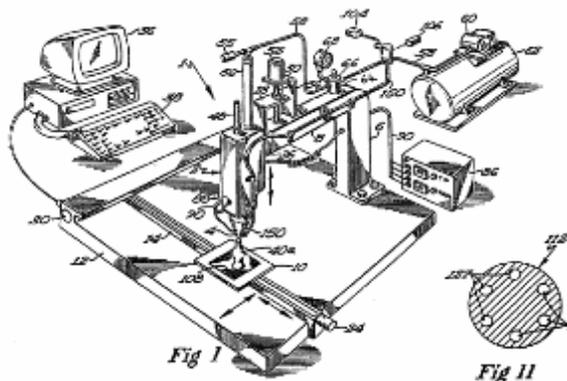
— OMPI - Gruppo di Lavoro per lo Sviluppo Legale del Sistema di Madrid - 13° sessione

## 3D printing or additive manufacturing technology

Technological development gave the beginning to the Copyright law, which was a response to the emergence of the revolutionary invention of the printing machine. The next disruptive technology revolution, ironically arising again from printing technology, namely 3D printing, has the potential to bring a significant toll of consequences on intellectual property. "3D printing is a general-purpose technology that will do for physical objects what MP3 files did for music."<sup>1</sup> The technology, which entails the fall of technical and cost barriers, will make possible copying of a far broader range of products than music and film digitization did. It increases the ease of making counterfeit physical goods and consequently it will likely be a challenge for all areas of intellectual property. "Once in digital form, things become easy to copy. This means protecting intellectual property will be just as hard as it is in other industries that have gone digital."<sup>2</sup>

By the end of the twentieth century digitization and internet revolutionized distribution and ability of reproducing the information and posed heavy challenge for the copyright works such as music and films. Copyright law struggled especially with the fact that new technologies made the copying of music and movies inexpensive and easy, and the enforcement more difficult.

"3D printing is a computer-driven manufacturing technology through which three-dimensional shapes and products can be created through the printing of successive layers of material."<sup>3</sup>



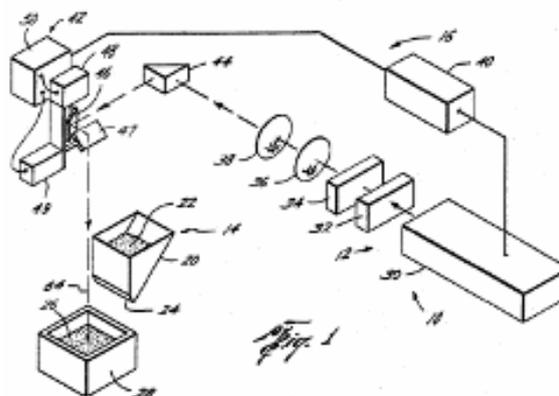
EP0833237 (1989, Stratasys Inc.): patent related to the Additive Manufacturing Tech.

"In theory, nearly any three-dimensional shape can be created in this way. In practice, to give just a few examples, the technology has so far been used to print jewelry, teeth, hearing aids, toys, architectural models and engine parts."<sup>4</sup>

This technology promises a number of advantages: cost and time to market reduction, technical superiority for very complex structures, and increase local production, full customization of produced products. This is the area, where the European Union (EU) is under the pressure of competition from the low cost countries.<sup>5</sup> For all these reasons this technology receives high level of recognition and support from the EU as a vehicle to stimulate European economy innovation in order to retain competitiveness and capitalize on new markets.<sup>6</sup>

It receives also high level of attention in the EU funding through FP7 and H2020 programs<sup>7</sup>. "Only in FP7, the European Commission funded more than 60 successful projects with a total amount of EU contribution of over € 160million and a total budget of € 225million."<sup>8</sup>

While the technology promises that number of advantages, including bringing jobs back to Europe and creating new business opportunities, it brings also its toll of consequences in the legal area, worth mentioning not limited to intellectual property only, but also product liability, health and safety and environmental law.



US4863538 (1986, Univ. of Texas): one of the first patents related to the Selective Laser Melting

1 D.R. Desai, G.N. Magliocca, 'Patents meet Napster: 3D printing and the digitization of things' .p1

2 Barraclough, 'A five-step strategy for the 2D revolution' (November 2011) *Managing Intellectual Property* 24

3 V.Braun, '3D printing', *Computer and Telecommunications Law Review*, (2012) p. 1

4 Braun, p.1

5 'Additive Manufacturing in FP7 and Horizon 2020', p. 1

6 See Commission Website <http://ec.europa.eu/programmes/horizon2020/en/area/key-enabling-technologies>, visited 12.12.2014

7 For the definition of H2020 see: <http://ec.europa.eu/programmes/horizon2020/en/what-horizon-2020>

8 'Additive Manufacturing in FP7 and Horizon 2020', p. 1

Only recently in September 2014 European Commission and the European Parliament hosted 9th European Policy on Intellectual Property (EPIP) Meeting, devoted to the Intellectual Property Implications of 3D printing, particularly the copyright implications arising from the use of 3D printing software and online tools, which was based on the research results carried out for a project commissioned by the UK Intellectual Property Office (UKIPO)<sup>9</sup>. While the world's economies discuss 3D printing in the light of revolutionizing manufacturing system in a global scale, bringing jobs back to the industrialized, developed countries and creating new business and jobs opportunities, the technology has also other dimension. Although the technology is still in its early development phase, as all technology it moves and becomes more accessible and easier in operation. "The promise of 3D printing is that people will be free to make almost anything they want themselves, which opens the door to a new wave of innovation from the home."<sup>10</sup>

The availability of the consumer 3D printers, which can turn homes into small, customized factories at the much reduced cost and significantly lower technical barriers than the manufacturing process as known until recently, will also make it far easier to infringe patents, copyrights, and other intellectual property rights. "Intellectual property intensive industries rely on the prerequisite that an individual or a small business will have the wherewithal to make an infringing item from scratch, but 3D printers will make that much easier."<sup>11</sup> 3D printing is about a "personal manufacturing revolution"<sup>12</sup>. The prices fall and the technology becomes more a consumer, personal product. As it was with computers and internet emergence the same can be now the case with 3D printers.<sup>13</sup> At the time of writing, Amazon offers 3D printers for home use from about 600€ and RepRap<sup>14</sup> offers self-replicating machine. There are also emerging activities of the various

intermediaries, including internet based providing different services related to the 3D printing. In July 2008, a company called Shapeways began providing online 3D printing services to hobbyists, who could submit their CAD files for printing.<sup>15</sup> The company 3D Systems in assistance to its Cube 3D printer offers an online service Cubify that enables to upload and share the designs.<sup>16</sup> Similar facilities for sharing digital designs are provided by Thingiverse<sup>17</sup> and Quirky<sup>18</sup>. Famous from peer-to-peer sharing, Swedish, The Pirate Bay goes the same direction and increasingly host CAD files for objects to be printed at home. "According to The Pirate Bay, the next step in "copying" will be making physical objects from digital files."<sup>19</sup>

The act of sharing CAD files via online platforms may raise the calls for a reconsideration of the existing laws. Internet let people to develop the culture of sharing, what led to illegal downloading on the online platforms. This developments heavily disrupted copyright law on the one hand, on the other hand some argue that the "copyright law turned an entire generation of young people into criminals."<sup>20</sup>

Advocates of 3D printing and accessibility to knowledge and technical advancements warn 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."<sup>21</sup> The evidence of 3D printing impact on intellectual property are the first noted cases in the United States of alleged infringing copyright files uploaded to Thingiverse platform, which resulted in the notice and takedown order based on the US Digital Millennium Copyright Act 1998 (DMCA 1998).<sup>22</sup>

The shift of manufacturing towards being personal and the shift of digitalization towards physical objects as well as emerging changes in the business models as described above bring challenges to the existing

9 See Dinusha Mendis delivers Keynote on 3D Printing and IP Law at the European Parliament <https://microsites.bournemouth.ac.uk/cippm/2014/09/20/dinusha-mendis-speaks-about-3d-printing-and-ip-law-at-the-european-parliament/>, visited 12.12.14

10 Desai, Magliocca, p.2

11 Desai, Magliocca, p.6

12 D. Mendis, 'The clone wars': episode 1 - the rise of 3D printing and its implications for intellectual property law - learning lessons from the past?', *European Intellectual Property Review* (2013) p.5

13 Mendis, p.5

14 See RepRap website <http://reprap.org/>, visited 12.12.14

15 D.Graham-Rowe, '3-D Printing for the Masses', *MIT Technology Review* (31.07. 2008),

<http://www.technologyreview.com/Infotech/21152/?a=f>, visited 12.12.2014

16 see Cubify website <http://cubify.com/Info/FAQ>, visited 12.12.2014

17 see Thingiverse website <http://www.thingiverse.com/>, visited 12.12.2014

18 see Quirky website <https://www.quirky.com/>, visited 12.12.2014

19 K.Scott, 'The Pirate Bay adds 'physibles' 3D-printing category', *WIRED UK* (Jan. 24, 2012),

<http://www.wired.co.uk/news/archive/2012-01/24/pirate-bay-introducesphysibles>, visited 12.12.2014

20 R. Falkvinge, C. Engstrom, 'The Case for Copyright Reform', 2012, p.1

21 M. Weinberg, 'It Will Be Awesome if They Don't Screw it Up: 3D Printing, Intellectual Property, and the Fight Over the Next Great Disruptive Technology', *Public Knowledge* (November 2010)

22 C. Thompson, 'Clive Thompson on 3-D Printing's Legal Morass' *Wired* (05.30.12), <http://www.wired.com/2012/05/3-d-printing-patent-law/>, visited 12.12.2014

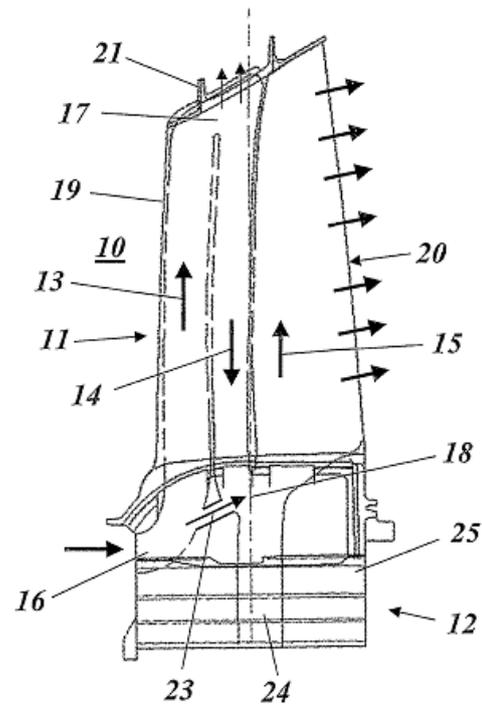
intellectual property law. As Peter Hanna of Ars Technica has noted, “Any technology that allows users to digitize and replicate objects is bound to have some IP implications.”<sup>23</sup> Some commentators ask about another Napster revolution.<sup>24</sup>

First predictions concerning financial impact of the 3D printing on intellectual property are significant, “3D printing will cause the loss of at least \$100 billion per year in intellectual property globally by 2018.”<sup>25</sup>

Still 3D printing has the potential to act as a game changer in the number of industries e.g. machine industry. In this field the main advantage is that will be possible to create components with geometries impossible to be reproduced by traditional machining processes in order to better satisfy technical requirements. For example, geometries of the internal cooling channels of a gas turbine blade, working at more than 1000 degree in operative conditions, increasing the performance and decreasing the service costs along all the life of the turbine.

The importance of such a technology has been recognized also by the European Patent Office, that has recently created the specific Patent Classification B33<sup>26</sup>, related to the “additive manufacturing, i.e. manufacturing of three-dimensional, objects by additive deposition, additive agglomeration or additive layering, e.g. by 3-d printing, stereolithography or selective laser sintering”. This Classification actually includes 1 SubClass and 8 SubGroups and it seems to be still under development. Arcam and United Technologies are the most active Applicants in this field according to the actual B33.

**Joanna Slowik and Simone Billi**



**Fig.1**

EP1709298 (2004): patent related to the internal cooling channels of a gas turbine blade

<sup>23</sup> P. Hanna, ‘The next Napster? Copyright questions as 3D printing comes of age’, ARS TECHNICA (06.04.2011) <http://arstechnica.com/tech-policy/2011/04/the-next-napster-as-3d-printing-comes-of-age>, visited 12.12.2014

<sup>24</sup> See Mendis, p. 6 or Desai Magliocca

<sup>25</sup> J. Fraser, ‘3D Printing Will Cost The World USD100 Billion, Says Study’ Intellectual property watch (19.02.2014) <http://www.ip-watch.org/2014/02/19/3d-printing-will-cost-the-world-100-billion-says-study/>, visited 12.12.2014

<sup>26</sup> <http://www.cooperativepatentclassification.org/CPCRevisions/NoticeOfChanges/MP0121.pdf> visited 02.2015



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