Florida Law Review

Volume 68 | Issue 4 Article 6

July 2016

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THREE-DIMENSIONAL PRINTING AND A LAISSEZ-FAIRE ATTITUDE TOWARDS THE EVOLUTION OF THE PRODUCTS LIABILITY DOCTRINE

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Abstract

This Note presents an analysis of how those engaged in three-dimensional (3D) printing may be treated under the products liability doctrine. While 3D printing has the potential to dramatically change the manufacturing process of nearly every good on the consumer market, the unique manufacturing process alone will not automatically bar recovery for every plaintiff injured by an object manufactured using a 3D printer. Courts have not yet defined the scope of liability for actors engaged in creating objects using 3D printers, but an injured plaintiff will have numerous avenues to recovery thanks to the flexibility of the products liability doctrine. Due to the complexities of this new manufacturing process, a case-by-case analysis is required to determine the extent to which any actor may be strictly liable or negligent. While there may be some short-term gaps in relief, large-scale consumer products companies have and will continue to enter the marketplace and bring with them more traditional manufacturing and distribution processes that courts already understand. Their participation will only increase the chances that a plaintiff will successfully prevail on a theory of strict liability. While some injuries may go uncompensated during this evolution, courts should not rush to expand the doctrine.

* I would like to thank the staff of the *Florida Law Review*, my friends, family, and Amanda Griffin for their support while writing this Note.

INTRODUCTION

Three-dimensional (3D) printing technology has the potential to rapidly change the manufacturing process of almost every product and may convert a significant portion of present day consumers into manufacturers.[1] This result could turn the consumer products industry on its head.[2] Similar to the impact that online shopping has had on brick and mortar retailers, 3D printing could have an even more severe impact on the manufacturing industry as a whole.[3] While 3D printing is not a new

1. *See* Michael Weinberg, *What Lawyers Might Like to Know About 3D Printing and the Law*, 6 NO. 4 LANDSLIDE 42, 44 (2014) ("Regardless of what form it takes, 3D printing will make it much easier for people to make, modify, and distribute physical things.").

2. Adam Ludwig & Sarah Evelyn Harvey, *3d Printing Affects Every Industry, Even Homebuilding*, TECHONOMY (July 19, 2015, 9:51 AM), http://techonomy.com/2013/07/3d-printing-affects-every-industry-even-homebuilding/.

3. Instead of visiting a local store or purchasing an item online, 3D printing could transform the way people procure goods by allowing an individual to simply "print" the good at home using a 3D printer.

technology, it has only recently gained household recognition.[4] Even the President of the United States recently claimed that he believes 3D printing will play a significant role in the future of manufacturing.[5]

The increasing availability of 3D printers is leading to a new category of consumer–manufacturers that will shape the way goods are brought or not brought to market.[6] Using this technology, small businesses and individuals can create any object imaginable for both resale and personal use by simply converting an idea into an electronic computer-aided design (CAD) file or by downloading one of the many files already available online.[7] Through 3D printing, individuals have created products ranging from functioning weapons[8] to motor vehicles.[9] While the technology to produce such items exists, the consumer market for products made using 3D printers has not reached maturation.[10] At least one large-scale consumer products retailer recently recognized the profitability potential of 3D printing and has launched a plan to bring designs and products to market on a massive scale.[11]

The increasing interest in 3D printing and the availability of 3D printers and designs has raised several legal issues.[12] Questions of

4. *See* Lucas S. Osborn, *Regulating Three-Dimensional Printing: The Converging Worlds of Bits and Atoms*, 51 SAN DIEGO L. REV. 553, 560 (2014).

5. *See* Vivek Wadhwa, *Let's Curb Our 3D-Printer Enthusiasm, Folks*, WASH. POST (Aug. 2, 2013), http://www.washingtonpost.com/blogs/innovations/wp/2013/08/02/lets-curb-our-3d-printer-enthusiasm-folks/ ("[T]he President said 3D printing will 'revolutionize the way we make almost everything.'" (quoting Barack Obama, President of the U.S., Address Before a Joint Session of Congress on the State of the Union (Feb. 12, 2013), http://www.presidency.ucsb.edu/ws/?pid=102826)).

6. *See* Ben Depoorter, *Intellectual Property Infringements & 3D Printing: Decentralized Piracy*, 65 HASTINGS L.J. 1483, 1485 (2014).

7. *See* Timothy R. Holbrook & Lucas S. Osborn, *Digital Patent Infringement in an Era of 3D Printing*, 48 U.C. DAVIS L. REV. 1319, 1329 (2015); Steven Kurutz, *A Factory on Your Kitchen Counter*, N.Y. TIMES (Feb. 20, 2013), http://www.nytimes.com/2013/02/21/garden/the-3-d-printer-may-be-the-home-appliance-of-the-future.html.

8. *See* Nick Bilton, *The Rise of 3-D Printed Guns*, N.Y. TIMES (Aug. 13, 2014), http://www.nytimes.com/2014/08/14/fashion/the-rise-of-3-d-printed-guns.html?_r=0.

9. *See* Brian Fung, *So, this Exists: A Working Car Has Been 3D-Printed Out of Carbon Fiber Plastic*, WASH. POST (Sept. 19, 2014), http://www.washingtonpost.com/blogs/the-switch/wp/2014/09/19/so-this-exists-a-working-car-has-been-3d-printed-out-of-carbon-fiber-plastic/.

10. *See* Wadhwa, *supra* note 5.

11. *See* Dominic Basulto, *How 3D Printing Could Transform Amazon and Online Shopping*, WASH. POST (Mar. 13, 2014), http://www.washingtonpost.com/blogs/innovations/wp/2014/03/13/how-3d-printing-could-transform-amazon-and-online-shopping/ ("Theoretically, one day Amazon might just sell the design file for a product, and the consumer would print the design file at home with a 3D printer in the comfort of his or her living room.").

12. *See* Osborn, *supra* note 4, at 569–71.

intellectual property rights[13] and firearm regulations[14] are becoming hot-button issues.[15] In addition, 3D printing presents numerous products liability questions.[16] For example, any object created using a 3D printer could have at least three separate actors[17] who had a significant role in its creation.[18] In this scenario, a separate actor manufactured the printer (Actor One), another created the CAD file that guides the 3D printer in the creation of the object (Actor Two), and then a third brought the object into existence by printing the object (Actor Three) using his 3D printer.[19] If the object proves defective and injures someone, against whom, if anyone, would the victim have a claim?[20] Further, under current law, how successful might the victim be?[21] In answering these questions, Professor Nora Freeman Engstrom suggests that a victim may not have a successful claim against any of the three hypothetical actors.[22] She suggests, however, that "courts may well, in typical common law fashion, end up softening lines and blurring boundaries in order to impose strict liability on hobbyist 3-D inventors and digital designers, especially if uncompensated injuries mount."[23]

13. *See, e.g.*, Depoorter, *supra* note 6, at 1485–86; Davis Doherty, *Downloading Infringement: Patent Law as a Roadblock to the 3D Printing Revolution*, 26 HARV. J.L. & TECH. 353, 358–59 (2012); Holbrook & Osborn, *supra* note 7, at 1321–25; Mark A. Lemley, *IP in a World Without Scarcity*, 90 N.Y.U. L. REV. 460, 462–63 (2015); Preeta Reddy, Note, *The Legal Dimension of 3D Printing: Analyzing Secondary Liability in Additive Layer Manufacturing*, 16 COLUM. SCI. & TECH. L. REV. 222, 230–31 (2014).

14. *See, e.g.*, Bilton, *supra* note 8.

15. *See* Rory K. Little, *Guns Don't Kill People, 3D Printing Does? Why the Technology is a Distraction from Effective Gun Controls*, 65 HASTINGS L.J. 1505, 1508–09 (2014).

16. *See* Nora Freeman Engstrom, *3-D Printing and Product Liability: Identifying the Obstacles*, 162 U. PA. L. REV. ONLINE 35, 36–37 (2013), https://www.pennlawreview.com/online/162-U-Pa-L-Rev-Online-35.pdf; Stephanie Noble, *Researching Emerging Technology*, 42 COLO. LAW. 103, 105 (2013); Osborn, *supra* note 4, at 569–71; Weinberg, *supra* note 1, at 44.

17. For purposes of this Note, I will focus primarily on actors that a have significant role in the manufacturing of the 3D-printed creation. Secondary actors might include suppliers, wholesalers, and distributors. While these secondary actors may also face liability claims, they are not a primary focus of this Note.

18. *See* Weinberg, *supra* note 1, at 44.

19. This model scenario is merely one of many potential production processes available to create products using 3D printers.

20. *See* Engstrom, *supra* note 16, at 37.

21. *Id.*

22. *Id.* at 37–40.

23. *Id.* at 40.

Professor Engstrom's scenario is merely one of the many possible production models[24] for creating an object using a 3D printer.[25] This model may soon be unlikely due to the private sector's recognition of the technology.[26] Individuals and industry increasingly recognize 3D printing's potential, and markets for the sale of 3D printed products and designs are emerging.[27] As big business enters the marketplace, the production models will likely look much more similar to traditional manufacturing models than the three actor hypothetical above.[28]

Not all 3D printing production processes will allow actors to escape liability under the present day understanding of products liability. Courts may want to be cautious in diminishing the doctrine to cover any short-term gaps in relief for fear of approaching an activist's role too closely. The doctrine of strict liability is an equitable theory that allows for great flexibility in its application, thereby offering the courts other options.[29] Therefore, given this great flexibility, further expansions to cover the injuries that may result from products created using 3D printers are not needed.[30]

Product liability disputes within the framework of 3D printing have yet to surface, and no court has been faced with the issue. Given the United States' litigious nature and the growth in popularity of 3D printing, it is only a matter of time before these and other legal issues present for decision. This Note examines the potential liability of the three primary actors in the 3D manufacturing process by applying current products liability law. For each of the three primary actors, this Note provides an analysis of the likelihood of success of a hypothetical plaintiff proving a manufacturing defect, a design defect, and a defendant's failure to provide adequate warnings or instructions.

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24. An object could be brought into existence using 3D printing technology in many other ways than the process Professor Engstrom focuses on. Many of these other processes would allow a plaintiff to bring a successful strict liability claim.

25. *See* Osborn, *supra* note 4, at 555–56.

26. *See* Bilton, *supra* note 8.

27. *See, e.g.*, Basulto, *supra* note 11; John Hornick, Elizabeth Ferrill & Ben Sirolly, *3D Printing Goes Corporate in 2015*, INTELLECTUAL PROPERTY TODAY, Dec. 2014, at 14, http://www.iptoday.com/issues/2014/12/3d-printing-goes-corporate-in-2015.asp.

28. Here, "traditional" is meant to mean a manufacturing process in existence prior to the revolution of 3D printing and which the courts have defined on numerous occasions.

29. *See* David G. Owen, *Bending Nature, Bending Law*, 62 FLA. L. REV. 569, 615 (2010) ("As new technologies are invented and put to use, they will no doubt continue to spew forth rafts of unexpected harms, some quite impossible to imagine. Yet foreseeability's moral grounding and robust flexibility provide the private law with full power to adapt corrective justice to fit novel situations. And, as nature bends, so can private law.").

30. *See id.*

I. POSSIBLE CLAIMS AGAINST ACTOR ONE: THE 3D PRINTER MANUFACTURER

The first actor in any 3D printing production model is the company that manufactured the 3D printer itself.[31] A person injured by a product created using a 3D printer will likely attempt to bring a claim against the printer manufacturer by arguing a theory of strict liability, thereby bypassing the elements of duty and breach that are necessary in a negligence claim.[32] The doctrine of strict liability is premised upon the notion that "by and large producers are better suited than users to make the cost-benefit analysis" of a product.[33]

A. *The 3D Printer Contained a Manufacturing Defect*

A plaintiff may conceivably bring a claim against the printer manufacturer that the printer contained a manufacturing defect.[34] The plaintiff, however, may struggle to persuade a judge to impose strict liability on the printer manufacturer.[35] According to the Third Restatement of Torts, a product is defective due to a manufacturing defect when "at the time of sale or distribution . . . the product departs from its intended design even though all possible care was exercised in the preparation and marketing of the product."[36]

Therefore, unless the printer contains a defect that subsequently causes the printed object to be defective, the printer serves as merely a

31. The printer manufacturer may be the most formal actor in the manufacturing process. In fact, it is entirely possible that the printer manufacturer may be the only actor that is not judgment-proof. However, this dilemma—that injured parties will be unable to recover from only the printer manufacturer—will become rarer as larger-scale businesses enter the 3D printing marketplace.

32. *See* 2 DAN B. DOBBS, THE LAW OF TORTS § 342 (2001).

33. *See* Guido Calabresi & Jon T. Hirschoff, *Toward a Test for Strict Liability in Torts*, 81 YALE L.J. 1055, 1067 (1972) (explaining that generally speaking, the creator of the danger is best suited to make the cost-benefit analysis). *But cf. id.* at 1068 (arguing that in strict products liability, the general assumption that the producer is better able to make the cost-benefit analysis is less applicable).

34. The RESTATEMENT (THIRD) OF TORTS divides products liability into three main categories beginning with the idea that the product contained a manufacturing defect. *See* RESTATEMENT (THIRD) OF TORTS § 2 (AM. LAW INST. 1998).

35. A judge may find that the plaintiff is complaining of a design defect, and that a manufacturing defect analysis is inapplicable. *See* Caterpillar Tractor Co. v. Beck, 593 P.2d 871, 881 (Ala. 1979) (rejecting the use of a manufacturing defect analysis with a design defect claim); Barker v. Lull Eng'g Co., 573 P.2d 443, 454 (Cal. 1978) (defining the approach to analyzing a manufacturing defect versus a design defect claim); Banks v. ICI Americas, Inc., 450 S.E. 2d 671, 673–75 (Ga. 1994) (reversing a lower court that used a manufacturing defect analysis regarding a design defect); Voss v. Black & Decker Mfg. Co., 450 N.E. 2d 204, 207 (N.Y. 1983) (defining an approach to analyzing manufacturing defect versus design defect claim).

36. RESTATEMENT (THIRD) OF TORTS § 2.

tool in the manufacturing process. The plaintiff bringing a manufacturing defect claim against the printer manufacturer faces a major issue: having to show that the printer that he used—and not the object printed—had a defect that caused the injury.[37] It may be more likely that a faulty product created using a 3D printer was defective due to the product's design, the type of plastic used, or an inadequate warning.[38] If so, it would make little sense to hold the printer manufacturer liable unless the manufacturer created the design, distributed the plastic, or failed to adequately warn.[39] Because the printer likely served as a mere tool in creating the printed object,[40] the plaintiff must show that the printer caused the injuries, not the object created by the printer.[41] In most circumstances, the plaintiff's claim will likely arise from an injury caused by a defect in the object created using a 3D printer, and not from an injury caused by the 3D printer itself.[42]

Yet, if a defect in the printer did cause a defect in the object created using the printer, then the manufacturing defect theory against the printer manufacturer might succeed.[43] In this scenario, the printer is still a mere tool in the manufacturing process, and the person who clicked "print" maintains a duty to ensure the tool was in working order and that the final product was safe.[44] For example, someone who used a faulty hammer to build a defective gun could not shield himself from liability by stating: "But for the hammer, the gun would not have been defective." Additionally, the plaintiff may have a difficult time proving whether the product defect was truly caused by a defect within the printer.[45] It may not be entirely clear whether a defect in the printer or the design inputted by the person who actually printed the object caused the product's defect.[46] It is also likely that the design was not created by the same actor

37. *See* Engstrom, *supra* note 16, at 38.

38. This statement excludes the scenario in which a defective printer caused an electrical fire or any similar personal injury-type circumstance.

39. *See generally* Shen Wang, *When Classical Doctrines of Products Liability Encounter 3D Printing: New Challenges in the New Landscape*, 16 HOUS. BUS. & TAX L.J. 104 (2016).

40. In most circumstances, the 3D printer's role in the manufacturing process will likely be no different than a set of wrenches used by a plumber in creating a water piping system.

41. *See* Engstrom, *supra* note 16, at 38.

42. Such as if a 3D-printed toy gun hurt the plaintiff. The injury was caused by the toy, not by direct contact with the printer itself.

43. For example, if a defect within the printer caused a CAD file to not be properly implemented, which in turn caused a printed object to be defective.

44. *See* Wang, *supra* note 39, at 116.

45. *See infra* notes 47–49 and accompanying text.

46. *See* Weinberg, *supra* note 1, at 44.

that manufactured the printer.[47] Discovering when the defect occurred and who created it may prove difficult and costly.[48]

B. *The Printer Manufacturer's Role in the Input Material*

Alternatively, the plaintiff may have another avenue to recovery if the printer manufacturer also marketed, sold, or encouraged a certain input material (ink),[49] and that ink was not compatible with the printer.[50] 3D printers create an object by laying thin layers of ink on top of one another until the design specification is complete.[51] Discrepancies between various qualities and strengths of inks will lead to issues of fitness for the particular creation.[52] The failure of a printer manufacturer or CAD file designer to properly recommend a suitable grade of ink for a particular creation could open the door to liability.[53]

If the printer manufacturer also manufactured or sold the offending ink, it could face a claim that the ink contained a manufacturing or design defect aside from a claim that the printer was defective.[54] Additionally, if the ink manufacturer was a separate entity from the printer manufacturer, then the entity becomes a fourth actor against whom an injured person could bring a claim against.[55] Regardless of who manufactured the ink, it would not necessarily need to be sold in conjunction with the printer.[56]

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47. Since many of the CAD files uploaded onto file sharing databases are created by users and are easily accessible, it is likely that the design being printed will not be one created by the manufacturer. *See* Kurutz, *supra* note 7.

48. The inability to examine a product with the naked eye will require experts in the fields of 3D printing and engineering to determine exactly what caused the defect. While the cost of their opinions may prevent some from filing suit, the burden of discovering the cause of a defect in a 3D-printed object will not be significantly higher than hiring an expert in any other products liability case. *See* Preeta Reddy, *Analyzing Secondary Liability in Additive Layer Manufacturing*, 16 COLUM. SCI. & TECH. L. REV. 222, 232 (2014).

49. *See* Matt Petronzio, *How 3D Printing Actually Works,* MASHABLE (Mar. 28, 2013), http://mashable.com/2013/03/28/3d-printing-explained/.

50. *See* RESTATEMENT (THIRD) OF TORTS: PROD. LIAB. § 2 (AM. LAW INST. 1998). Here, exposure to liability will depend on the role of the printer manufacturer. If the manufacturer also distributed or manufactured the ink, it may be liable for a manufacturing or design defect claim. Conversely, if the manufacturer of printer recommended a certain brand or grade of ink, it may be liable for a failure to provide adequate warnings or instructions claim.

51. *See* Petronzio, *supra* note 49; Neil Savage, *Engineers Invent Inks for Making 3-D Printed Fuel Cells*, IEE SPECTRUM (Dec. 5, 2014 5:00 PM), http://spectrum.ieee.org/energywise/green-tech/fuel-cells/engineers-invent-inks-for-making-3d-printed-fuel-cells.

52. *See id.*

53. In addition, this argument is stronger if the printer, design, and ink were sold as a kit.

54. *See* RESTATEMENT (THIRD) OF TORTS: PROD. LIAB. § 2.

55. Wang, *supra* note 39, at 111–12.

56. For example, assume an individual bought a kit to build a classic car. Regardless of whether the manufacturer of the kit or another actor supplied the metal needed to build the car,

Printer manufacturers surely have a duty to recommend a certain ink for use with their printers.[57] This recommendation should also include detailed descriptions on how to properly load and use the ink with their printer.[58] Failure to properly instruct a consumer on what type of ink is suitable for her printer would result in another potential avenue for a plaintiff to hold either actor strictly liable for her injuries.[59]

C. *The 3D Printer Contained a Design Defect*

If a plaintiff could not succeed on a manufacturing defect theory against the printer manufacturer, the plaintiff might argue that the manufacturer should still be liable for a design defect.[60] Strict liability can attach in a design defect case, [61] but it may be difficult to persuade the court in the 3D printing context. According to the Third Restatement of Torts, a product is defective in design

> when the foreseeable risks of harm posed by the product could have been reduced or avoided by the adoption of a reasonable alternative design by the seller or other distributor, or a predecessor in the commercial chain of distribution, and the omission of the alternative design renders the product not reasonably safe.[62]

Here, the plaintiff faces many of the same hurdles he encountered when claiming a manufacturing defect.[63] Often, the printer manufacturer will not be the same actor who designed the object printed.[64] The printer manufacturer would only be liable for a design defect if the printer caused the plaintiff's injury or if the printer's defective design caused the defect

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the manufacturer of the metal has a duty to ensure its product does not contain a manufacturing or design defect aside from any duty of the kit manufacturer.

57. For example, 3D printer manufacturer Stratasys recommends certain materials for use with their printers. *Materials*, STRATASYS, http://www.stratasys.com/materials (last visited Oct. 25. 2016).

58. *See, e.g.*, *Loading and Unloading 3D Ink*, M3D, https://printm3d.com/solutions/article.php?id=47 (last visited Oct. 25, 2016)

59. Continuing with the classic car kit example, the manufacturer of the kit and the manufacturer of the metal both have a duty to provide adequate warnings. In addition, both actors would also have a duty to instruct the consumer as to what type of metal to use or what the capabilities of its metal are.

60. *See* RESTATEMENT (THIRD) OF TORTS: PROD. LIAB. § 2 cmt. i.; Dix. W. Noel, *Manufacturer's Negligence of Design or Directions for Use of a Product*, 71 YALE L.J. 816, 816–19 (1962).

61. *See* RESTATEMENT (THIRD) OF TORTS: PROD. LIAB. § 2 cmt. a.

62. *Id.* § 2.

63. *See* discussion *supra* Section I.A.

64. *See* Engstrom, *supra* note 16, at 37.

in the object.[65] The manufacturer would not be liable if the injury occurred due to a defect in the printed creation.

D. *The Printer Manufacturer Failed to Warn or Adequately Instruct*

The plaintiff's final claim against the printer manufacturer is to argue that the manufacturer failed to provide adequate instructions or warnings for the safe operation of the printer.[66] According to the Third Restatement on Torts,

> [a] product . . . is defective because of inadequate instructions or warnings when the foreseeable risks of harm posed by the product could have been reduced or avoided by the provision of reasonable instructions or warnings by the seller or other distributor, or a predecessor in the commercial chain of distribution, and the omission of the instructions or warnings renders the product not reasonably safe.[67]

As 3D printers become more commonplace, an argument that it is reasonably foreseeable that users will create hazardous[68] products may become more persuasive.[69] However, it is tenuous for a court to hold that the printer manufacturer could create a reasonable instruction or warning that would cover the nearly infinite number of creations conceivable using the technology.[70] The plaintiff may, however, have a strong claim using an inadequate warning theory if the printer manufacturer did not

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65. For example, imagine an oven that does not evenly heat a turkey. The defectively designed oven subsequently caused the turkey to be unsafe for consumption. Additionally, assume the entity that sold the turkey prescribed a proper cooking temperature and cook time. Further, assume the consumer properly followed these instructions. Thus, the turkey would not be unsafe, but for the defectively designed oven.

66. *See* RESTATEMENT (THIRD) OF TORTS: PROD. LIAB. § 2 cmt. i.; A.D. Twerski et al., *The Use and Abuse of Warnings in Products Liability—Design Defect Litigation Comes of Age*, 61 CORNELL L. REV. 495, 500–01 (1976).

67. RESTATEMENT (THIRD) OF TORTS: PROD. LIAB. § 2.

68. MacPherson v. Buick Motor Co., 217 N.Y. 382, 395 (1916) (noting that "[t]he more probable the danger, the greater the need of caution").

69. *See* Sandra L. Gravanti, *Tobacco Litigation: United States Versus Big Tobacco-An Unfiltered Attack on the Industry*, 52 FLA. L. REV. 671, 674 (2000) (stating that "the only requisite showing . . . [of] proof [was] that a reasonable manufacturer would have warned [consumers] of those risks which it should have known of at the time the [products] were sold.").

70. However, the challenge is largely due only to the fact that this duty would be an issue of first impression for the court. Courts are experienced in inadequate warnings and instructions cases and the issue may prove negligible. *But see* Deven R. Desai & Gerard N. Magliocca, *Patents, Meet Napster: 3D Printing and the Digitization of Things*, 102 GEO. L.J. 1691, 1703 n.58 (2014) ("Settled principles in product liability law on warnings will be forced to bend when it comes to 3D printing. Just because anyone can be a manufacturer or a designer does not mean that they should be required to add a warning to their goods or software the way that a firm would.").

provide guidance on the type of ink needed to create products using their printers.[71]

In addition, if the printer manufacturer also sold designs or kits in a bundle with the printer to make certain products in conjunction with its printers, the likelihood of recovery would increase.[72] The unique 3D printing manufacturing process will not shield every printer manufacturer from liability as some have suggested.[73]

E. *Summary of the Arguments Against Actor One*

An injured plaintiff likely has five potential claims against the 3D printer manufacturer, of which four may impose strict liability. The first of these four is a claim that the 3D printer contained a manufacturing defect.[74] The most likely situation in which a court would agree with this claim is if the printer contained a defect that subsequently caused a final product to be defective even though both the CAD file and conduct by the person who clicked "print" were satisfactory.[75]

Second, even if a manufacturing defect in the printer did not subsequently cause the defect in the final product, the plaintiff might still hold the printer manufacturer strictly liable by proving the printer contained a design defect.[76] 3D printing is not a new technology, and a plaintiff might persuade the court that a reasonable alternative design could have been chosen that would not have rendered the final product defective.[77]

The third possible cause of action may represent the plaintiff's best chance to hold the printer manufacturer strictly liable. The plaintiff may have a strong argument to hold the printer manufacturer strictly liable if the printer manufacturer's failure to warn or adequately instruct directly

71. *See* RESTATEMENT (THIRD) OF TORTS: PROD. LIAB. § 2 cmt. i.; Twerski et al., *supra* note 66, at 498.

72. *See* Wang, *supra* note 39, at 106–07 (discussing the potential liability of a printer manufacturer who also sells designs or kits). In this circumstance, the printer manufacturer would be more analogous to a traditional manufacturer.

73. *See* Engstrom, *supra* note 16, at 37.

74. *See* Caterpillar Tractor Co. v. Beck, 593 P.2d 871, 881 (Ala. 1979); Barker v. Lull Eng'g Co., 573 P.2d 443, 454 (Cal. 1978); Banks v. ICI Americas, Inc., 450 S.E.2d 671, 673 (Ga. 1994); Voss v. Black & Decker Mfg. Co., 450 N.E.2d 204, 207 (N.Y. 1983); RESTATEMENT (THIRD) OF TORTS: PROD. LIAB. § 2 cmt. a. (AM. LAW INST. 1998).

75. *See* Engstrom, *supra* note 16, at 38.

76. *See* RESTATEMENT (THIRD) OF TORTS: PROD. LIAB. § 2 cmt. i. (AM. LAW INST. 1998); *see, e.g.*, Noel, *supra* note 60.

77. *See* RESTATEMENT (THIRD) OF TORTS: PROD. LIAB. § 2 cmt. b.; Twerski et al., *supra* note 66, at 503–04.

resulted in the final product's defect.[78] Additionally, this claim would be stronger still if the printer manufacturer also provided the ink or failed to adequately provide the person who clicked "print" with instructions regarding the type of ink to use.[79]

Finally, even if one of these four claims did not persuade the court, the injured could establish the printer manufacturer's liability through a negligence claim.[80] There is no question that the printer is a "product"[81] and no question whether the printer manufacturer is a "commercial seller or other distributor."[82] The only instance in which the printer manufacturer may escape any liability is if the printer was only a mere tool in the manufacturing process. Any judicial action imposing liability on the manufacturer of a non-defective tool would be an unwise expansion of the products liability doctrine.

II. POSSIBLE CLAIMS AGAINST ACTOR TWO: THE DESIGNER OF THE CAD FILE

Once someone has purchased a 3D printer, he will then need a design before 3D objects can be created using his new printer.[83] 3D printers require CAD files to function.[84] The owner of the 3D printer can acquire these files in several ways, including purchasing a printer that includes sample CAD files, creating his own, purchasing them, or downloading them freely from the Internet.[85] Regardless of the way in which the person who clicks "print" acquires the CAD file, the printed object may injure a third party. The injured will likely attempt to sue the designer of the CAD file, but will they have any recourse?

If the owner of a 3D printer creates his own design, the owner essentially becomes the actual manufacturer of the printed object, as discussed below.[86] Instead, imagine the owner of a 3D printer buys or

78. *See* RESTATEMENT (THIRD) OF TORTS: PROD. LIAB. § 2 cmt. i.; Twerski et al., *supra* note 66, at 507, 514.

79. *See* RESTATEMENT (THIRD) OF TORTS: PROD. LIAB. § 2 cmt. i.; Twerski et al., *supra* note 66, at 507, 514.

80. *See* Calabresi & Hirschoff, *supra* note 33, at 1056–57.

81. RESTATEMENT (THIRD) OF TORTS: PROD. LIAB. § 19 ("A product is tangible personal property distributed commercially for use or consumption.").

82. *Id.* § 1; *see* Smith v. Stewart, 667 P.2d 358, 361 (Kan. 1983) (finding that strict liability did not apply to a casual seller that is not in the business of selling a particular item); Elley v. Stephens, 760 P.2d 768, 771–72 (Nev. 1988) (finding that occasional sellers, unlike retailers or manufacturers, are not subject to strict liability).

83. *See* Petronzio, *supra* note 49. Without a design, the printer cannot function. *See id.*

84. *Id.*

85. *Id.*

86. *See infra* notes 185–96 and accompanying text.

downloads for free a CAD file created by another.[87] Think of the CAD file designer as an architect who drew up plans for a home. The person who clicks "print" is the general contractor, and the contractor needs the architect's plans to build the home.[88] Neither is mutually exclusive and both rely on one another.[89]

A. *Is a 3D Printing Design a Product?*

The first issue for the plaintiff would be proving that the CAD file was a "product."[90] The Third Restatement of Torts states that "[a] product is tangible personal property distributed commercially for use or consumption."[91] In addition, "[s]ervices, even when provided commercially, are not products."[92] The Restatement sharply distinguishes between products and services.[93] However, not all commentators agree with this premise.[94] In addition, the fact that CAD files contain intangible information may not shield the designer from strict liability.[95] If the CAD file was specifically intended for mass use, courts may hold the designers

87. Here, an assumption has been made that the person who posted the CAD file online for download is also the same person that actually created the CAD file. If this assumption is not true, then there is yet another actor in the chain of distribution that may be liable to a third party injured by a product created using a 3D printer.

88. *See* Charles W. Finocchiaro, *Personal Factory or Catalyst for Piracy? The Hype, Hysteria, and Hard Realities of Consumer 3-D Printing*, 31 CARDOZO ARTS & ENT. L.J. 473, 477 (2013) (discussing how designers use CAD/CAM software to create digital blueprints. The person clicking print then uses those digital blueprints to create the final product on the 3D printer).

89. *Id.* (discussing how the digital blueprints created by the designer are required for creation of the final product by the 3D printer).

90. *See* Osborn, *supra* note 4, at 568.

91. RESTATEMENT (THIRD) OF TORTS: PROD. LIAB. § 19 cmt. f. (AM. LAW INST. 1998); *see, e.g.*, Saddler v. Alaska Marine Lines, Inc., 856 P.2d 784, 787 (Ala. 1993); Micciche v. E. Elevator Co., 645 A.2d 278, 279 (Pa. Super. Ct. 1994).

92. RESTATEMENT (THIRD) OF TORTS: PROD. LIAB. § 19.

93. *Id.*

94. *See, e.g.*, David W. Lannetti, *Toward a Revised Definition of "Product" Under the Restatement (Third) of Torts: Products Liability*, 55 BUS. LAW. 799, 834 (2000) ("Current strict products liability doctrine is premised on the fallacious assumption that everything can be categorized as either a product or a service. Unfortunately, computer software—and, inevitably, other products that will emerge as technology continues to advance—does not fit neatly within such a monochromatic scale of measurement." (footnote omitted)); Lars Noah, *Authors, Publishers, and Products Liability: Remedies for Defective Information in Books*, 77 OR. L. REV. 1195, 1206–08 (1998) (opining that the distinction makes "little sense"); Frances E. Zollers et al., *No More Soft Landings for Software: Liability for Defects in an Industry that Has Come of Age*, 21 SANTA CLARA COMPUT. & HIGH TECH. L.J. 745, 746 (2005) ("[T]he software industry is no longer in its infancy. Its development has moved out of garages and into corporate offices. It has matured to become a dominant sector of the economy. Consequently, it is appropriate to consider liability for defective software.").

95. *See* Noah, *supra* note 94, at 1206–08.

strictly liable because it was foreseeable that the consumer would rely upon the intangible information.[96] Because designers have greater control and information in creating the CAD file, they are better positioned than consumers to bear the burden of spreading the costs of subsequent injuries.[97]

1. Comparing a CAD File to Software

In 1991, the U.S. Court of Appeals for the Ninth Circuit alluded to the fact that computer software may qualify as a product.[98] While many courts have subsequently held that computer software is a "product," a CAD file is not the same as computer software.[99] Many software programs are mass-marketed and go through many levels of testing.[100] In contrast, freely downloadable CAD files are created by an individual and posted online with no direct marketing[101] and minimal testing.[102] However, this paradigm is likely to evolve as more individuals invest in 3D printers and businesses recognize the potential profits related to the sale of designs for 3D printing. As larger companies enter the marketplace and their designs become more popular, there is a strong argument that they should assume a greater burden to ensure the safety of their products.[103]

In addition, like the designers of computer software, CAD designers face great difficulty in forecasting the almost limitless technical issues that may occur once consumers put their designs to use.[104] Most software companies release their software understanding that numerous technical issues, unforeseen during the design stage, will arise.[105] Unlike CAD designers, software companies can typically correct these mistakes by releasing software updates and, often, the injured suffers nothing more

96. *Id.* at 1207–08.

97. *Id.* at 1209.

98. *See* Winter v. G.P. Putnam's Sons, 938 F.2d 1033, 1036 (9th Cir. 1991) (holding that ideas and expressions in a book are not products, but that computer software may be analogous to aeronautical charts, which other courts have held to be products).

99. *See* Engstrom, *supra* note 16, at 38–39.

100. *See* Zollers et al., *supra* note 94, at 768–70.

101. However, if the designer's intention was to direct traffic to himself and then charge for subsequent designs, then this would be a form of marketing more similar to promotion of software. *See* Lucas S. Osborn, *Regulating Three-Dimensional Printing: The Converging Worlds of Bits and Atoms*, 51 San Diego L. Rev. 553, 572 (2014).

102. An individual who makes their CAD file available for free likely has not put their design through the same rigorous testing that a mass produced software program has endured before going to market.

103. *See* Noah, *supra* note 94, at 1209.

104. *See* Zollers et al., *supra* note 94, at 768–70.

105. *Id.*

than a mere annoyance or financial loss.[106] Conversely, a defective CAD file used to create a tangible product is more likely to cause physical injury rather than an annoyance or financial loss.[107]

2. What if a CAD File is not a Product?

A court might hold that the creation of a CAD file constitutes a service and that a CAD file is not a "product." Courts have treated plans and designs created by architects and engineers this way.[108] If a court held that the creation of a CAD file was more of a service than a product, then the designer might not be held strictly liable. Rather, the court may require the plaintiff to proceed under a negligence standard.[109]

B. *Characterization of a CAD File Defect*

Even if a court held that a CAD file was a "product," the injured party would still have to overcome numerous other hurdles before surviving summary judgment. A manufacturing defect theory of products liability would probably fail because a defective CAD file likely is not a manufacturing defect unless an accidental coding error[110] caused a defect in the printed creation.[111] A defective CAD file is more likely to be caused by a design defect because the "product" does exactly what the defective design specified.[112] The issue the plaintiff must prove is not that this one "product" had a manufacturing defect different from all others, but that this design is improper, and a more reasonable and safer alternative design should have been employed.[113]

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106. Defective software could surely cause physical injury to a user or third party, but this statement is meant to be taken generally and not to cover every conceivable instance of injury.

107. *See supra* note 42 and accompanying text (toy gun example).

108. *See, e.g.*, La Rossa v. Sci. Design Co., 402 F.2d 937, 942–43 (3d Cir. 1968) (deciding not to hold an engineer strictly liable because "professional services form a marked contrast to consumer products cases"); K-Mart Corp. v. Midcon Realty Group of Conn., Ltd., 489 F. Supp. 813, 819 (D. Conn. 1980) (declining to hold an architect strictly liable for the failed design of a store, but stating that K-Mart was "not without a remedy for any negligence in the architect's design, for this decision in no way affects the viability of the negligence claim"); Stuart v. Crestview Mut. Water Co., 34 Cal. App. 3d 802, 811 (Cal. Ct. App. 1973) (holding that engineers preform a professional service that is very different than that of a manufacturer).

109. *See, e.g.*, Audlane Lumber & Builders Supply v. D.E. Britt Assocs., 168 So. 2d 333, 335 (Fla. Dist. Ct. App. 1964).

110. *See* F. Patrick Hubbard, *"Sophisticated Robots": Balancing Liability, Regulation, and Innovation*, 66 FLA. L. REV. 1803, 1854 (2014) (noting that it may "be better to treat coding as a design defect, rather than a manufacturing defect").

111. *See* Zollers, *supra* note 94, at 778–79.

112. *Id.* at 778.

113. *See* RESTATEMENT (THIRD) OF TORTS: PROD. LIAB. § 2 (AM. LAW INST. 1998); Voss v. Black & Decker Mfg., 450 N.E.2d 204, 208 (N.Y. 1983) (stating that "[t]he plaintiff, of course, is under an obligation to present evidence that the product, as designed, was not reasonably safe

To illustrate this point, imagine a small town gunsmith downloads a design to build a firearm using a 3D printer. The gun functions properly, but the design included no safety mechanism to ensure that the gun would not discharge unless intended. Guns have been the focus of products liability litigation for many years,[114] and it is standard for gun manufacturers to include safety mechanisms.[115] A design that calls for a safety mechanism is surely a reasonable alternative to one that does not, and courts should not have much difficulty imposing a similar burden on the gunsmith, despite his use of a 3D printer. But, if the court considers the creation of a CAD file a service instead of a product, the injured party may be forced to try a theory of negligence.[116]

Hypothetically, assume the court decides that the CAD file was a "product" and contained a manufacturing defect.[117] The plaintiff still has another hurdle to overcome before the court holds the designer of the CAD file strictly liable. The plaintiff must show that the CAD designer was a "commercial seller or distributor."[118] This requirement would likely eliminate one group of CAD designers automatically.[119] The designer who uploaded his or her design to the internet for anyone to freely download, use, share, distribute, or modify may escape the imposition of strict liability because of the "commercial seller or other distributor" requirement.[120]

Even if the designer charges for his or her design, he or she may still not be a commercial seller or distributor.[121] However, the more a designer

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because there was a substantial likelihood of harm and it was feasible to design the product in a safer manner").

114. *See, e.g.*, Stephen P. Halbrook, *Suing the Firearms Industry: A Case for Federal Reform?*, 7 CHAP. L. REV. 11, 11 (2004).

115. *See generally Design Safety Standards*, LAW CTR. TO PREVENT GUN VIOLENCE, http://smartgunlaws.org/gun-laws/policy-areas/consumer-child-safety/design-safety-standards/ (last visited Nov. 1, 2016).

116. *See supra* note 113.

117. As previously stated, it is important to remember that a CAD file with a manufacturing defect is going to be a situation in which the actual file had a coding error that rendered the CAD file product unsafe. If the final product was properly printed to the specifications of the CAD file, but the product was still unsafe, then this would be a design defect.

118. RESTATEMENT (THIRD) OF TORTS: PROD. LIAB. § 1; *see, e.g.*, Elley v. Stephens, 760 P.2d 768, 771 (Nev. 1988) (holding strict liability theory is not applicable to an occasional seller of a product, who does not, in the regular course of their business, sell such a product); Smith v. Stewart, 667 P.2d 358, 361 (Kan. 1983) (holding there was no cause of action for breach of implied warranty, in part, because the seller did not meet the definition of a merchant).

119. Unless a strong argument could be made that the designer was actually receiving a benefit other than financial compensation, such as a boost to his or her reputation, or the likelihood of subsequent sales based on an initial freebee.

120. *See* Osborn, *supra* note 4, at 570.

121. *See* Engstrom, *supra* note 16, at 39–40.

engages in commerce related to the sale of his designs, the more willing a court will be to hold the designer strictly liable as a commercial seller or other distributor.[122] Relevant factors in determining whether a designer is a "commercial seller or distributor" might include: whether the designer engaged in advertising the CAD files, the amount of downloads, the number of CAD files this designer has created, the complexity of the designs, and the nature of the designs.[123]

Regardless of the challenges described above, the designer of the CAD file might defend the claim by showing that the plaintiff did not implement the design as intended or modified the design.[124] Modification may not be an issue in every circumstance, but as more printer and ink manufacturers enter the marketplace, the production models will increase in complexity and require a heightened attention to detail.[125] It may prove difficult for a plaintiff to recover from the CAD file designer, but as CAD designers offer more standardized designs for money on a larger scale and market their designs more aggressively, the tide should turn.[126]

C. *Failure to Warn or Adequately Instruct*

Finally, the plaintiff might also have a strong case that the designer should be strictly liable if the designer failed to adequately warn or instruct on the use of her CAD file. The designer is likely in the best position to offer guidance on how the CAD file should be implemented by the consumer.[127] The warning or instruction should encompass many factors such as what type of 3D printer to use, what grade of ink is proper, the intended use of the final product, and the foreseeable hazards associated with the reasonable use of the creation. Because the final product is a plastic object and the most common designs will likely be similar to products already in existence, the designer will not have a significantly heightened burden to warn or instruct about the use of the

122. *Id.*

123. *See* Escola v. Coca Cola Bottling Co. of Fresno, 150 P.2d 436, 440 (Cal. Ct. App. 1944) (Traynor, J., concurring) (stating that "a manufacturer incurs an absolute liability when an article that he has placed on the market, knowing that it is to be used without inspection, proves to have a defect that causes injury to human beings" (citing MacPherson v. Buick Motor Co., 217 N.Y. 382 (1916)).

124. *See* Zollers, *supra* note 94, at 779.

125. These issues might include: size, scale, grade of ink, and practical applications of the creation. *See* Wang, *supra* note 39, at 117.

126. If so, courts may hold that CAD designers should be treated like other commercial sellers and other distributors.

127. *See* Wang, *supra* note 39, at 121 ("[I]t is always beneficial for the designers of the state-of-the-art products to add instructions or warnings, or even disclaimers before releasing the CAD file."). In this instance, the consumer is the person who purchased or downloaded the CAD file to subsequently print an object using a 3D printer.

product, as compared to any other individual engaged in manufacturing products using more traditional means.

D. *Summary of the Arguments Against Actor Two*

An injured plaintiff likely has four potential claims against the designer of the CAD file, three of which have the potential for the plaintiff to succeed on a theory of strict liability. First, the plaintiff may prove the CAD file contained a manufacturing defect if an accidental coding error resulted in a defect in the final product.[128] Second, the plaintiff may convince the court that the CAD file design contained a design defect.[129] Because the vast majority of products created using 3D printers should likely be common items that can also be manufactured using traditional means, the plaintiff should not have great difficulty introducing a reasonable alternative design that would not have resulted in the defect of the object printed.[130] Finally, the plaintiff might also hold the CAD file designer strictly liable for failing to adequately warn or instruct.[131] The CAD file designer surely has a duty to provide the end consumer with proper warnings and instructions especially regarding the recommended ink grade and compatibility with commonly available 3D printers.[132]

The plaintiff's biggest challenges will be convincing the court that a CAD file is a product[133] and that the designer of the CAD file is a commercial seller or distributor.[134] However, deciding that a CAD file is a product is not likely a stretch. Courts have held that software can be defined as a product and it does not seem improbable to extend their

128. *See* RESTATEMENT (THIRD) OF TORTS: PROD. LIAB. § 2(a) (AM. LAW INST. 1998); Hubbard, *supra* note 110, at 1854.

129. *See* RESTATEMENT (THIRD) OF TORTS: PROD. LIAB. § 2(b); Voss v. Black & Decker Mfg., 450 N.E.2d 204, 208 (N.Y. 1983) ("The plaintiff, of course, is under an obligation to present evidence that the product, as designed, was not reasonably safe because there was a substantial likelihood of harm and it was feasible to design the product in a safer manner.").

130. *See* RESTATEMENT (THIRD) OF TORTS: PROD. LIAB. § 2 cmt. f.; Twerski, *supra* note 66, at 500.

131. RESTATEMENT (THIRD) OF TORTS: PROD. LIAB. § 2 cmt. i.

132. *See* Neil Savage, *Engineers Invent Inks for Making 3-D Printed Fuel Cells*, IEE SPECTRUM (Dec. 5, 2014, 5:00 PM), http://spectrum.ieee.org/energywise/green-tech/fuel-cells/engineers-invent-inks-for-making-3d-printed-fuel-cells.

133. *See* Engstrom, *supra* note 16, at 38.

134. *See* RESTATEMENT (THIRD) OF TORTS: PROD. LIAB. § 1 cmt. c; Smith v. Stewart, 667 P.2d 358, 361 (Kan. 1983) (holding there was no cause of action for breach of implied warranty, in part, because the seller did not meet the definition of a merchant); Elley v. Stephens, 760 P.2d 768, 771 (Nev. 1988) (holding strict liability theory is not applicable to an occasional seller of a product, who does not, in the regular course of their business, sell such a product).

reasoning to CAD files.[135] Finally, while a court may not consider some CAD file designers to be considered commercial sellers or distributors if they receive no benefit from distributing their CAD files, the number of designers that will profit from distributing their files is increasing. The increasing interest and profitability of 3D printing will most likely ensure that the vast majority of CAD file designers behave in ways that fit within the "commercial seller or distributor" requirements.[136]

The only way for the courts to increase the chance that CAD file designers will be strictly liable for injuries that result from the use of their designs would be to abandon the "commercial seller or distributor" requirements that manufacturers and society understand. However, policy dictates that such a decision would not be wise to cover the injuries of an already small and decreasing subset of the industry. In addition, the subset that may escape strict liability may still be liable under a negligence standard.[137]

III. POSSIBLE CLAIMS AGAINST ACTOR THREE: THE PERSON WHO CLICKS "PRINT"

The final actor in the 3D printing production model is the person who clicks "print."[138] Assume the injured party is someone other than the person who printed the object.[139] The plaintiff's action against the person who clicked "print" yields the best chance of recovery because the person who clicked "print" is the truest[140] *manufacturer* of the object created. However, often, the person who clicked "print" may be judgment-proof.[141] This Note discusses the actor who made the tool (the printer

135. *See, e.g.*, Winter v. G.P. Putnam's Sons, 938 F.2d 1033, 1036 (9th Cir. 1991) (holding that ideas and expressions in a book are not products, but that computer software may be analogous to aeronautical charts which have been considered products by other courts).

136. *See* Escola v. Coca Cola Bottling Co., 150 P.2d 436, 440 (Cal. Ct. App. 1944) (Traynor, J., concurring).

137. *See* RESTATEMENT (THIRD) OF TORTS: PROD. LIAB. § 1 cmt. c (noting that "American courts universally hold that only sellers who are in the business of selling products are strictly liable. Thus, noncommercial sellers of products are liable only if shown to have been negligent").

138. The actor could be the owner or user of a 3D printer, for example. *See* Elizabeth J. Kennedy & Andrea Giampetro-Meyer, *Gearing Up for the Next Industrial Revolution: 3D Printing, Home-Based Factories, and Modes of Social Control*, 46 LOY. U. CHI. L.J. 955, 956–58 (2015).

139. If the person who clicked "print" is also the individual who was injured by the final product, the individual would only be able to bring a claim against the various other actors. Here, this Note examines the liability of the person who clicked "print." Thus, it is necessary to assume the injured is someone other than the person who clicked "print."

140. Here, "truest" is intended to mean the actor most analogous to others that have been held as manufacturers in the products liability context.

141. An individual who is judgment-proof is one who has inadequate assets or insurance to cover the costs of another's injuries. *Judgment-proof*, BLACK'S LAW DICTIONARY (10th ed. 2014).

manufacturer), the actor who supplied the ink, and the actor who created the design (the designer of the CAD file), but no actor literally *manufactured* the item that hurts our hypothetical plaintiff. While this may be the plaintiff's best claim, his recovery may still depend on what the creator does with the product once it is printed.[142]

A. *The Printed Creation Contained a Manufacturing Defect*

The plaintiff's first inclination might be to claim that the printed object contained a manufacturing defect, and the person who clicked "print" should be held strictly liable for the defect. The plaintiff must show that the creation was "at the time of sale or distribution,. . . . [a] product . . . contain[ing] a manufacturing defect [because it] depart[ed] from its intended design even though all possible care was exercised in the preparation and marketing of the product."[143] The plaintiff will have the burden of showing that the printed item contained some sort of physical flaw, damage, or was incorrectly assembled.[144] If the item was the only one of its kind that the person who clicked "print" created, the plaintiff may have a difficult time proving a manufacturing defect.[145] A manufacturing defect only occurs when the individual item deviates from the intended design.[146] Without another unit of the product with which to compare the injuring product, it may be difficult for the plaintiff to show how the allegedly defective creation differed from the intended design.[147] In this scenario, the plaintiff would have only the CAD file to compare to the creation that caused their injury.[148]

B. *The "Commercial Seller or Other Distributor" Challenge*

In addition, the plaintiff will have another hurdle to recovery. To hold the person who printed the object strictly liable, the plaintiff must prove the person who clicked "print" was a "commercial seller or other distributor."[149] A "commercial seller or other distributor" is "[o]ne engaged in the business of selling or otherwise distributing products who

142. Similar to the designer of the CAD file, the person who clicked "print" will likely need to be considered a "commercial seller or other distributor" for the plaintiff to succeed on a claim of strict liability. *See* Wang, *supra* note 39, at 116–18.

143. RESTATEMENT (THIRD) OF TORTS: PROD. LIAB. § 2 (AM. LAW INST. 1998).

144. *See id.* at § 2 cmt. a; Caterpillar Tractor Co. v. Beck, 593 P.2d 871, 881 (Ala. 1979); Barker v. Lull Eng'g Co., 573 P.2d 443, 454 (Cal. 1978); Banks v. ICI Americas, Inc., 450 S.E.2d 671, 673 (Ga. 1994); Voss v. Black & Decker Mfg. Co., 450 N.E.2d 204, 207 (N.Y. 1983).

145. *See* Joachim Zekoll, *Liability for Defective Products and Services*, 50 AM. J. COMP. L. 121, 123–27 (2002).

146. *Id.*

147. *Id.*

148. *See* Osborn, *supra* note 4, at 569.

149. *Id.*

sells or distributes a defective product."[150] The person who printed the object must have, at a minimum, sold or distributed the object commercially.[151] Those who give away their creations with no commercial intent may escape strict liability, unless the plaintiff can show that the person who printed the object received another benefit such as improving their reputation for the sale of subsequent designs.[152] The problem of meeting the "commercial seller or other distributor" requirement is particularly troublesome in the 3D printing paradigm because the process significantly lowers the cost of manufacturing and has led to an open-source marketplace.[153]

Even if the creator sells the product, this may not be enough for a court to hold that the creator was a "commercial seller or other distributor" based on a single isolated sale.[154] Unless the person who prints the object regularly manufacturers and sells these products, the court may hold that they are only an occasional seller and not a "commercial seller or other distributor."[155] This issue will raise another question for the court because the benefit of 3D printing is that one can manufacture anything imaginable that can be translated into a CAD design file.[156]

Does the person who prints the object need to sell 3D printed creations generally or must they be in the business of selling this single type of object manufactured using a 3D printer?[157] The answer will lie in whether the court decides the individual is a casual seller.[158] Casual sellers are typically insulated from strict liability because many of the public policy considerations for holding an actor strictly liable are not present.[159] However, the manufacturer of a good is not a casual seller merely because

150. *See* RESTATEMENT (THIRD) OF TORTS: PROD. LIAB. § 1 cmt. c (AM. LAW INST. 1998); *see, e.g.*, Smith v. Stewart, 667 P.2d 358, 361 (Kan. 1983); Elley v. Stephens, 760 P.2d 768, 771 (Nev. 1988).

151. *See* Zekoll, *supra* note 145, at 125–26.

152. *See* Osborn, *supra* note 4, at 569.

153. *Id.*

154. *See* Donald M. Zupanec, *When Is Person "Engaged in Business" for Purposes of Doctrine of Strict Tort Liability*, 99 A.L.R. 3D 671, 671 (1980).

155. *See* Engstrom, *supra* note 16, at 39.

156. *Id.* at 41.

157. RESTATEMENT (THIRD) OF TORTS: PROD. LIAB. § 1 cmt. c (AM. LAW INST. 1998) (stating that "[t]he commercial seller must be in the business not only of selling products, but selling products of the type that harmed the plaintiff"); *see, e.g.*, Santiago v. E.W. Bliss Division, 492 A.2d 1089, 1098–99 (N.J. Super. Ct. App. Div. 1985); Counts v. MK-Ferguson Co., 680 F. Supp. 1343, 1347 (E.D. Mo. 1988); Johnson v. Supro Corp., 498 So. 2d 528, 528–29 (Fla. Dist. Ct. App. 1986).

158. *See* Sprung v. MTR Ravensburg, Inc., 788 N.E.2d 620, 623–24 (N.Y. 2003) (holding that a custom floor fabricator was not a casual seller).

159. RESTATEMENT (THIRD) OF TORTS: PROD. LIAB. § 1 cmt. c; *see, e.g.*, Smith v. Stewart, 667 P.2d 358, 361 (Kan. 1983); Elley v. Stephens, 760 P.2d 768, 771–72 (Nev. 1988).

the item was the only one produced.[160] If the seller manufactures the product to suit the customer's specific needs, the seller may not qualify as a casual seller and may be strictly liable for the injuries caused by a defect.[161] However, this customization requirement may limit recovery to only the plaintiffs that specifically contract with the seller to have a one-of-a-kind object produced.

The commercial seller burden in part relies on the notion that "large producers are better suited than users to make the cost-benefit analysis" to ensure safety[162] and to promote societal interests.[163] Others have argued for a lesser standard for "those who place defective products in the stream of commerce [because they] are morally responsible for any injuries caused by those products."[164] While 3D printing has been a small subset of modern manufacturing, it will undoubtedly become more commonplace in the coming years.[165] The "commercial seller or other distributor" hindrance to recovery may not continue as big-box retailers and online powerhouses recognize the efficiencies and limitless design possibilities that are possible thanks to 3D printing.[166]

For the smaller manufacturers that remain, Professor Nicole D. Berkowitz has recently offered a new affirmative defense theory so they may avoid strict liability.[167] According to her analysis, small-scale 3D printing manufacturers "unlike their commercial counterparts . . . lack leverage over their buyers in price and warranty negotiations. . . . As a result, the strict product theory of liability is too burdensome."[168] To combat this dilemma, she urges courts to afford these manufacturers a "micro-seller" affirmative defense.[169] If granted, the courts would consider factors like "(1) the seller's experience in manufacturing, selling, or designing products, (2) the scale of the seller's business in units and dollars, (3) the seller's ability to spread costs or buy insurance, (4)

160. *See Sprung*, 788 N.E.2d at 623.

161. *Id.*

162. Calabresi & Hirschoff, *supra* note 33, at 1067; *see also* Greenman v. Yuba Power Prods., Inc., 377 P.2d 897, 901 (Cal. 1962) (arguing that the purpose of strict liability is to insure that the costs of injuries are better borne on the manufacturer than on the injured).

163. *See* Benjamin H. Barton, *Tort Reform, Innovation, and Playground Design*, 58 FLA. L. REV. 265, 289 (2006).

164. Lannetti, *supra* note 94, at 826.

165. *See* Dominic Basulto, *How 3D Printing Could Transform Amazon and Online Shopping*, WASH. POST (Mar. 13, 2014), http://www.washingtonpost.com/blogs/innovations/wp/2014/03/13/how-3d-printing-could-transform-amazon-and-online-shopping/.

166. *Id.*

167. *See* Nicole D. Berkowitz, *Strict Liability for Individuals? The Impact of 3-D Printing on Products Liability Law*, 92 WASH. L. REV. 1019, 1049 (2015).

168. *Id.* at 1052.

169. *Id.*

the societal desirability of the specific product at issue, and (5) the seller's good faith."[170]

While these factors are important when considering the imposition of strict liability on the actor, the actor should not be required to plead them as an affirmative defense.[171] Instead, the court should weigh them as part of determining whether the actor was a "commercial seller or other distributor."[172] By offering this analysis as an affirmative defense, Professor Berkowitz may actually increase the likelihood of the actor being held strictly liable by shifting the burden of showing that an essential element of strict liability manufacturing defect, that the defendant is a "commercial seller or other distributor," from the plaintiff.

An injured plaintiff should not be required to meet the threshold of strict liability in every case.[173] Because of the potential difficulties in proving that the product contained a manufacturing defect, and that the person who printed the product was a "commercial seller or other distributor," the plaintiff may be forced to establish negligence.[174] Alternatively, the plaintiff may still succeed on a theory of strict liability by alleging a design defect or failure to warn by the person who clicked "print."[175]

C. *The Printed Creation Contained a Design Defect*

If the plaintiff brought an action alleging a defect in the design of the product made using the 3D printer, the associated issue of who created the design will surface. The best possible scenario for the plaintiff is if the person who printed the object also created the CAD file.[176] The plaintiff must show that the product was

> defective in design [because] the foreseeable risks of harm posed by the product could have been reduced or avoided by the adoption of a reasonable alternative design by the seller or other distributor, or a predecessor in the commercial chain

170. *Id.* at 1049.

171. *Id.*

172. RESTATEMENT (THIRD) OF TORTS: PROD. LIAB. § 1 cmt. c (AM. LAW INST. 1998); *see, e.g.*, Smith v. Stewart, 667 P.2d 358, 360–61 (Kan. 1983); Elley v. Stephens, 760 P.2d 768, 771–72 (Nev. 1988).

173. Such a determination can only be made on a case-by-case basis. There are many possible production models including some that are very similar to traditional manufacturing processes in which actors have been held strictly liable for the injuries that arose out of the use of their products.

174. *See* RESTATEMENT (THIRD) OF TORTS: PROD. LIAB. § 1 cmt. c ("American courts universally hold that only sellers who are in the business of selling products are strictly liable. Thus, noncommercial sellers of products are liable only if shown to have been negligent.").

175. *Id.* at cmt. a.

176. *See* Osborn, *supra* note 4, at 570.

> of distribution, and the omission of the alternative design renders the product not reasonably safe.[177]

Here, the issue will be whether the person who clicked "print" could have chosen a more reasonable alternative design. Because the item is not likely a groundbreaking, new invention, and many designs will likely be available, the actor has made a conscious choice to choose this particular, defective design. If another reasonable alternative design existed for the same product, then the injured plaintiff may have a strong claim that the design was defective.

D. *The Person Who Clicked "Print" Failed to Adequately Warn or Instruct*

Finally, the plaintiff could also allege the person who printed the object failed to warn or instruct because

> the foreseeable risks of harm posed by the product could have been reduced or avoided by the provision of reasonable instructions or warnings by the seller or other distributor, or a predecessor in the commercial chain of distribution, and the omission of the instructions or warnings renders the product not reasonably safe.[178]

However, 3D printing technology allows a user to create anything he can imagine and convert into a CAD file.[179] In addition, the technology is becoming more mainstream and a generation that grew up with computers is taking its place in the marketplace.[180]

Imagine that the object created was a toy gun. Children's toys have been around for decades, and courts are familiar with products liability claims arising from commonly manufactured items. In addition, standardized instructions for an item such as this exist and are readily available.[181] That this toy gun was manufactured using a 3D printer should not diminish the duty of the person who clicked "print" to provide the end user with reasonable instructions and warnings. The burden on the actor to provide adequate instructions and warnings is no greater than

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177. RESTATEMENT (THIRD) OF TORTS: PROD. LIAB. § 2.

178. *Id.*

179. *See* Engstrom, *supra* note 16, at 36; Heidi Nielson, *Manufacturing Consumer Protection for 3-D Printed Products*, 57 ARIZ. L. REV. 609, 611 (2015).

180. *See, e.g.*, Daniel S. Hamermesh, *3-D Printing Will Be a Manufacturing Engine for the Economy*, N.Y. TIMES (Aug. 12, 2014), http://www.nytimes.com/roomfordebate/2014/08/11/will-3-d-printers-change-the-world/3-d-printing-will-be-a-manufacturing-engine-for-the-economy-20.

181. *See Toy Safety*, U.S. CONSUMER PROD. SAFETY COMM'N, http://www.cpsc.gov/en/Business--Manufacturing/Business-Education/Toy-Safety (last visited Nov. 2, 2016).

any other traditional manufacturer, and the fact that the object was created using a 3D printer may be irrelevant.[182] Arguing that the person who printed the product failed to adequately warn or instruct may be the plaintiff's best avenue for recovery.

E. *State-of-the-Art Defense*

However, the defendant who printed the 3D object may have a strong claim to argue a state-of-the-art defense.[183] A state-of-the-art defense exculpates a manufacturer from liability for a design defect if it can show "that the product design conform[ed] to industry custom, that it reflect[ed] the safest and most advanced technology developed and in commercial use, or that it reflect[ed] technology at the cutting edge of scientific knowledge."[184] 3D-printed objects differ only in their printing process, and the common 3D printer owner is likely not printing groundbreaking inventions that the world has never seen or does not understand.

F. *Summary of the Arguments Against Actor Three*

An injured plaintiff likely has four potential claims against the person who clicked "print."[185] In addition, three have the potential for the plaintiff to succeed on a theory of strict liability.[186] First, because the person who clicked "print" is the truest manufacturer of the creation that hurt the plaintiff, he is the actor most inclined to be held strictly liable for a manufacturing defect.[187] If something went wrong during the manufacturing process, and the final product departed from its intended design and subsequently caused the plaintiff's injury, then the plaintiff would have a strong claim to hold the person who clicked "print" strictly liable.[188]

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182. Put simply, a plastic toy is a plastic toy regardless of whether it is made using a 3D printer or using traditional manufacturing techniques. *See* Wang, *supra* note 39, at 120–21.

183. *See* RESTATEMENT (THIRD) OF TORTS: PROD. LIAB. § 2 cmt. IV.B; Elliott v. Brunswick Corp., 903 F.2d 1505, 1508–09 (11th Cir. 1990) (applying Alabama law); Beech v. Outboard Marine Corp., 584 So. 2d 447, 450 (Ala. 1991).

184. RESTATEMENT (THIRD) OF TORTS: PROD. LIAB. § 2.

185. *See supra* Sections III.A–D.

186. *Id.*

187. *See* RESTATEMENT (THIRD) OF TORTS: PROD. LIAB. § 2 cmt. a.; Caterpillar Tractor Co. v. Beck, 593 P.2d 871, 881 (Alaska 1979); Barker v. Lull Eng'g Co., 573 P.2d 443, 454 (Cal. 1978); Banks v. ICI Ams., Inc., 450 S.E.2d 671, 673 (Ga. 1994); Voss v. Black & Decker Mfg. Co., 450 N.E.2d 204, 207 (N.Y. 1983).

188. *See supra* note 187 and accompanying text.

Second, a court might hold the person who clicked "print" strictly liable due to a design defect in the printed creation.[189] If the person who clicked "print" also created the CAD file, this analysis would not be difficult. In addition, even if the person who clicked "print" used another's design to print the object, they would still retain a duty to ensure that the design was proper. Because the vast majority of products created will likely be for common items and many CAD file variations will exist, the person who clicked "print" will also share the duty to ensure that a more reasonable alternative design did not exist that would not have resulted in the plaintiff's injury.[190] Moreover, the person who clicked "print" would have a duty to ensure the grade of ink was proper for the foreseeable use of the product.[191]

Finally, the plaintiff would also have a strong claim to hold the person who clicked "print" strictly liable if the actor failed to warn or adequately instruct the end user.[192] Again, because it is probable that the printed object is not a groundbreaking new invention, the person who clicked "print" has a duty to warn and instruct similar to any other manufacturer that produced a similar item using more traditional production means.[193]

The only hindrance the plaintiff may face is showing that the person who clicked "print" was a "commercial seller or other distributor."[194] While some actors will not be considered "commercial sellers or other distributors" if the individual receives no financial benefit from the sale of the creation or a limited one, others will be. In addition, the increasing interest and profitability of 3D printing will most likely increase the actors that behave in ways that fit within the "commercial seller or other distributor" requirements.[195]

The only way for the courts to increase the probability of the actor who clicked "print" being held strictly liable for injuries that result from their creations would be to abandon the "commercial seller or other distributor" requirements that manufacturers and society understand. Such a decision would not be wise to cover the injuries of an already small and decreasing subset of the industry. In addition, the subset that

189. *See* RESTATEMENT (THIRD) OF TORTS: PROD. LIAB. § 2 (b); *Voss*, 450 N.E.2d at 208 (noting that "[t]he plaintiff, of course, is under an obligation to present evidence that the product, as designed, was not reasonably safe because there was a substantial likelihood of harm and it was feasible to design the product in a safer manner").

190. *See supra* note 189 and accompanying text.

191. *Id.*

192. *See* RESTATEMENT (THIRD) OF TORTS: PROD. LIAB. § 2 cmt. i.; Twerski, *supra* note 66, at 506.

193. *See supra* notes 178–82 and accompanying text.

194. *See* RESTATEMENT (THIRD) OF TORTS: PROD. LIAB. § 1 cmt. c.

195. Escola v. Coca Cola Bottling Co., 150 P.2d 436, 440 (Cal. Ct. App. 1944) (Traynor, J., concurring).

may escape strict liability may still be liable under a negligence standard.[196]

THE FUTURE OF 3D PRINTING PRODUCTS LIABILITY AND FINAL REMARKS

While the complexities of this new manufacturing process are revolutionary from a technical prospective, the flexibility of the products liability doctrine, coupled with the extensive experience the judiciary possesses in this arena, will probably not inhibit recovery for the great majority of plaintiffs hurt by the creations of objects brought into existence by 3D printers. This Note largely focuses on the potential liability of merely three actors that participated in creating an object using a 3D printer. However, as the private sector realizes the potential profitability of the technology, many more actors will enter the equation. These actors will include ink manufacturers, wholesalers, retailers, and distributors.[197] An individual who suffers an injury due to a defect in an object created using a 3D printer may have more potential avenues to recovery than an individual hurt by a product created using more traditional manufacturing processes.[198]

However, for many of the reasons stated above, courts may not be as quick to hold some of the actors engaged in the 3D printing manufacturing process strictly liable as some may desire. As injuries mount, regulatory agencies and state legislatures might feel the pressure to act absent the courts. In addition, governmental involvement may also be influenced for other reasons. If 3D printing really catches on and takes a bite out of traditional manufacturers' pockets, lobbyists on behalf of traditional manufacturers will likely attempt to persuade legislatures to take a tougher stance towards regulating the 3D printing industry. Even without the lobbyists, the shift may prove enticing for a legislator to place his or her name on a bill as the first to attempt to protect their constituents from the hazards of this new industry.

As discussed, the most likely actors to escape liability in the 3D printing manufacturing process will be those smaller businesses, those who engage in smaller batched creations, and those designers who allow access to their CAD files for no cost. If regulations are imposed on the 3D printing industry, it will be exactly these actors who will feel the

196. *See* RESTATEMENT (THIRD) OF TORTS: PROD. LIAB. § 1 cmt. c.

197. *See, e.g.*, Oser v. Wal-Mart Stores, Inc., 951 F. Supp. 115, 118 (S.D. Tex. 1996); Smith v. Fiat-Roosevelt Motors, Inc., 556 F.2d 728, 730 (5th Cir. 1977); Vandermark v. Ford Motor Co., 391 P.2d 168, 171–72 (Cal. 1964).

198. *See* RESTATEMENT (THIRD) OF TORTS: PROD. LIAB. § 1 cmt. e. (recognizing that "any seller in the chain of distribution (manufacturer, wholesaler, retailer) is liable for the sale of a defective product that was a cause of the plaintiff's injury"). Thus, the more actors in the equation, the more "seller[s] in the chain of distribution" to hold liable.

greatest regulatory burden and they may be forced out of the market due to increased costs of operation and regulatory compliance. However, those larger companies that are more likely to be held strictly liable will be in a better position to overcome the costs associated with the increased regulation.

Objects created using 3D printers are made out of plastic, and it is likely that the vast majority will be products that society already understands because the products have also been created using traditional manufacturing processes and have been the subject of prior products liability litigation. In addition, many of the defects will be similar to those of like products produced using traditional manufacturing processes. Often, courts will have existing precedent to rely on. Not all 3D printing production processes will allow actors to escape liability under the present day understanding of products liability and courts may want to be cautious in diminishing the doctrine to cover any short-term gaps in coverage for fear of approaching an activist's role too closely. Historically, equitable remedies have been available only when other legal remedies are inadequate. Since numerous other remedies are available and likely to be adequate, there is no need to expand the equitable notions of products liability. Thus, given this great flexibility, further expansions to cover the injuries that may result from products created using 3D printers are simply not needed.