



MCC INTERVIEW: Mark E. Avsec / Benesch

3-D Printing Treads Path of Music Industry

Disruption across sectors spawns multitude of IP issues

Mark E. Avsec is a partner in Benesch's Cleveland office and vice-chair of the Innovations, Information Technology & Intellectual Property (3iP) Practice Group. He's also 3iP group lead – Copyrights and leader of Benesch's 3D Printing Legal Team.

MCC: 3-D printing dates back at least to the 1970s, when engineers commonly referred to it as “rapid prototyping.” Please

tell our readers more about how 3-D printing has evolved. Were the legal, regulatory and business issues we see today emerging even at the beginnings of the industry?

Avsec: The modern Internet was invented in the 1970s and 1980s. The World Wide Web was invented in 1990. Only in the later 1990s did the Internet begin to take off. Similarly, 3-D printing is evolving and has yet to revolutionize the world. It will be a revolution because the technology will renovate and reconstruct the way business is done and products are produced. It will renovate and reconstruct economies. It will affect every business. 3-D printing is any process used to make three-dimensional objects where successive layers of material are laid down under the control of a computer to create the

object. These objects can be of any shape or geometry. They may be produced from a file that is the result of scanning a physical object – or the source may be another digital data source such as a CAD file. A few years ago when I was reading about 3-D printing for the first time, I was blown away, first, that a three-dimensional object could be printed out by a computer. Then when I read that a digital file of that object could be transmitted over the Internet and the recipient could then print off the object – the light bulb immediately went on. This is just like what happened

Mark E. Avsec

Partner in Benesch's Cleveland office and vice-chair of the Innovations, Information Technology & Intellectual Property (3iP) Practice Group
mavsec@beneschlaw.com

in the music industry. I came from the music industry, as some people know, and the similarities are striking. This could be a huge intellectual property problem! This was going to change the world.

MCC: *Most think of 3-D printing as kids and maker enthusiasts sharing a single printer. Can you describe the size and scope of the 3-D printing market today?*

Avsec: This is not just to make tchotchkes. The range of printable materials is expanding. In addition to plastics, they already include ceramics, cement, glass, numerous metals, even electronics and wires. The goal is to print out a fully functioning smartphone in 10 years. I am told printing food was the big draw at the Consumer Electronics Show this year. In 2008 there were 350 different models of 3-D printers. Today there are more than 23,000 models. In 2014, sales of industrial-grade 3-D printers in the U.S. were already one-third the volume of industrial automation and robotic sales. By 2020 that figure will rise to 42 percent. This is going mainstream. Count on it. Gartner analysts predict that by 2018 there will be \$100 billion per year in intellectual property losses as a result of 3-D printing – that is *per year*. Intellectual property is going to be a huge issue, which is why in part we formed an industry group at Benesch to be experts. An apartment building was printed out in China last January, and in Dubai an entire office building was printed. They were printed using very large 3-D printers.

MCC: *Industrial manufacturers such as GE have been widely recognized for their embrace of 3-D printing for prototyping and other uses. What industries have been the early adopters? What are the most common commercial uses, and what legal and regulatory issues are those uses raising?*

Avsec: This is happening right now. GE is using the technology to produce jet engines, medical devices and home appliance parts. Lockheed Martin and Boeing are using 3-D printing for aerospace and defense. Aurora Flight Sciences are using the technology for unmanned aerial vehicles, Invisalign for dental devices,



Disruptive technologies spawn IP issues. We have seen it time and again.

Luxexcel for lenses for LEDs, Google for consumer electronics. Prosthetic limbs are being printed out – hips for hip replacement. Fashion, dresses, shoes, jewelry. Social expression products. Pirate Bay just started trading in a whole new category: PHYSIBLES, i.e., the trading of electronic files for 3-D printing. Isn't this reminiscent of the music industry in the last two decades? Lots of those files traded on Pirate Bay will concern products protected by intellectual property – away from the control of the IP owner. Those are the IP issues. Well, you can see the regulatory issues when people start printing off prosthetic limbs at home. This is not what the FDA planned on. And if they want Superman or RoboCop prosthetics, then there are the IP issues. This is already starting to affect the “spare parts” market.

MCC: *Rapidly evolving technology such as 3-D printing almost always spawns major patent and other IP issues. What impact is 3-D printing having on IP law? The copyright issues must be especially challenging.*

Avsec: Disruptive technologies spawn IP issues. We have seen it time and again as history has unfolded. If a human merely scans an existing utilitarian part, whatever it may be, and it becomes a digital file, that digital file is not likely protected under copyright law. It may be protected by a patent or trade dress. And, to be sure, if digital files of artistic and expressive works are traded online, copyright protection and enforcement mechanisms would be available. So DMCA takedown notices will be an important tool. But copyright

law will not be much help to curb the trading of non-copyrightable, useful parts in the digital ecosystem. So if your business makes money by selling parts that are not protected by a patent or trade dress, you need to pay attention. 3-D technology will dramatically impact the after-market products industry. That's why Caterpillar and other industrial giants are focused on it. Moreover, even as it pertains to patent law, intellectual property strategies – including claiming strategies – will have to change in order to continue the breadth of traditional intellectual property protections. There is a need for new claiming strategies to address the unique nature of 3-D printing. “Beauregard”-type claims in patent prosecution. Claims directed to a 3-D model. Claims directed to a method of scanning an object to create a digital file. We believe this affects trademark prosecution strategies as well.

MCC: *What are some of the contractual issues in this area? How are warranty and supplier agreements being impacted by 3-D printing?*

Avsec: As we learned from the music industry, companies cannot simply resort to litigation and employ defensive strategies. Nobody is going to sue this technology out of existence. Get out in front, employ offensive strategies, leverage the technology. Manufacturers might license 3-D printing files and technical know-how to traditional end users. End users can then economically manufacture devices, replacement parts, etc., as needed without fear of infringing the rights of others. Manufacturers could then generate revenue through licensing fees. Manufacturers of complex and durable machines and systems can offer long-term contracts to supply all replacement parts at economically appealing terms. Manufacturers can include language that voids a warranty if replacement parts are not made to a manufacturer's specifications.

MCC: *The Illinois Institute of Technology has recently warned consumers of health hazards associated with the use of 3-D printers. Can you tell our readers more about the study and if/how it may impact*

the regulation of the commercial and personal use of 3-D printers? What government agencies are focused on 3-D printing?

Avsec: I am not an expert on the harmful effects of 3-D printing at home. I just don't know enough about it. Of course, with the ability of an individual to print anything at home in the future, there are going to be concerns. Because the technology will span all industries, regulatory agencies will be involved and are looking at this. All of them I imagine. We don't want to be flying around in a plane that contains a 3-D printed part from an unknown origin. We are already reading in the paper about working firearms being printed – in libraries. Soon bio-printing will take hold. And pharmaceutical printing. Can you see why this will affect so many regulatory agencies?

MCC: *Do you anticipate policy and other changes to the IP laws as the result of the boom in the 3-D printing market?*

Avsec: This process is green. It uses much less energy when compared to a manufacturing process with a foundry. Constructing a building will save up to 60 percent in construction waste and 50 to 80 percent in labor cost. Will this raise the ire of labor organizations? Probably. In short, 3-D printing will force changes in business models and commercial laws. Unique and complex goods that never existed before will be printed. Local production will

**3-D printing
is at the same
level as when
the Commodore
computer
came out.**

cause disruption to the existing supply chain model, and the need to carry inventories will be reduced. Consequently, logistics companies like Amazon and UPS are thinking about this. UPS, I am told, is installing kiosks for 3-D printing in certain stores. Warehouses designed to contain large inventories may be a thing of the past for certain industries. Businesses will be focused on the needs of the “one consumer” through mass customization. Will there be changes in IP laws? All I can tell you is that the recorded music industry is a completely different industry today. It makes a fraction of the money it did in the '80s when the music industry was in large part selling pieces of plastic to people. But music is vibrant and is still everywhere and is still valued – just as it was in 18th century Bonn and Vienna. It is just no longer so focused on recorded music.

Everything changes. If innovation stops because there is no longer any incentive to innovate because nobody can make money innovating if products are simply knocked

off and printed out – then we will see changes to IP laws and other commercial laws. Just this year, the Copyright Office issued a music licensing study. Copyright law will be retrofitted now to better align with how consumers consume music today. I think the same thing will happen in years to come as a result of 3-D printing.

MCC: *It would seem when a technology such as 3-D printing empowers individuals to do what was once the province of businesses, interesting legal and risk issues arise. Are you seeing that in your practice?*

Avsec: We have already talked about the interesting legal issues that will arise. We are at the same level in 3-D printing right now as when the Commodore 64 computer came out. I know this is a tsunami that will continue coming. We're focused on it. We continue to study it. We're throwing resources behind it. We're counseling our clients on prosecution strategies today. I have museum and library clients who are interested. 3-D printing has loads of terrific application for museums, and I have counseled on these applications. Polymer companies and materials providers see the technology as a boon. We are early in the adaptation process. Remember what Bill Gates said: “We always overestimate the change that will occur in the next two years and underestimate the change that will occur in the next ten. Don't let yourself be lulled into inaction.”