
PRINTING A WAR IN THREE DIMENSIONS: EXPANDING “ARTICLE” TO INCLUDE ELECTRONIC TRANSMISSIONS BEFORE THE ITC

Daniel T. Kane[±]

Illegal file sharing for three-dimensional printing will be an aerial assault on an already shaken institution, leaving patent law as deeply scarred and infirm as copyright following the Napster¹ wars. In the early 2000s, the ability to easily download and share compressed music and audio files online led to fundamental changes in copyright utilization, enforcement, and policy.² Digital technology, including Napster, allowed for instantaneous, unlimited, and free distribution of audio, text, and video files. Such technologies deprived copyright owners of equivalent revenue from tangible content.³ Similar fundamental shifts will occur in patent law if analysts’ predictions regarding three-dimensional printing come true.⁴ With the minimization and diversification⁵ of

[±] Daniel T. Kane is a J.D. Candidate at The Catholic University of America, Columbus School of Law. The author would like to thank Professor Elizabeth Winston, Associate Professor of Law, Columbus School of Law, and Patrick A. Mulloy, former five two-year term Commissioner, U.S.-China Economic and Security Review Commission, for their advice, guidance, and support in writing this article. The author would also like to thank his friends and family for their support throughout law school.

¹ “Napster was ‘a [peer-to-peer music sharing network] that would allow computer users to swap files with one another directly, without going through a centralized file server or middleman.’” Raymond Shih Ray Ku, *The Creative Destruction Of Copyright: Napster And The New Economics Of Digital Technology*, 69 U. CHI. L. REV. 263, 263, 264 n.4 (2002) (citing Karl T. Greenfeld, *Meet the Napster*, TIME 60 (Oct. 2, 2002)).

² Matthew Green, *Napster Opens Pandora’s Box: Examining How File-Sharing Services Threaten the Enforcement of Copyright on the Internet*, 63 OHIO ST. L.J. 799, 799 (2002); see Ray Ku, *supra* note 1, at 264-65, 320.

³ Ray Ku, *supra* note 1, at 263-64.

⁴ See Ashlee Kieler, *3D Printers: Should They Be in Every Consumer’s Home?*, CONSUMERIST (Jan. 6, 2015), <http://consumerist.com/2015/01/06/3d-printers-should-they-be-in-every-consumers-home/> (quoting Jeni Howard, MarketBot Director of Public Relations, on the future of 3D printing); see also Ray Ku, *supra* note 1, at 264 (“Digital technology therefore has ‘the potential to demolish a careful balancing of public good and private interest

three-dimensional printing,⁶ analysts predict that in the future, individuals will print consumer products using household 3D printers, rather than shipping items across state lines or international borders.⁷ Despite the economic potential, patent holders are fearful of increasing electronic distribution of digital renderings to buyers because of the scars borne by copyright holders.⁸ However, patent law will endure by creating defenses to the impending blitzkrieg.

Federal courts have been the usual battlefield for intellectual property holders fighting off infringers, but they are not the hill from which domestic industries can protect themselves. Section 337 of the 1974 Tariff Act provides intellectual property holders with an additional, administrative weapon against international infringers importing goods into the United States.⁹ Generally, Section 337 protects domestic industries from any form of unfair competition but has predominantly been an arrow in the quiver of mostly intellectual property holders.¹⁰

The United States International Trade Commission (“ITC”) was created to adjudicate cases involving unfair competition under Section 337, including importation – by land or by sea – of articles that infringe domestic intellectual property rights.¹¹ Traditionally, the equitable remedies of Section 337 have been enforced against tangible products infringing valid and enforceable patents, trademarks, copyrights, and other intellectual property rights conveyed by the United States.¹² United States Customs and Border Protection (CBP)

that has emerged from the evolution of U.S. intellectual property law over the past 200 years.”).

⁵ See, e.g., Timothy Lavin, *3D Printing*, BLOOMBERG QUICKTAKE (Oct. 2, 2014, 6:05 PM), <http://www.bloombergtake.com/quicktake/3-d-printing> (describing product examples such as guns, houses, prosthetics, living tissue, phone cases, spare parts, and engine components).

⁶ See Kieler, *supra* note 4 (“The 3D printing industry today is the computer industry of the 1980’s.”).

⁷ See *id.*; Ray Ku, *supra* note 1, at 271

Unlike the manufacturing of bottles or books, copying digital information is both inexpensive and simple. Reduced to ones and zeros, information can be copied by any home computer and stored on the hard drive or a CD in minutes or seconds...Combined with the Internet, digital reproduction makes it possible for every home computer to make and distribute perfect copies worldwide at billions of bits per second.

Id.

⁸ See, e.g., Ray Ku, *supra* note 1, at 274 (“Napster’s potential for distributing music and the reduced costs of copying represent the dark side of digital technology.”).

⁹ JOHN H. JACKSON ET AL., *LEGAL PROBLEMS OF INTERNATIONAL ECONOMIC REGULATIONS* 951 (4th ed. 2002).

¹⁰ *Id.* at 951-52.

¹¹ See *About the USITC*, U.S. INT’L TRADE COMMISSION, http://www.usitc.gov/press_room/about_usitc.htm (last visited Jan. 21, 2015).

¹² Gary M. Hnath, *General Exclusion Orders under Section 337*, 25 *NW. J. INT’L L. & BUS.* 349, 350 (2005).

have been the soldiers on the front lines, seizing and withholding infringing goods that attempt to enter domestic markets through ports or across international borders.¹³ However, electronic transmission of infringing digital data into domestic markets via the Internet requires new methods of enforcement against unfair competition.¹⁴ Just as a saber-wielding cavalry would fend off B-52 Bombers, the Information Age has left CBP grasping at air.

“To be prepared for war is one of the most effectual means of preserving peace,”¹⁵ including peace for intellectual property holders. While preventative measures can be taken administratively, legislatively, and judicially, each potential solution is contingent on the statutory construction of the term “article.”¹⁶ As is commonly the case, the term “article” is statutorily undefined, and leaves interested parties to determine whether allegedly-infringing imports fall within the ITC’s jurisdiction.¹⁷ This Comment contends that the term “article” under Section 337 must be proactively defined as inclusive of intangible goods, including digital renderings, in response to the significant risks of patent infringement arising from advancements in three-dimensional printing technology.

Part I of this Comment provides background information on the United States International Trade Commission and Section 337 of the 1974 Tariff Act. Part I also provides an explanation of three-dimensional printing technology, its development, and the rising threat of infringing importation through illegal file sharing. Part II provides the legal landscape behind the term “article” under Section 337, describing the current interpretations through a recent case before the International Trade Commission. Part III provides a statutory interpretation of the term “article” through the lens of United States patent law, specifically infringement and patent eligibility, and articulates the boundaries of ITC protections around both tangible and intangible goods. Part IV urges the United States to preemptively act through administrative, legislative, and judicial means to ensure continued protection of intellectual property rights in the In-

¹³ *Id.*

¹⁴ *See* Ray Ku, *supra* note 1, at 271

Digital information can be conveyed without the need for a bottle . . . [as] digital information can be transmitted through the radio waves of the electromagnetic spectrum, as electrical impulses through telephone and cable wires, and as light across fiber optic networks with the information alone traveling to the recipient.

Id.

¹⁵ GEORGE WASHINGTON, *State of the Union Address George Washington January 8, 1790*, in STATE OF THE UNION ADDRESSES BY GEORGE WASHINGTON 1, 4 (Jim Mannis, ed. 2003-04), *available at* <http://www2.hn.psu.edu/faculty/jmanis/poldocs/uspressu/SUaddressGWashington.pdf> (last visited Jan. 21, 2015).

¹⁶ *See* 19 U.S.C. § 1335 (2012) (statutory authorization for administrative rules).

¹⁷ *See id.* §§ 1337(a)(4), (m) (noting “article,” missing from statutory definitions).

formation Age. Part V summarizes this article's analysis and re-articulates its recommendations.

I. THE BACKDROP OF CONFLICT

A. United States International Trade Commission

The United States International Trade Commission ("ITC" or "Commission") is a federal administrative agency independently tasked with the investigation and adjudication of international trade disputes concerning unfair trade practices.¹⁸ The ITC's authority creates a "rules-based international trade system."¹⁹ Under the 1974 Tariff Act, the ITC has the specific authority to intervene in disputes involving domestic intellectual property rights (i.e. patent, copyright, trademark, trade secret, etc.) and allegedly infringing imported goods.²⁰ Since the Commission began adjudicating international patent disputes in the mid-1970s,²¹ the agency has prevented various spurious goods from entering domestic markets, ranging from simple toys and pianos to overtly complex semiconductors and video game devices.²² However, not every dispute warrants the Commission's intervention, including when relief is not in the nation's interest.²³

1. Domestic Industry Requirement

Owners of intellectual property rights are afforded the ITC's protections only if they can first establish a domestic industry pertaining to their intellectual property exists, or is in the process of being established, within the United States.²⁴ Similar to the standing requirements under federal law, the ITC's domestic industry requirement ensures that the Commission is the proper authority to resolve the complainant's injury.²⁵

¹⁸ *About the USITC*, *supra* note 11.

¹⁹ *Id.*

²⁰ § 1332(b); *see* *Kyocera Wireless Corp. v. ITC*, 545 F.3d 1340, 1355 (Fed. Cir. 2003) ("The ITC is a creature of statute, and must find authority for its actions in its enabling statute.").

²¹ Jeremy W. Bock, *Neutral Litigants in Patent Cases*, 15 N.C. J. L. & Tech. 233, 240 (2014).

²² *See, e.g.*, *Certain Prepregs, Laminates, and Finished Circuit Boards*, Inv. No. 337-TA-659, (Aug. 4, 2012), at ¶1 (Complaint for Enforcement Proceedings under 19 C.F.R. 210.75).

²³ *See, e.g.*, § 1337(a)(2).

²⁴ *Id.*

²⁵ *See id.* §§ 1337(a)(2)-(3), (d)(2).

Section 337 states the Commission will deal with all unlawful importation, sale for importation, or sale after importation of any *article* that infringes a valid and enforceable United States patent, or that is “made, produced, processed, or mined under, or by means of” a valid and enforceable process patent.²⁶ But, the Commission does not have authority to deal with any unlawful act unless “an industry in the United States, relating to the *articles* protected by the patent . . . exists or is in the process of being established.”²⁷

The domestic industry requirement can be dissected into two components: an economic prong and a technical prong.²⁸ The former must be demonstrated with evidence of significant investment in plants or equipment, significant employment of labor or capital, or substantial investment in exploitation of the intellectual property right (e.g. research and development, engineering, or licensing).²⁹ The latter requires a complainant to establish that the purported industry relates to *articles* protected by the asserted intellectual property right.³⁰

If a complainant can satisfy the domestic industry requirement, and can establish that the imported goods infringe the complainant’s intellectual property rights, then the Commission may impose various forms of equitable relief against a foreign infringer.³¹ If the Commission determines that there was a violation under Section 337, the Commission can statutorily “direct that the *articles* concerned, imported by any person violating the provision of this section, be excluded from entry into the United States.”³² The barricades most often constructed to repel the advancing infringing imports are exclusion orders, general or limited, and cease and desist orders.³³

2. Exclusion Orders

An exclusion order is a form of injunctive relief instituted by the ITC that prevents infringing goods from entering the United States, and is enforced by the United States Customs and Border Protections (“CBP”) at the international

²⁶ *Id.* § 1337(a)(1)(B).

²⁷ *Id.* § 1337(a)(2).

²⁸ *InterDigital Comm’ns, LLC v. ITC*, 707 F.3d 1295, 1298 (Fed. Cir. 2013); *cf.* *Certain Integrated Circuits, Chipsets, & Products Containing Same Including Televisions*, Inv. No. 337-TA-786, Initial Determination at 158 (July 12, 2012) (stating that a separate technical prong analysis is not necessary when establishing domestic industry under 19 U.S.C. § 1337(a)(3)(C)).

²⁹ § 1337(a)(3)(A)-(C)

³⁰ 707 F.3d at 1298.

³¹ *See* §§ 1337(d)(1), (f)(1).

³² *Id.* § 1337 (d)(1) (establishing that when instituting an exclusion order, the Commission must examine the order’s potential effects on “the public health and welfare, competitive conditions in the United States economy, the production of like or directly competitive articles in the United States, and United States consumers”).

³³ *Hnath, supra* note 12, at 350-52, 350 n. 6.

borders.³⁴ A general exclusion order broadly prevents all infringing goods from entering the United States, while a limited exclusion order applies only to goods “manufactured, imported, [or] sold” by the named parties of the preceding ITC litigation.³⁵

Another form of equitable relief available to ITC litigants is a cease-and-desist order.³⁶ A cease-and-desist order is “a court’s or agency’s order prohibiting a person from continuing a particular course of conduct.”³⁷ For the ITC, the Commission may direct a violator “to cease and desist from engaging in the unfair methods or acts involved [in violating Section 337].”³⁸ In the case of foreign entity’s unlawful importation of infringing goods, the Commission may order the violating foreign entity to cease and desist from importing the infringing *articles*.³⁹ In contrast to exclusion orders, domestic industries may seek monetary damages, specifically civil penalties accruing daily, in a civil action before the Court of Appeals for the Federal Circuit against parties importing infringing *articles* in violation of the Commission’s cease and desist orders.⁴⁰

What is evident from the domestic industry requirement and the equitable relief available to successful complainants is the importance of the term “article” as it can preclude industries from ITC protection and prevent effective relief against foreign infringers.⁴¹ The question of what an “article” is has consistently perplexed practitioners, judges, and even the Commission itself, especially as technological advancements undermine the enforcement of valid intellectual property rights.⁴²

³⁴ *Id.* at 350.

³⁵ *Id.* at 351.

³⁶ § 1337(f).

³⁷ BLACK’S LAW DICTIONARY 268 (10th ed. 2009).

³⁸ § 1337(f)(1) (finding that the Commission must examine the cease-and-desist order’s effect on “the public health and welfare, competitive conditions in the United States economy, the production of like or directly competitive articles in the United States, and United States consumers”).

³⁹ *Id.* § 1338(b).

⁴⁰ *Id.* § 1337(f)(2).

⁴¹ *See id.* § 1337(a)(1) (noting when an article does not have valid patent, copyright, or trademark protection, it may be hard to prove substantial injury to an industry, therefore negating effective relief against infringers).

⁴² *See* Michael Weinberg, *What’s the Deal with Copyright and 3D Printing?*, INST. FOR EMERGING INNOVATION: PUB. KNOWLEDGE 1 (Jan. 2013), https://www.publicknowledge.org/files/What’s%20the%20Deal%20with%20Copyright_%20Final%20version2.pdf (discussing the need for reexamination of intellectual property rights, specifically copyrights, in light of advancements in three-dimensional printing).

B. Printing a Fortress: Three-Dimensional Printing Explained

Three-dimensional printing is a broad term describing manufacturing processes that construct physical goods from digital renderings through cross-sectional layering of materials such as metal, plastic, or even chocolate.⁴³ This layering, known as additive manufacturing, can be visualized as a child constructing a fort out of blocks, where the child is the printer and the fort is the three-dimensional good. The child constructs the fort from the bottom upwards, placing a new layer of blocks on top of the previous layer, until the fort is completed and will protect against sibling attack.⁴⁴ In the same fashion,⁴⁵ three-dimensional printers construct goods from the bottom upwards, placing a new cross-sectional layer of material on the previous layer, until the desired product is completed.⁴⁶

Just as the hypothetical child requires experiential knowledge or instructions for constructing his fort, a three-dimensional printer requires instructions for cross-sectional construction of a desired product.⁴⁷ Digital renderings, commonly produced as a computer-aided design (“CAD”) file, are virtual representations of a physical item and provide the tangible parameters expressed by the item, such as size, shape, and material.⁴⁸ Three-dimensional printers utilize the digital rendering as instructions for producing the physical good embodied by the virtual representation.⁴⁹ Because digital renderings are virtual in nature, these uploadable files can be distributed to three-dimensional printers on physical media, such as compact discs or portable flash-drives, or by directly downloading files from the Internet.⁵⁰

⁴³ See *3D Printing Materials: Plastic, Metal, Ceramics and More*, SHAPEWAYS, <http://www.shapeways.com/materials> (last visited Feb. 6, 2015) (highlighting the different metals and types of plastic available for 3D printing); see also Damon Poeter, *Hershey Shows Off 3D-Printed Chocolate*, PCMAG.COM (Dec. 19, 2014, 5:35 PM), <http://www.pcmag.com/article2/0,2817,2473988,00.asp>.

⁴⁴ See Lisa Winter, *Man Constructs 3D Printed Concrete Castle*, IFLSCIENCE! (Sept. 4, 2014), <http://www.iflscience.com/technology/man-constructs-3d-printed-concrete-castle> (demonstrating that 3D printing is completed in layers).

⁴⁵ *3D Printed Clothing Becoming a Reality*, RESINS ONLINE (June 17, 2013), <http://www.resins-online.com/blog/3d-printed-clothing/>.

⁴⁶ Jon Excell & Stuart Nathan, *The Rise of Additive Manufacturing*, THE ENGINEER (May 24, 2010), <http://www.theengineer.co.uk/in-depth/the-big-story/the-rise-of-additive-manufacturing/1002560.article>.

⁴⁷ Joe Hiemenz, *3D Printing With FDM*, STRATASYS, INC. 2, http://www.stratasys.com/~media/Main/Secure/White%20Papers/Rebranded/SSYS_WP_3d_printing_with_fdm.pdf (last visited Feb. 6, 2015).

⁴⁸ See Excell & Nathan, *supra* note 46.

⁴⁹ *Id.*

⁵⁰ See Hiemenz, *supra* note 47, at 3 (demonstrating that 3D printing can occur because of the opening of a file in special computer software).

1. Expansion, Annexation, and Dueling Economic Alliances

The advantages of three-dimensional printing have not gone unnoticed.⁵¹ Since the 1980s,⁵² technological advancement in three-dimensional printing has expanded in all directions within the commercial void.⁵³ Early versions of three-dimensional printers were excessively large, and priced out consumers with their sizable costs.⁵⁴ Yet, three-dimensional printing technology has experienced minimization⁵⁵ as well as large-scale application as companies and individuals appreciate the ability of additive manufacturing to supplant traditional methods.⁵⁶ Consequently, printable subject matter has simultaneously diversified from predominantly plastic parts⁵⁷ to full-size cars, edible food, and even human tissue.⁵⁸

2. A Printer in Every Home

Some predict three-dimensional printers will become a common household appliance in similar fashion to the personal computer, where proliferation oc-

⁵¹ Jane Bird, *Exploring the 3D Printing Opportunity*, FIN. TIMES (Aug. 8, 2012, 5:39 PM), <http://www.ft.com/intl/cms/s/0/6dc11070-d763-11e1-a378-00144feabdc0.html#axzz3RBPzSpY8>.

⁵² *Id.*

⁵³ See Tim Hayes, *The Future of 3-D Printing*, in OPTICS & PHOTONICS NEWS 22, 28-29 (noting both key uses in aerospace, medical and automotive sectors, and an expected growth in sales of about \$7.6 billion).

⁵⁴ Bird, *supra* note 51.

⁵⁵ Minimization is a term of art used in the engineering field for the decrease in size, shape, and other characteristics as technology progresses toward a favorable, operational or commercial result. An example of minimization is the relative decrease in physical size of cellular phones from the “brick phones” of the 1980s, to the modern iPhone. *Cf.* Josh Moorcroft, *Apple Co-Founder Steve Wozniak Claims iPhone 6 Plus is ‘Three Years Too Late,’* JBG NEWS (Nov. 13, 2014), <http://www.jbgnews.com/2014/11/apple-co-founder-steve-wozniak-claims-iphone-6-plus-is-three-years-too-late/225502.html> (describing how commercial pressures can cause reversal of minimization, as exemplified by the “phablet” industry); Emil Venere, *New 3-D Printing Algorithms Speed Production, Reduce Waste*, PURDUE NEWS (Oct. 21, 2014), <http://www.purdue.edu/newsroom/releases/2014/Q4/new-3-d-printing-algorithms-speed-production,-reduce-waste.html>.

⁵⁶ See Bird, *supra* note 51 (discussing the advantages that companies find in 3D printing).

⁵⁷ See U.S. Patent No. 4,575,330 at [1] (filed Aug. 8, 1984) (issued Mar. 11, 1986) (claiming an invention relating to “forming three-dimensional objects from a fluid medium and . . . the application of lithographic techniques to production of three-dimensional objects, whereby such objects can be formed rapidly, reliably, accurately and economically”).

⁵⁸ See, e.g., Stuart Nathan, *Building Body Parts with 3D Printing*, THE ENGINEER (May 24, 2010), <http://www.theengineer.co.uk/in-depth/analysis/building-body-parts-with-3d-printing/1002542.article> (detailing that, for example, the medical field is using 3D printers to create human tissue).

curred once computers became affordable.⁵⁹ The American economy, whether or not it has transitioned from manufacturing-based to service-based, relies on the physical transportation of goods from suppliers to consumers.⁶⁰ Prior to Internet commerce, consumers obtained products predominantly from local establishments, such as groceries or department stores, or from catalogs that offered to deliver the item to their home or a local store.⁶¹ However, Internet consumers are no longer limited to the physical transactions surrounding department store shopping or mail-order catalogs.⁶² Today, individuals often interact solely with a corporation's user interface, place an order online, pay electronically, and wait patiently for their package to arrive at their doorstep or the local post office.⁶³

Household three-dimensional printing will drastically alter commercial transactions, as consumers will no longer be bound to manufacturers and will instead trade directly with suppliers of plastics, metals, and other printable materials.⁶⁴ Just as music transitioned from physical delivery on vinyl records or compact discs to electronic delivery as digital audio files, manufactured goods such as toys, appliances, and even weaponry⁶⁵ will transition from gradual physical delivery to instantaneous electronic delivery as digital renderings used

⁵⁹ Tom Simonite, *Desktop Fabricator May Kick-Start Home Revolution*, NEW SCIENTIST (Jan. 9, 2007, 5:59 PM), http://www.newscientist.com/article/dn10922-desktop-fabricator-may-kickstart-home-revolution.html#.VGX4KlF_yA; see Alun Anderson, *A Whole New Dimension: Rich Homes Can Afford 3D Printers*, THE ECONOMIST (Nov. 15, 2007), <http://www.economist.com/node/10105016>.

⁶⁰ *The Logistics and Transportation Industry in the U.S.*, SELECTUSA, <http://selectusa.commerce.gov/industry-snapshots/logistics-and-transportation-industry-united-states> (last visited Jan. 21, 2015).

⁶¹ See Steve Wasserman, *The Amazon Effect*, THE NATION (May 29, 2012), <http://www.thenation.com/article/168125/amazon-effect> (highlighting the rise of Amazon and the simultaneous decline of both Barnes & Noble and independent bookstores).

⁶² *The Electronic Mall*, COMPUSERVE NOSTALGIA, <http://gsbrown.org/compuserve/electronic-mall-1984-04/> (last updated Apr. 30, 2010).

⁶³ See generally Hunter Skipworth, *What Happens When You Click Buy on Amazon*, POCKET-LINT (Dec. 18, 2012), <http://www.pocket-lint.com/news/118513-inside-amazon-fulfilment-centre> (detailing the process an item goes through once purchased online).

⁶⁴ See Bird, *supra* note 51.

⁶⁵ See Michael S. Rosenwald, *Weapons Made With 3D Printers Could Test Gun-Control Efforts*, WASH. POST (Feb. 18, 2013), http://www.washingtonpost.com/local/weapons-made-with-3-d-printers-could-test-gun-control-efforts/2013/02/18/9ad8b45e-779b-11e2-95e4-6148e45d7adb_story.html?hpid=z1; see also Andrea Ball, *Blueprints for 3-D Printer Gun Pulled Off Website*, STATESMAN (May 10, 2013, 1:17 PM), <http://www.statesman.com/news/news/blueprints-for-3-d-printer-gun-pulled-off-website/nXnbG/>; see also Natasha Lennard, *The Pirate Bay Steps in to Distribute 3D Gun Designs*, SALON (May 10, 2013, 5:11 PM), http://www.salon.com/2013/05/10/the_pirate_bay_steps_in_to_distribute_3d_gun_designs/.

in three-dimensional printing.⁶⁶ For example, instead of an individual ordering a new coffeemaker from a wholesale website and waiting days for delivery, an individual would purchase the coffeemaker online and promptly download the accompanying digital rendering for use with their household three-dimensional printer. The benefits to consumers are obvious, but the threats to manufacturers are ominous.⁶⁷

C. The Powder Keg of 3D Printing

In the trail of war, you will find thieves with plunder.⁶⁸ Unfortunately, the parallels between the transition of copyrighted materials and the eventual transition of manufactured products to electronic delivery of goods are not limited to the progressive benefits.⁶⁹ When audio recordings transitioned to digital files, thieves began to operate illegal file-sharing services. These file-sharing services enabled individuals to illegally download digital files and bypass payment to the proprietary owner.⁷⁰ Analogously, when consumer products transition from physical delivery to electronic delivery of a digital rendering, thieves will likely begin operating similar file-sharing networks where individuals can illegally exchange digital renderings for popular consumer products, bypassing any commercial transaction with the proprietary owner (i.e. the patent owner).⁷¹

One aspect that is unique to manufactured goods is the ability of foreign entities to independently create identical content.⁷² In the case of music downloads, there was no threat of foreign entities creating identical compositions for illegal download in the United States. There was never a Chinese counterfeit of popular songs because the content of the download, the performer's voice, is

⁶⁶ See generally Rakesh Sharma, *Can 3D Reshape Manufacturing in America?*, FORBES (June 17, 2014, 2:05 PM), <http://www.forbes.com/sites/rakeshsharma/2014/06/17/can-3d-printing-reshape-manufacturing-in-america/>.

⁶⁷ See Liat Clark, *Many Retailers Can Legally Force Suppliers to Switch to 3D Printing*, WIRED UK (Nov. 24, 2014), <http://www.wired.co.uk/news/archive/2014-11/24/andre-wegner-authentise> (noting that retailers can coerce their manufacturers to change their business model through digital rights ownership and quality control).

⁶⁸ See Lennard, *supra* note 65.

⁶⁹ See Chris Fox, *Piracy, Printing, and a New Era of Manufacturing*, MANUFACTURING.NET (Aug. 27, 2013, 9:47 AM), <http://www.manufacturing.net/blogs/2013/08/piracy-printing-and-a-new-era-of-manufacturing>.

⁷⁰ *Illegal File Sharing*, YALE INFO. TECH. SERVICES (Jan. 30, 2015, 11:00 AM), <http://its.yale.edu/secure-computing/illegal-file-sharing>.

⁷¹ *Id.*

⁷² Tim Lince, *Innovations Emerge to Pre-empt the Counterfeit Threat of 3D Printing*, WORLD TRADEMARK REV. (July 4, 2014), <http://www.worldtrademarkreview.com/Blog/detail.aspx?g=3d5fdade-8639-49d4-984e-e85eb037a827>.

unique and incapable of substitution.⁷³ Contrast that with manufactured products, where there is a threat that foreign entities will create identical products, especially if the physical dimensions, composition, and assembly are readily ascertainable.⁷⁴

Copyright law was significantly corrupted by the advent of file-sharing sites such as Napster,⁷⁵ as the lack of preventative measures allowed file-sharing to not only become widespread, but even socially acceptable.⁷⁶ A similar fate could befall patent law if preventative measures are not taken, including fortifications to prevent the importation of illegal digital renderings for use with three-dimensional printers. The war between infringers who electronically import illegal digital renderings and domestic patent holders will be decided quickly.⁷⁷ Any subsequent battles, however formidable, will be only vain attempts at altering fate through a legal means.⁷⁸ Thus, the United States must act quickly and demonstrate that the ITC has the statutory authority to protect domestic intellectual property rights from unlawful digital renderings imported electronically.

II. ASSASSINATION: FIRST SHOTS FIRED IN THREE-DIMENSIONAL WAR

A. Certain Digital Models

The scenario of a foreign entity importing infringing digital renderings into the United States is not as much fiction as patent-holders would hope.⁷⁹ In *Certain Digital Models, Digital Data, and Treatment Plans for Use, In Making Incremental Dental Positioning Adjustment Appliances Made Therefrom, and*

⁷³ See Theodore Giletti, *Why pay if it's free?: Streaming, downloading, and digital music consumption in the "iTunes era,"* 71 LONDON SCH. OF ECON. ELECTRONIC MSc DISSERTATION SERIES 3 (2012) (noting that illegal downloads of music have occurred but failing to mention if any counterfeit songs have been produced).

⁷⁴ Lince, *supra* note 72.

⁷⁵ See Giletti, *supra* note 73.

⁷⁶ *Piracy is Socially Acceptable, New Study Finds*, DIGITAL DIGEST (Mar. 1, 2011), <http://www.digital-digest.com/news-62914-Piracy-Is-Socially-Accepted-New-Study-Finds.html>.

⁷⁷ "The War was decided in the first twenty days of fighting, and all that happened afterwards consisted in battles which, however formidable and devastating, were but desperate and vain appeals against the decision of fate." *1914: Fight the Good Fight*, ALLAN MALLINSON, <http://www.allanmallinsonbooks.com/index.php/1914-fight-the-good-fight/> (last visited Feb. 7, 2015) (quoting Winston Churchill).

⁷⁸ *Id.*

⁷⁹ Lucas Osborn, *Digital Patent Infringement and the ITC*, PATENTLY-O (Apr. 30, 2014), <http://patentlyo.com/patent/2014/04/digital-patent-infringement.html>.

Methods of Making the Same,⁸⁰ a domestic patent holder (“complainant”) sought equitable relief from the ITC against a Pakistani corporation and its domestic counterpart (“respondents”).⁸¹ The complainant alleged that respondents imported digital renderings to manufacture customized dental aligners, and infringed existing United States patents on the aligners, methods of manufacture, and digital renderings.⁸² As alleged in the complaint, the Pakistani corporation created digital data sets for fabricating infringing aligners and these data sets were imported and sold to the domestic counterpart.⁸³

While the question of importation and infringement was easily decided, the electronically transmitted data sets posed a more unique question: is digital data an “article” under Section 337?⁸⁴ The significance of this question stemmed from the fact that the ITC’s jurisdiction is limited to “articles” that infringe a valid and enforceable intellectual property right, or arise from a protected process, which traditionally has been construed narrowly to include solely tangible items.⁸⁵ While the Commission’s judgment in favor of the domestic patent holder was later vacated by the Federal Circuit on other grounds,⁸⁶ the arguments of the parties and the Staff⁸⁷ are effective representations of the conflicting interpretations of “article” under Section 337.

⁸⁰ Certain Digital Models, Digital Data, and Treatment Plans for Use, In Making Incremental Dental Positioning Adjustment Appliances Made Therefrom, and Methods of Making the Same, Inv. No. 337-TA-833, (May 6, 2013) (Initial Determination).

⁸¹ *Id.* at 1.

⁸² *Id.* at 1, 6.

⁸³ *Id.* at 10-11.

⁸⁴ *The ITC Has Jurisdiction Over Digital File Transmissions Under Section 337*, CALDHAM, WICKERSHAM, & TAFT, LLP (Apr. 21, 2014), <http://www.cadwalader.com/resources/clients-friends-memos/the-itc-has-jurisdiction-over-digital-file-transmissions-under-section-337>.

⁸⁵ See 19 U.S.C. § 1337(a)(1)(B)-(E) (2012).

⁸⁶ *Align Tech., Inc. v. USITC*, 771 F.3d 1317, n. 8 (Fed. Cir. 2014)

We assume, for purposes of this opinion, that the Commission has statutory authority to exclude the importation of digital data that enters the United States through electronic transmission. Indeed, the Commission believed that it would have had such authority in this case had the Consent Order expressly referenced it. But we take no position on whether Section 337 permits the Commission to exclude such importations.

Id.

⁸⁷ See generally *id.* at 1319-21; see also *ITC Section 337 Litigation*, COOLEY LLP, <http://www.cooley.com/section337> (last visited Feb. 7, 2015) (explaining “The Staff” are the investigative attorneys of the ITC that may intervene in cases brought before the ITC and advocate on behalf of its interests).

1. *The Complainant: A Board Interpretation of “Article”*

The complainant advocated for a broad interpretation of the term “article,” contending that both tangible and intangible goods are within the ITC’s subject matter jurisdiction.⁸⁸ Relying on the Commission’s determination in *Certain Hardware Logic Emulation Systems and Components Thereof*,⁸⁹ the complainant contended that the ITC had previously held that the term “article” is inclusive of electronically transmitted digital data and relied on the statutory construction adopted in *Certain Hardware Logic*.⁹⁰

a. *Certain Hardware Logic*

In *Certain Hardware Logic*, a domestic patent holder sought enforcement of its patents concerning “hardware logic emulation systems and components thereof that are used in the semiconductor manufacturing industry to design and test the electronic circuits of semiconductor devices.”⁹¹ The claimed hardware logic emulation systems comprised hardware and software that temporarily represented large digital logic networks for designing and testing semiconductors.⁹² The accused products were similar hardware logic emulation systems and corresponding components, including software that could have been electronically transmitted into the United States.⁹³ The domestic patent holder sought a permanent limited exclusion order to prevent further importation of the foreign emulation systems.⁹⁴

The Commission granted equitable relief against the respondents’ software and data sets capable of electronic transmission into the United States.⁹⁵ The Commission held that the software and data sets were contributorily infringing certain claims of the asserted patents, and granted a cease-and-desist order.⁹⁶

⁸⁸ See *Certain Digital Models*, at 6-7 (citing *Certain Incremental Dental Positioning Adjustment Appliances*, Inv. No. 337-TA-562, Comm’n Op. at 7 (Jan. 23, 2013) and *Certain Devices for Connecting Computers*, Inv. No. 337-TA-360, USITC Pub. 2843, Comm’n Op. at 9 (Dec. 1994)).

⁸⁹ *Certain Hardware Logic Emulation Systems and Components Thereof*, Inv. No. 337-TA-383, USITC Pub. 2991 (Sept. 1996) (Final).

⁹⁰ See *Certain Digital Models*, at 7 (citing *Certain Set Top Boxes*, Inv. No. 337-TA-454, USITC Pub. 3564 304-05 (Nov. 8, 2012) (Final)).

⁹¹ *Certain Hardware Logic Emulation Systems and Components Thereof*, Inv. No. 337-TA-383, at 1 (Mar. 1998) (Op. on Remedy, the Public Interest, and Bonding).

⁹² *Id.*

⁹³ *Id.* at 3.

⁹⁴ *Id.* at 11.

⁹⁵ *Id.* at 2-3.

⁹⁶ *Id.* at 18. The Commission emphasized that Section 337 is not limited to only direct infringement of a valid and enforceable patent as the statute does not make any differentiation between direct and indirect infringement; the statute allows the Commission to equally react to unfair competition relating to contributory infringement. *Id.* at 18-19.

According to the Commission, “no U.S. customer would purchase the respondents’ emulation system . . . if the customer did not have access to respondents’ software, because the system would be inoperable.”⁹⁷ Thus, the Commission issued the order, precluding the importation of any contributorily infringing software.⁹⁸

Traditionally, CBP officers enforce the Commission’s cease-and-desist orders. Such orders prevent software from entering the United States on compact discs or other tangible, magnetic medium.⁹⁹ However, the respondents’ software had the potential to circumvent these traditional protections through electronic, rather than physical, transmission.¹⁰⁰ The Commission stated that “electronic transmission of the respondents’ software is not substantively different from storing the software on a magnetic medium (such as a diskette) and shipping [that] into the United States,” and that remedial orders must target the infringing software.¹⁰¹

b. Align Technology, Inc. v. ITC

Similarly, the patent holder in *Align Technology, Inc. v. ITC* asserted that the digital data sets of the Pakistani corporation were “articles” under Section 337.¹⁰² According to the patent holder, there is “nothing in the unqualified word ‘articles’ that inherently narrows the scope of [S] or Section 337.”¹⁰³ Echoing the Commission in *Certain Hardware Logic*, the patent holder contended that the scope of Section 337 is intentionally broad to allow the Commission to adapt to technological advancements in media, such as digital data, and methods of production and distribution, including the Internet.¹⁰⁴ Congress intended the Commission to protect domestic industry from all kinds of unfair trade practices, especially foreign infringement, and “nothing since [the legislation’s enactment] indicates any [c]ongressional intent to narrow [the Commission’s] remedial authority.”¹⁰⁵

⁹⁷ *Id.* at 27.

⁹⁸ *Id.* at 28.

⁹⁹ *Id.* at 5-6.

¹⁰⁰ *Id.* at 5.

¹⁰¹ *Id.*

¹⁰² Certain Digital Models, Digital Data, and Treatment Plans for Use, In Making Incremental Dental Positioning Adjustment Appliances Made Therefrom, and Methods of Making the Same, Inv. No. 337-TA-833, at 6 (May 6, 2013) (Initial Determination).

¹⁰³ *Id.* at 7.

¹⁰⁴ *Id.* at 7.

¹⁰⁵ *Id.* at 7.

c. Legislative History: Behind the Tariff Act

Furthermore, the Commission concluded that the legislative history of Section 337 supported the ITC's actions against the respondents' electronically transmitted software.¹⁰⁶ According to the Commission, the 1988 amendments to the Tariff Act were intended to "strengthen the effectiveness of Section 337 in addressing the growing problems being faced by U.S. companies from the importation of [infringing] articles."¹⁰⁷ The Commission concluded that the statute was meant to more effectively "cover a broad range of unfair acts," and preventing the importation of infringing software through remedial orders was well within that purpose.¹⁰⁸ Thus, the Commission held that software could be fairly defined as an "article" within the context of Section 337 as there was "a direct nexus between the respondents importation of their software [via electronic transmission or otherwise] and [the] infringement of the [asserted] patents in issue."¹⁰⁹

2. The Respondent: A Narrow Interpretation of "Article"

The respondents advocated for a narrow interpretation of "article" under Section 337,¹¹⁰ stating that the imported digital data sets were not covered by the ITC's jurisdiction.¹¹¹ The Federal Circuit's recent interpretation of the term "article" in *Bayer AG v. Housey Pharmaceuticals, Inc.* supported the respondent's contention that the ITC could not impede importation of their digital data sets.¹¹²

a. Bayer AG v. Housey Pharmaceuticals, Inc.

In *Bayer AG*, the patents were directed to "a method of screening for substances which specifically inhibit or activate a particular protein affecting the cultural or morphological characteristics of the cell expressing the protein."¹¹³ The patented process allows one to determine whether the agent is a protein activator or inhibitor by characterizing the level of protein production in the

¹⁰⁶ *Certain Hardware Logic Emulation Systems*, at 28.

¹⁰⁷ *Id.* at 28-29.

¹⁰⁸ *Id.*

¹⁰⁹ *Certain Hardware Logic Emulation Systems and Components Thereof*, Inv. No. 337-TA-383, USITC Pub. 3089 at 21 (July 31, 1998) (Final).

¹¹⁰ *Certain Digital Models*, at 11. The respondents also contend that the term "importation" under Section 337 is similarly limited to tangible delivery, barring remedial action against electronic transmissions by the ITC. *Id.*

¹¹¹ *Id.*

¹¹² *Id.* at 11-12.

¹¹³ *Bayer AG v. Housey Pharm., Inc.*, 340 F.3d 1367, 1369 (Fed. Cir. 2003).

cell.¹¹⁴ In response to a declaratory judgment action for invalidity, unenforceability, and non-infringement by the foreign pharmaceutical supplier, the patent holder asserted infringement of its patents pursuant to § 271(g).¹¹⁵ The patent holder alleged that the foreign pharmaceutical suppliers imported “the critical information, the identification and characterization of a drug, which is made [through the] patented process,” and sold of “the drug made by the patented process,” and that these actions constituted infringement.¹¹⁶

Relying on *Bayer AG v. Housey Pharmaceutical, Inc.*,¹¹⁷ the respondents contended that the Federal Circuit, in construing the term “manufacture” under 35 U.S.C. § 271(g), had determined that “article” does not cover digital data and other intangible goods.¹¹⁸ Section 271(g) states, “Whoever without authority imports into the United States or offers to sell, sells, or uses within the United States a *product which is made by a process patented* in the United States shall be liable as an infringer.”¹¹⁹ The patent holder contended that, while the drug is clearly a product of the patented process, the critical information is a product of the patented process as well.¹²⁰ Conversely, the pharmaceutical suppliers argued that the term “made” under the statute means “manufactured,” and therefore the statute only applies to physical goods produced by a patented process.¹²¹

b. Construing What is “Made”

The court’s analysis centered on the proper construction of the term “made,” and whether the term includes intangible goods (i.e. the critical information).¹²² Relying on dictionary definitions, the court reasoned the term “made” is a verb,¹²³ and therefore, it must refer to “bring[ing] (a material thing) into being

¹¹⁴ *Id.*

¹¹⁵ *Id.*

¹¹⁶ *Id.* at 1370.

¹¹⁷ *See generally id.*

¹¹⁸ Certain Digital Models, Digital Data, and Treatment Plans for Use, In Making Incremental Dental Positioning Adjustment Appliances Made Therefrom, and Methods of Making the Same, Inv. No. 337-TA-833, at 11-12 (May 6, 2013) (Initial Determination).

¹¹⁹ *Bayer AG*, 340 F.3d at 1371.

¹²⁰ *Id.*

¹²¹ *Id.*

¹²² *Id.* at 1370-71.

¹²³ *Id.* at 1372. The court later stressed the importance of the grammatical characteristic of the term “made” as a verb in the statute in rebutting the complainant’s argument that “manufacture” cannot be synonymous with “made by” as it would render the term superfluous in the context of 35 U.S.C. § 101. *See* 35 U.S.C. § 101 (2012); *see also* 340 F.3d at 1373 (concluding that the term “manufacture” is used as a noun in § 101, and thus is inapplicable in the construction of “made” under § 271(g)).

by forming, shaping, or altering material.” Therefore, “made” is synonymous with “manufactured.”¹²⁴

The court subsequently examined other statutory provisions for construction of “made.” Based on a related statute from the Omnibus Trade and Competitiveness Act of 1988 that created § 271(g),¹²⁵ the court concluded that because the term “manufacture” was used to describe the maker of product in another provision, this clearly indicated that “made” was intended to mean “manufactured” in § 271(g) as well.¹²⁶ Similarly, the court examined the statutory exceptions under § 271(g). The exceptions specified that if a “product is materially changed by subsequent processes” or “becomes a trivial and nonessential component of another product,” this does not constitute infringement.¹²⁷ While the complainant argued that the information was itself a product, the court found that this interpretation conflicted with the physical transformation infringement exception contained in the statute.¹²⁸

c. Legislative History: Congressional Intent of 271(g)

The court’s examination of extrinsic evidence concerning “made” under § 271(g) also examined the congressional intent underlying the statute.¹²⁹ According to the court, Congress’ enactment of the statute was influenced by other infringement remedies, as § 271(g) was enacted “to provide new remedies to supplement existing remedies available from the International Trade Commission (“ITC”) under [Section 337].”¹³⁰ Congress recognized the insufficiency of equitable remedies under Section 337 to protect intellectual property owners from the importation of products resulting from patented processes.¹³¹ According to a House Report preceding the enactment of § 271(g), “while a domestic manufacturer using the patented process would infringe the process patent, a foreign manufacturer who imports the product would not [under the current patent law].”¹³² The court interpreted this to suggest that § 271(g) was intended to cover the same “articles” falling under the ITC’s jurisdiction, and to create

¹²⁴ 340 F.3d at 1372.

¹²⁵ *Id.*

¹²⁶ *Id.*

¹²⁷ *Id.* at 1372-73 (citing 35 U.S.C. § 271(g)(1)-(2) (2012)).

¹²⁸ *Id.* at 1373. To conclude that the first exception under § 271(g) requires the physical transformation of the product, the court inherently construes the term “materially” to refer to the physical composition of the product – instead of the importance of the change to the entire product. *Id.*

¹²⁹ *Id.* at 1373-74.

¹³⁰ *Id.* at 1373.

¹³¹ *Id.* at 1374; *cf.* 19 U.S.C. §1337(a)(1)(B) (2012).

¹³² 340 F.3d at 1376 (citing H.R.REP. NO. 100-60 at 3 (1987)).

additional remedies against foreign infringers.¹³³ However, the court found the legislative history devoid of any suggestion “that Congress was concerned that the preexisting statutory scheme failed to reach intangible information, or that the substantive coverage . . . was to be expanded.”¹³⁴ When faced with silence in the legislative history to the contrary, the court found that interpreting “made” any more broadly than covering manufactured, physical articles would be improper.¹³⁵ The court reasoned that interpreting the statute to cover more than manufactured goods would “lead to anomalous results” as “[t]he importation of information [i.e. knowledge that substances are activating or inhibiting] in the abstract . . . cannot be easily controlled,”¹³⁶ especially when knowledge is the intangible property of the mind.¹³⁷

3. *The Court: Digital Data Sets are Clearly Articles*

Despite the respondents’ arguments that “article” should be limited to tangible products (discussed *infra*), the Commission held that digital data sets produced by the Pakistani corporation, and imported electronically into the United States, “are clearly articles over which the [ITC] has jurisdiction and authority.”¹³⁸ While the Commission’s determination in *Certain Digital Models* continued the ITC’s lineage of instituting remedial measures covering electronic transmitted data, the Federal Circuit vacated the Commission’s order for improper review and remanded for further proceedings.¹³⁹

III. STATUTORY INTERPRETATION OF “ARTICLE” THROUGH THE LENS OF PATENT LAW

Section 337 prohibits the importation, sale for importation, or sale after importation of articles that “(i) *infringe* a valid and enforceable United States patent.”¹⁴⁰ This romanette helps contain the amorphous collection of goods and products within the ITC’s protection.¹⁴¹ The word “infringe” within the trade

¹³³ *Id.* at 1374.

¹³⁴ *Id.*

¹³⁵ *Id.* at 1376.

¹³⁶ *Id.*

¹³⁷ *What is Intellectual Property?*, WORLD INTELL. PROP. ORG., <http://www.wipo.int/about-ip/en/> (last visited Feb. 8, 2015).

¹³⁸ *Certain Digital Models, Digital Data, and Treatment Plans for Use, In Making Incremental Dental Positioning Adjustment Appliances Made Therefrom, and Methods of Making the Same*, Inv. No. 337-TA-833, at 18 (May 6, 2013) (Initial Determination).

¹³⁹ *See Align Tech., Inc. v. USITC*, 771 F.3d 1317, 1326, n. 8 (Fed. Cir. 2014).

¹⁴⁰ 19 U.S.C. § 1337(a)(1)(B)(i) (2012).

¹⁴¹ *Hughes Aircraft Co. v. Jacobson*, 525 U.S. 432, 438 (1999) (stating statutory construction of an otherwise ambiguous term begins with the language of the statute).

statute imputes its own legal meaning upon the otherwise ambiguous term “article” under Section 337.¹⁴² Thus, the term “article” under Section 337 can be defined within the context of the infringement doctrines codified under § 271.¹⁴³

A. Infringement of a Valid and Enforceable Patent

Patent infringement, like an enemy’s attacks, can take various forms: direct or indirect; literal or equivalent; contributory or induced.¹⁴⁴ Given that the ITC’s protections are defined by the parameters of the term “article,” the different forms collectively create the perimeter of the ITC’s domestic fortress.

A patent confers on an inventor the right to prevent another from making, using, selling, or offering for sale the fruits of the inventor’s labor, and infringement represents a breach of these rights.¹⁴⁵ Conceptually, a patent can be viewed as a contract between the inventor and the public (*i.e.* the public domain).¹⁴⁶ The public’s agent, the government, offers an inventor a twenty-year contract for exclusive production of her invention, in exchange for the inventor’s disclosure of the useful, novel, and nonobvious technology.¹⁴⁷ Infringement is a public citizen’s breach of that contract, entitling the inventor to restitution commonly in the form of monetary damages.¹⁴⁸ Similarly, under Section 337, an imported “article” that infringes a valid and enforceable patent constitutes a breach of the public’s contract with the inventor for sole control of the invention’s market.¹⁴⁹

1. Direct Infringement

The most basic form of infringement is direct infringement, which occurs when an individual “makes, uses, offers to sell, or sells any patented invention . . . during the term of the patent” without the authority of the patent holder.¹⁵⁰ Direct infringement is established through a comparison of the product with the elements of the asserted patent’s claims to determine if the accused product

¹⁴² § 1336(h)(1).

¹⁴³ See 35 U.S.C. § 271(b) (2012).

¹⁴⁴ *Suprema, Inc. v. ITC*, 742 F.3d 1350, 1358 (Fed. Cir. 2013).

¹⁴⁵ *What is IP Law?*, AM. INTELL. PROP. L. ASS’N, <http://www.aipla.org/about/iplaw/Pages/default.aspx> (last visited Feb. 8, 2015).

¹⁴⁶ Phillip B.C. Jones, *Violation of a Patent License Restriction: Breach of Contract or Patent Infringement?*, 33 IDEA 225, 226 (1993).

¹⁴⁷ *Id.* at 225.

¹⁴⁸ *Id.* at 226.

¹⁴⁹ 19 U.S.C. § 1337(a)(1)(B)(i) (2012).

¹⁵⁰ 35 U.S.C. § 271(a) (2012).

is the patented invention.¹⁵¹ If the accused product embodies all the elements of the patent's claims, then the product directly infringes the patent.¹⁵² An accused product may embody the patent's elements literally or equivalently, but if even one element is missing in the accused product, infringement cannot be established as a matter of law.¹⁵³

In the context of three-dimensional printing, direct infringement occurs when an individual "prints" a patented product without the patent holder's consent through either sale, license, or through an illegally downloaded CAD file.¹⁵⁴ Establishing direct infringement would be quick and painless, as the printed product likely embodies the exact patented product portrayed in the digital rendering.¹⁵⁵ In other words, the individual has produced an article that infringes a domestic patent. However, this is only the first instance of infringement in the context of three-dimensional printing.¹⁵⁶

2. Indirect Infringement

Indirect infringement, unlike direct infringement, enters under the cloak of darkness. Indirect infringement often results when an infringer circumvents an inventor's right to restrict the making, producing, and selling of his invention.¹⁵⁷ There are presently two types of indirect infringement:¹⁵⁸ contributory infringement and induced infringement.¹⁵⁹

a. Contributory Infringement

Contributory infringement occurs when an individual intentionally provides a willful infringer with a component of a patented invention that is a material

¹⁵¹ ROBERT P. MERGES ET AL., *INTELLECTUAL PROPERTY IN THE NEW TECHNOLOGICAL AGE* 324, (Wolters Kluwer Law & Bus., 6th ed. 2012).

¹⁵² *Suprema, Inc. v. ITC*, 742 F.3d 1350, 1360 (Fed. Cir. 2013).

¹⁵³ *Patent Infringement*, O'BANION & RITCHEY LLP, <http://www.intellectual.com/infringement.htm> (last visited Feb. 8, 2015).

¹⁵⁴ Davis Doherty, *Downloading Infringement: Patent Law as a Roadblock to the 3D Printing Revolution*, 26 *HARV. J. L. & TECH.* 353, 354, 356 (2012).

¹⁵⁵ *Id.* at 360. This example ignores the potentially exponential possibilities for an illegal supplier to alter the digital rendering of a patented product, and the required analysis under the doctrine of equivalents that would result in such a scenario.

¹⁵⁶ *See id.*

¹⁵⁷ *Id.*

¹⁵⁸ *Id.* The word "presently" alludes to the concurrently progressing advocacy of Professors Timothy Holbrook and Lucas Osborn for a third type of indirect infringement, known as "digital infringement," which would aim to combat infringement that utilizes the Internet or other digital media. Timothy R. Holbrook & Lucas S. Osborn, *Digital Patent Infringement in an Era of 3D Printing*, 48 *U.C. DAVIS L. REV.* (forthcoming 2015) (manuscript at 22, 25) (on file at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2483550).

¹⁵⁹ Doherty, *supra* note 154, at 360.

part of the invention, but is not a staple good or commodity.¹⁶⁰ Such a component does not have any other substantial non-infringing use.¹⁶¹ For example, if an unpatented medical device has no other use except in practicing a patented process, then the unpatented medical device contributorily infringes the patented process.¹⁶² However, if the medical device has a substantial non-infringing use, such as use in an unrelated medical procedure, then the medical device does not aid an individual in infringing the patented process.¹⁶³ Therefore, supplying someone with the medical device would not constitute contributory infringement.

Contributory infringement allows an inventor to “temporarily extend his monopolistic market power to unpatented items used in or with his invention since...he is not given a patent in terms over the unpatented items.” Yet, he must prevent subversion by those who would facilitate another’s breach of his contract with the American public.¹⁶⁴ In the majority of cases, contributory infringement involves tangible components that are uniquely tailored for combination with others to form the patented invention.¹⁶⁵ However, the Supreme Court has not ruled out that a component within the context of patent infringement could manifest itself in the form of intangible components, such as software.¹⁶⁶

i. Case Study: Microsoft Corp. v. AT&T Corp.

In *Microsoft Corporation v. AT&T Corporation*,¹⁶⁷ telecommunications giant AT&T alleged that Microsoft was liable for infringement of their patented “apparatus for digitally encoding and compressing recorded speech” under § 271(f).¹⁶⁸ Specifically, AT&T alleged that Microsoft’s Windows operating system could enable a computer to practice the patented speech processor after installation, in particular installation occurring overseas.¹⁶⁹ Section 271(f) provides U.S. patent holders with protections against foreign infringers who sup-

¹⁶⁰ MARTIN J. ADELMAN ET AL., CASES AND MATERIALS ON PATENT LAW 742 (West, 3rd ed. 2009).

¹⁶¹ 35 U.S.C. § 271(c) (2012); ADELMAN ET AL., *supra* note 160.

¹⁶² ADELMAN ET AL., *supra* note 160, at 744.

¹⁶³ § 271(c).

¹⁶⁴ Rohm and Haas Co. v. Dawson Chemical Co., 599 F.2d 685, 697 (5th Cir. 1979).

¹⁶⁵ See, e.g., Briggs & Stratton Corp. v. Kohler Co., 2006 WL 6005798 (W.D. Wisc. 2006).

¹⁶⁶ Microsoft Corp. v. AT&T Corp., 550 U.S. 437, 452 n.13 (2007) (“If an intangible method or process, for instance, qualifies as a ‘patented invention’ under §271(f) (a question as to which we express no opinion), the combinable components of that invention might be intangible as well.”).

¹⁶⁷ *Id.* at 437.

¹⁶⁸ *Id.* at 441-42.

¹⁶⁹ *Id.* at 442.

ply or cause to be supplied “all or a substantial portion of the components of a patented invention, where such components are uncombined in whole or in part, in such manner as to actively induce” infringement through their combination outside the United States.¹⁷⁰ The Supreme Court found that AT&T’s allegations failed under § 271(f) as Microsoft did not actively export copies of the operating system from the United States for installation on the accused foreign computers.¹⁷¹

Both § 271(f) and § 271(c), the sections establishing contributory infringement based on an infringer’s combination of components, domestically or internationally, used to circumvent a valid and enforceable patent.¹⁷² In analyzing the software company’s liability for foreign installation of its operating system, the Supreme Court had to determine when software (i.e. the operating system) constituted a component of a patented invention.¹⁷³ The Court examined software as two, distinct forms¹⁷⁴: (1) “the [software] instructions themselves detached from any medium,” or (2) a copy fixed on an “activating medium,” such as a compact disc or downloaded Internet file.¹⁷⁵ According to the Court, components under § 271(f) must be “amenable to combination” or by “other means of interfacing with the computer.”¹⁷⁶ The operating system in the abstract did not qualify, but the Court found that a copy, which included an intangible Internet file, could be a combinable component substantiating a claim of infringement.¹⁷⁷

¹⁷⁰ *Id.* at 445; 35 U.S.C. § 271(f) (2012).

¹⁷¹ 550 U.S. at 452.

¹⁷² §§ 271(c), (f).

¹⁷³ 550 U.S. at 447 (“This case poses two questions: First, when, or in what form, does software qualify as a ‘component’ under § 271(f)? Second, were ‘components’ of the foreign-made computers involved in this case ‘supplie[d]’ by Microsoft ‘from the United States.’”).

¹⁷⁴ *Id.*

¹⁷⁵ *Id.* at 447-49.

¹⁷⁶ *Id.* at 449, 451.

¹⁷⁷ *Id.* at 451-52. In the dicta of the majority opinion, the Supreme Court analogized software in the abstract to blueprints and other instruments “containing design information, e.g., a schematic, template, or prototype.” *Id.* at 449-50. The Court stated, “A blueprint may contain precise instructions [similar to software in the abstract] for the construction and combination of the components of a patented device, but it is not itself a combinable component of that device.” *Id.* at 450. The Court further stated that Congress had the ability to include “information, instructions, or tools from which those components readily may be generated” within § 271(f), but did not. *Id.* at 451. Comparable to the rate of obsolescence for software, this view of blueprints and other information representing the invention entirely will be increasingly regarded as archaic in light of advancements in three-dimensional printing. Holbrook & Osborn, *supra* note 158, at 32.

b. Induced Infringement

Induced infringement occurs when an individual possesses the specific intent to cause another's direct infringement of a valid and enforceable patent.¹⁷⁸ The requisite affirmative intent of the inducing party can be evidenced by advertisements or instructions actively encouraging infringement of information or a product. The inducing party's knowledge of another's direct infringement alone is not sufficient to support an induced infringement claim.¹⁷⁹

For example, a hypothetical competing medical device infringes a patent when used in a certain application, and is being supplied by a large, corporate medical supplier to pediatricians. If the corporation only had knowledge that pediatricians were using the medical devices for infringing, unadvertised uses, then the corporation is not liable under induced infringement.¹⁸⁰ However, if the corporation actively encouraged pediatricians to use the medical device in an infringing manner through its advertisements, then the corporation may have actively induced infringement of the patent by the pediatrician.¹⁸¹ Yet, an inducer's specific intent is inconsequential in proving induced infringement unless direct infringement has resulted.¹⁸²

i. Case Study: Suprema, Inc. v. ITC

The direct infringement requirement under § 271(b) *nearly* caused significant impediments to policing indirect infringement under Section 337.¹⁸³ In *Suprema, Inc. v. ITC*, a foreign importer appealed the Commission's institution of an exclusion order against the importer's optical scanning devices based on their alleged induced infringement of the complainant's patent.¹⁸⁴ The Commission had concluded that the importer had induced a third party to directly infringe the complainant's patent.¹⁸⁵ The Commission found the importer had the specific intent to induce infringement by willfully blinding itself to the do-

¹⁷⁸ MERGES ET AL., *supra* note 151, at 364; ADELMAN, ET AL., *supra* note 160, at 749, 751.

¹⁷⁹ ADELMAN ET AL., *supra* note 160, at 751; *see* DSU Med. Corp. v. JMS Co., 471 F.3d 1293, 1306 (Fed. Cir. 2006) (detailing the requirements for induced infringement).

¹⁸⁰ ADELMAN ET AL., *supra* note 160, at 751 (noting that mere knowledge is not enough to support induced infringement).

¹⁸¹ The pediatrician is directly infringing the patent when it uses the infringing medical device in that certain application protected by the patent. *Cf.* DSU Med. Corp., 471 F.3d at 1305 (citing MGM Studios, Inc. v. Grokster, Ltd., 545 U.S. 913).

¹⁸² Hautau v. Kearney & Trecker Corp., 179 F.Supp 490, 493 (E.D. Mich. 1959) ("The common law of contributory infringement, however, was that there could be no contributory infringement to which to contribute or, in other words, without actual infringement.").

¹⁸³ Suprema, Inc. v. ITC, 742 F.3d 1350, 1352 (Fed. Cir. 2013), *vacated*, No. 2012-1170, 2014 WL 3036241 (Fed. Cir. 2014).

¹⁸⁴ *Id.*

¹⁸⁵ *Id.* at 1355.

mestic patent. Specifically, the importer had emulated the patent holder's products, willfully ignored the third party's infringing activities, and even encouraged the third party's actions.¹⁸⁶ However, the Federal Circuit vacated the resulting exclusion order against the importer based on the requirement of direct infringement.¹⁸⁷

The Commission and the Federal Circuit agreed that the importer's optical scanning devices, when combined with the third party's software, directly infringed the complainant's claimed method of detecting and qualifying fingerprint images.¹⁸⁸ However, this infringing combination did not occur until after the optical scanners were imported into the United States.¹⁸⁹ An article must infringe at the moment of importation for the ITC to issue remedial measures.¹⁹⁰ The Federal Circuit did not dispute the Commission's ability to impose equitable relief based on direct or indirect infringement.¹⁹¹ However, the Federal Circuit vacated the Commission's determinations regarding the patented fingerprint method because the court concluded the Commission could not rely on induced infringement without demonstrating the articles directly infringed at importation.¹⁹²

Whether the product of happenstance or foresight, the Federal Circuit has vacated the *Suprema* decision pending a rehearing en banc.¹⁹³ In *Suprema*, the Federal Circuit, in dicta, expressed its reservations in holding that the ITC cannot act based upon induced infringement without direct infringement at the moment of importation.¹⁹⁴ The majority stated that the Commission had been left "powerless [by the statute] to remedy acts of induced infringement" by Section 337's ties to importation.¹⁹⁵ As Judge Reyna articulated in his partial dissent,

Section 337 is a trade statute designed to provide relief from specific acts of unfair trade, including acts that lead to the importation of articles that will result in harm to a domestic industry by virtue of infringement of a valid and enforceable patent.¹⁹⁶

Imposition of a strict temporal limitation on Section 337's intentionally broad remedy for intellectual property holders would contradict Congress' in-

¹⁸⁶ *Id.*

¹⁸⁷ *Id.* at 1357.

¹⁸⁸ *Id.*

¹⁸⁹ *Id.*

¹⁹⁰ *Id.* at 1363.

¹⁹¹ *Id.* (detailing that the Commission's ability to impose equitable relief would not be reviewed).

¹⁹² *Id.*

¹⁹³ *Suprema, Inc. v. ITC*, No. 2012-1170, 2014 WL 3036241 *1 (Fed. Cir. 2014) (granting petition for rehearing en banc and vacating the court's previous opinion).

¹⁹⁴ *Suprema, Inc. v. ITC*, 742 F.3d 1350, 1363 (Fed. Cir. 2013), *vacated*, No. 2012-1170, 2014 WL 3036241 (Fed. Cir. 2014).

¹⁹⁵ *Id.* at 1357.

¹⁹⁶ *Id.* at 1372 (Reyna, J. concurring-in-part, dissenting-in-part).

tent to prevent all unfair acts harmful to U.S. trade.¹⁹⁷ As also aptly stated by Judge Reyna, there is

[N]o distinction between importing an article that meets all limitations of an apparatus claim as it crosses the border, and actively inducing infringement by importing an article and encouraging another to use that article to practice a patented method.¹⁹⁸

Stated another way, induced infringement should be treated no differently than direct infringement under Section 337 as both are unfair trade practices harming domestic industries.

3. Infringement in 3D Printing

In the context of three-dimensional printing, any contributory or induced infringement is invisible to the naked eye or lies hidden within the shadows.¹⁹⁹ While direct infringement occurs when the patented invention is created by the three-dimensional printer,²⁰⁰ indirect infringement occurs prior to production of the patented invention.²⁰¹ In other words, any indirect infringement occurs when the patented invention is still only a CAD file on the almost infringer's hard drive or readily accessible through file-sharing services.²⁰²

Arguably, the CAD file contributorily infringes the domestic patent as the digital rendering that encompasses the invention's physical design. The CAD file is made especially for the infringer's direct infringement and has no substantial non-infringing use as a commodity of commerce.²⁰³ Similarly, the CAD file is knowingly sold or distributed by the foreign entity with the specific in-

¹⁹⁷ *Id.* at 1374-75 (Reyna, J. concurring-in-part, dissenting-in-part).

¹⁹⁸ *Id.* at 1377 (Reyna, J. concurring-in-part, dissenting-in-part).

¹⁹⁹ *See* Holbrook & Osborn, *supra* note 158, at 11 (“[G]iven how diffuse the printers may be, it may be difficult for the patent owner to identify who these infringers are.”).

²⁰⁰ *See id.*

²⁰¹ Indirect infringement cannot occur unless direct infringement is caused by or intended to be caused by the would-be indirect infringer. And because any party liable for indirect infringement causes or intends to cause the fabrication by the 3D printer, any instance of indirect infringement necessarily precedes the invention coming into being. *See* Holbrook & Osborn, *supra* note 158, at 12-14, 23 (explaining that patent law offers two forms of indirect infringement: active inducement and contributory infringement, illustrating that active inducement requires, among other things, direct infringement and the specific intent to induce a third party to infringe, and noting that one requirement for contributory infringement is conduct resulting in an act of direct infringement).

²⁰² *See id.* at 12-13 (“[Indirect infringement] liability arises for a party when she facilitates the infringement of someone else, such as when a third party makes an infringing item from the CAD file.”)

²⁰³ *See, e.g.,* Dawson Chem. Co. v. Rohm and Haas Co., 448 U.S. 176, 188 (1980) (“[Contributory infringement doctrine] exists to protect patent rights from subversion by those who, without directly infringing on the patent themselves, engage in acts designed to facilitate infringement by others.”).

tent to induce the downloading party to directly infringe the domestic patent through three-dimensional printing.²⁰⁴

In both instances of indirect infringement that are illustrated, there is clearly an intentional breach of the public's contract with the inventor.²⁰⁵ Some legal scholars have even advocated for the creation of a third type of infringement called "digital patent infringement" to specifically combat the "transfer of CAD files designed to print the invention."²⁰⁶ While these scholars believe that liability for CAD files under indirect infringement will only provide limited coverage from digital infringers, the ITC's protections under Section 337 are merely "informed by U.S. patent law" and should not be subject to the same weaknesses.²⁰⁷

B. Recent Cease Fires in Technological Wars

In *Certain Digital Models*, the complainant and the Commission flatly dismissed the respondents' proposed construction of "article" in the context of the patentable subject matter under § 101.²⁰⁸ The administrative law judge in the case stated that the issue was not whether the asserted patent was valid under §101, as that defense was not raised; instead, the issue was "whether or not the digital data sets were 'articles.'"²⁰⁹ Although the Commission was correct that the true issue was the construction of "article," the Commission wrongly scorned the opportunity to construe the term "article" using §101 as merely an improperly raised defense.²¹⁰

²⁰⁴ Contributory infringement is the "intentional aiding of one person by another in the unlawful making or selling or using of a patented invention." *Pierce Wrapping Mach. Co. v. Terkelsen Mach. Co.*, 300 F. 147, 159 (D.C. Mass. 1924).

²⁰⁵ 35 U.S.C. § 271(b) (2012); *see* *Suprema, Inc. v. ITC*, 742 F.3d 1350, 1362 (Fed. Cir. 2013), *vacated*, No. 2012-1170, 2014 WL 3036241 (Fed. Cir. 2014).

²⁰⁶ *See generally* *Holbrook & Osborn*, *supra* note 158, at abstract.

²⁰⁷ Brief for Am. Intellectual Prop. Law Ass'n as Amicus Curiae Supporting Neither Party at 9-10, *Suprema Inc. v. ITC*, 742 F.3d 1350 (Fed. Cir. 2013) (No. 2012-1170).

²⁰⁸ *Certain Digital Models Digital Data, and Treatment Plans for use, in Making Incremental Dental Positioning Adjustment Appliances Made Therefrom and Methods of Making the Same*, Inv. No. 337-TA-833, at 14-15 (May 6, 2013) (Initial Determination)

It is well settled the scope of section 337 is broad enough to prevent every type and form of unfair practice. Software is useful only if it is reduced to an electronic form. Consequently, in applying the cease and desist order to respondents' software when it is transferred in electronic form . . . , we are simply preventing the transfer of the infringing software in the very [sic] from in which it is executed by the computer. (internal quotation marks omitted).

Id.

²⁰⁹ *Id.* at 20 ("[T]he issue is not whether or not the asserted claims are valid Rather, the question is whether or not digital data sets are articles.") (internal quotation marks omitted).

²¹⁰ *Id.* (dismissing the respondents' arguments relying on § 101 as impermissibly new

An accused article can only infringe a valid and enforceable patent if it would be itself eligible for patent protections, avoiding issues of novelty, non-obviousness, and usefulness.²¹¹ In other words, an “article” directly infringing a patent is, at a minimum, a process, manufacture, machine, or composition of matter.²¹² Such an interpretation of “article” provides the ITC with broad authority over the vast expanse of patentable subject matter that today includes intangible goods.²¹³ While this logical reasoning may seem to place every man-made good under the Sun²¹⁴ within the ITC’s jurisdiction, the modern doctrines of patent eligibility define a palpable reach for the term “article.”

1. Patent Eligible Subject Matter

Patent eligible subject matter under § 101 entails “any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof.”²¹⁵ Historically, patentable subject matter has steadily progressed from the tangible manufactured goods of the Industrial Age, to the business methods and microscopic manufactures descriptive of the Information Age.²¹⁶ However, the flood of technological advancement has often been diverted or dammed by judicial interpretations under § 101 aimed at preserving the patent system’s integrity.²¹⁷

The federal courts have articulated three exemptions under § 101 in an effort to protect the “tools of innovation” from monopolization by a single inventor.²¹⁸ These tools include natural phenomena, laws of nature, and abstract ideas, as patenting these would stifle innovation.²¹⁹ These judicial constructs are

arguments concerning the validity of the complainant’s patents, and inapposite for not determining whether or not software is an article of manufacture).

²¹¹ 35 U.S.C. §§ 101-03 (2012) (‘Inventions Patentable,’ ‘Conditions for patentability; novelty,’ and ‘Conditions for patentability; non-obvious subject matter,’ respectively).

²¹² *Id.* § 271(a) (“[W]hoever without authority makes, uses, offers to sell, or sells any *patented invention*, within the United States or imports into the United States any *patented invention* during the term of the patent thereof, infringes the patent.”) (emphasis added).

²¹³ *See id.* § 101 (“Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent . . .”).

²¹⁴ *Diamond v. Chakrabarty*, 447 U.S. 303, 308-09 (1980) (citing S. REP. NO. 82-1979, at 5 (1952)).

²¹⁵ § 101.

²¹⁶ *Bilski v. Kappos*, 561 U.S. 593, 605 (2010).

²¹⁷ *Id.*

²¹⁸ *Id.* at 601 (citing *Diamond v. Chakrabarty*, 447 U.S. 303 at 309) (“The Court’s precedents provide three specific exceptions to § 101’s broad patent-eligibility principles: laws of nature, physical phenomena, and abstract ideas.”).

²¹⁹ *See id.* (“Congress took this permissive approach to patent eligibility to ensure that ingenuity should receive a liberal encouragement.”) (internal quotations omitted).

best explained in the triplet of *Benson*,²²⁰ *Flook*,²²¹ and *Diehr*,²²² and the quartet of *Bilski*,²²³ *Prometheus*,²²⁴ *Myriad*,²²⁵ and *Alice*.²²⁶

2. *The Triplet: 1972 – 1981*

Periodically, the Supreme Court has revisited patent law and attempted to remedy perceived glitches within federal jurisprudence, often with multiple, closely timed decisions.²²⁷ Section 101, as the threshold question for patent protections, is often a target of the Supreme Court's scope.²²⁸ When addressing patent eligibility concerns in *Bilski v. Kappos*, the Court redirected analyses under § 101 to the judicial exemptions as articulated under three precedential guideposts: *Benson*, *Flook*, and *Diehr*.²²⁹

a. *Gottschalk v. Benson* and *Parker v. Flook*

The first two lines of the triplet arise from attempted claims to mathematical formulas that are “abstract intellectual concepts . . . [that] are the basic tools of scientific and technological work.”²³⁰ In *Gottschalk v. Benson*, a patent applicant had claimed a method of converting binary-coded decimal numerals into pure binary numerals using a mathematical algorithm on a general-use com-

²²⁰ *Gottschalk v. Benson*, 409 U.S. 63 (1972).

²²¹ *Parker v. Flook*, 437 U.S. 584, 586 (1978).

²²² *Diamond v. Diehr*, 450 U.S. 175 (1981).

²²³ *Bilski*, 561 U.S. at 593.

²²⁴ *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289 (2012).

²²⁵ *See generally* Ass'n for Molecular Pathology v. Myriad Genetics, Inc., 133 S. Ct. 2107 (2013).

²²⁶ *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, No. 13-298, slip op. at 7-14 (2014). It should be noted that there are other cases that have been important to defining patentable subject matter under § 101. *See, e.g.*, *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 130 (1948); *Diamond v. Chakrabarty*, 447 U.S. 303, 305 (1981); *State Street Bank & Trust Co. v. Signature Fin. Grp., Inc.* 149 F.3d 1368, 1370 (1999).

²²⁷ *See, e.g.*, *Gottschalk v. Benson*, 409 U.S. 63 (1972); *Parker v. Flook*, 437 U.S. 584 (1978); 450 U.S. at 175. These three pivotal patent law cases were decided in a five-year span between 1972-1981. *See also* 561 U.S. at 593; *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S.Ct. 1289 (2012); *Ass'n for Molecular Pathology*, 133 S. Ct. at 2107; *Alice Corp. Pty. Ltd.*, No. 13-298 at 1. Four more significant patent law decisions took place in the five-year span between 2010-2014.

²²⁸ *See, e.g.*, *Gottschalk*, 409 U.S. at 64; *see also Parker*, 437 U.S. at 588; *see also* 450 U.S. at 177.

²²⁹ Prior to *Bilski*, the Federal Circuit had advocated use of the Machine-or-Transformation (“MOT”) test for analyses under § 101. The MOT test requires that for a claimed process to be patent-eligible, it must be “tied to a particular machine or apparatus, or transforms a particular article into a different state or thing.” *Bilski*, 561 U.S. at 593.

²³⁰ *Gottschalk*, 409 U.S. at 67.

puter.²³¹ The Supreme Court found the applicant's claims would cover both known and unknown applications of the mathematical algorithm, which the Court believed had no other substantial use besides in conjunction with a general use computer.²³² Similarly, in *Parker v. Flook*, a patent applicant claimed a process for updating the alarm limits²³³ based on current conditions during catalytic conversion in the petrochemical and oil-refining industry.²³⁴ Considering the mathematical algorithm as if it were well-known, the Court found the claimed process was comparable to an unpatentable claim on solely calculating a wheel's circumference using $2 \times \pi \times \text{radius}$.²³⁵ The Court, however, left the gates open for some inventive applications of the judicial exemptions to be eligible for patent protections.²³⁶

b. Diamond v. Diehr

The third and final line of the triplet also arises from a patentee's claim involving a mathematical algorithm, but concludes with a distinct result.²³⁷ In *Diamond v. Diehr*, the Supreme Court's third guidepost, a patentee attempted to claim a "process for molding raw, uncured synthetic rubber into cured precision products" using a computer-implemented mathematical algorithm for determining the necessary timeframe.²³⁸ The algorithm used in determining the necessary time for curing was the Arrhenius equation, a well-known formula traditionally used in calculations for rubber-molding processes.²³⁹ However, the Court concluded that the claimed process was patentable, stating the applicant merely sought protections for an inventive process for curing rubber that incorporated the Arrhenius equation.²⁴⁰ The Court reasoned that the patentee's claims would only foreclose use of the abstract intellectual concept in conjunc-

²³¹ *See id.* at 64.

²³² *Id.* at 68.

²³³ *See Parker*, 437 U.S. at 585

An 'alarm limit' is a number. During catalytic conversion processes, operating conditions such as temperature, pressure, and flow rates are constantly monitored. When any of these 'process variables' exceeds a predetermined 'alarm limit,' an alarm may signal the presence of an abnormal condition indicating either inefficiency or perhaps danger. Fixed alarm limits may be appropriate for a steady operation, but during transient operating situations, such as start-up, it may be necessary to 'update' the alarm limits periodically.

Id.

²³⁴ *Id.* at 586.

²³⁵ *Id.* at 595.

²³⁶ *Id.* at 594.

²³⁷ *Diamond v. Diehr*, 450 U.S. 175, 192 (1981).

²³⁸ *Id.* at 175.

²³⁹ *Id.* at 177 n.2.

²⁴⁰ *Id.* at 192-93.

tion with the other claimed steps that transformed the rubber, and was thus permissible.²⁴¹

3. *The Quatrain: 2010 – 2014*

Excluding the creation of the United States Court of Appeals for the Federal Circuit²⁴² and a handful of major cases addressing equivalence,²⁴³ claim construction,²⁴⁴ and business methods,²⁴⁵ all was relatively quiet on the judicial front of patent eligibility. However, in 2009, the Supreme Court began drafting a precedential quatrain of cases to repair § 101 in light of nearly thirty years of jurisprudence and technological advancement.²⁴⁶

a. Bilski v. Kappos

The first line of the Supreme Court's recent quatrain demolished the analytical machinery built by the Federal Circuit for filtering patent eligible subject matter.²⁴⁷ In *Bilski v. Kappos*, an applicant claimed a process for hedging²⁴⁸ risk in trading commodities, particularly in the energy industry, that the applicant had reduced to a mathematical formula.²⁴⁹ In the underlying case before the Federal Circuit, the court had concluded the process was ineligible as it failed the machine-or-transformation test, which the court had adopted as the exclusive test for eligibility.²⁵⁰ The Supreme Court maintained that the machine-or-transformation test was a valuable and important clue in determining eligibility under § 101,²⁵¹ yet concluded reliance on that test was more suited for the Industrial Age, rather than the Information Age.²⁵²

²⁴¹ *Id.* at 187.

²⁴² Federal Courts Improvement Act of 1982, Pub. L. No. 97-164, 96 Stat. 26 (codified as amended in scattered sections of 28 U.S.C.).

²⁴³ See *Warner-Jenkins Co., Inc. v. Hilton Davis Chem. Co.*, 520 U.S. 17 (1997); *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., Ltd.*, 535 U.S. 722 (2002).

²⁴⁴ See *Markman v. Westview Instruments, Inc.*, 517 U.S. 370 (1996).

²⁴⁵ See *State Street Bank & Trust Co. v. Signature Fin. Grp., Inc.*, 149 F.3d 1368 (1998).

²⁴⁶ Sue D. Nym, *What Happened to Judge Lourie in CLS Bank v. Alice Corp?*, IP-WATCHDOG (May 15, 2013), <http://www.ipwatchdog.com/2013/05/15/what-happened-to-judge-lourie-in-cls-bank-v-alice-corp/id=40387/>.

²⁴⁷ *Bilski v. Kappos*, 561 U.S. 593, 612 (2010).

²⁴⁸ *Id.* at 611 (quoting Judge Rader's dissent in *In re Bilski*, 545 F.3d 943 (Fed. Cir. 2008), stating "Hedging is a fundamental economic practice long prevalent in our system of commerce and taught in any introductory finance class").

²⁴⁹ *Id.* at 599.

²⁵⁰ *Id.* at 604.

²⁵¹ *Id.*

²⁵² *Id.* at 605; see *CLS Bank Int'l v. Alice Corp. Pty. Ltd.*, 717 F.3d 1269, 1281 (2013), *cert. granted*, 134 S. Ct. 734 (2013) and *aff'd*, 134 S. Ct. 2347 (2014)

Bright-line rules may be simple to apply, but they are often impractical and counter-

As the Supreme Court explicated, inventions are no longer solely “grounded in a physical or other tangible form,” but include intangible innovations such as “software, advanced diagnostic medicine techniques, and inventions based on linear programming, data compression, and the manipulation of digital signals.”²⁵³ Thus, the Supreme Court redirected eligibility analysis back to the judicial exemptions, highlighting *Benson*, *Flook*, and *Diehr* as important guideposts in threshold questions under § 101.²⁵⁴ In balancing the newly-articulated triplet, the Court concluded the claimed process of hedging risk was most similar to the ineligible methods claimed in *Benson* and *Flook*, and would foreclose a basic concept of commerce from use by other innovators.²⁵⁵

b. Mayo Collaborative Services v. Prometheus Laboratories, Inc.

The second and third lines of the Supreme Court’s judicial prose addressed the patentability of medical advancements.²⁵⁶ In *Mayo Collaborative Services v. Prometheus Laboratories, Inc.*, an applicant claimed a method for determining the most safe and efficacious dosage of a drug used in treating autoimmune disease based on the presence of certain metabolites in the patient’s bloodstream.²⁵⁷ The claimed method required a physician to (1) administer the drug, (2) measure the presence of metabolites, (3) compare measured levels with charted levels correlating to the drug’s safety and efficacy, and (4) adjust dosage accordingly.²⁵⁸ The Supreme Court held the claimed method was ineligible, as the method solely comprised an uninventive application of “well-understood, routine, conventional activity” to a law of nature, specifically the scientific relationship between the metabolite and the drug.²⁵⁹ The Court stressed, however, that inventive applications of the judicial exemptions could be afforded patent protections, depending on whether the “patent in practice amounts to significantly more than a patent upon the natural law itself.”²⁶⁰

productive when applied to § 101. Such rules risk becoming outdated in the face of continual advances in technology—they risk ‘freez[ing] process patents to old technologies, leaving no room for the revelations of the new, onrushing technology.’ (quoting *Gottschalk v. Benson*, 409 U.S. 63, 71 (1972)).

²⁵³ *Bilski*, 561 U.S. at 605.

²⁵⁴ *Id.* at 609.

²⁵⁵ *Id.* at 611-12.

²⁵⁶ *See Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S.Ct. 1289, 1294 (2012).

²⁵⁷ *Id.* at 1295.

²⁵⁸ *Id.*

²⁵⁹ *Id.* at 1299.

²⁶⁰ *Id.* at 1294.

c. *Association of Molecular Pathology v. Myriad Genetics, Inc.*

The third line depicts the continued struggle between biomedical advancement and the patent system as technology and natural phenomena become increasingly indistinguishable, and illustrates how the Court intends to address technology beyond their understanding.²⁶¹ In *Association of Molecular Pathology v. Myriad Genetics*, an applicant laid claim to isolated DNA segments as well as synthetic complementary-DNA (cDNA), each correlating to two human genes used in detecting individualized risk for breast cancer.²⁶² The Court concluded the isolated DNA segments were ineligible natural phenomena merely “isolated from the surrounding [natural] genetic material.”²⁶³

Conversely, the Court held the cDNA sequences lacking non-coding introns²⁶⁴ were eligible for patent protections, as “the lab technician unquestionably creates something new when cDNA is made.”²⁶⁵ According to the Court, despite that the claimed cDNA sequences only contained information dictated by natural DNA and that genes and their information are unpatentable, the applicant’s cDNA was “distinct from the [natural] DNA from which it was derived.”²⁶⁶ Thus, the claimed cDNA amounted to significantly more than the natural phenomenon itself.²⁶⁷

d. *Alice Corp. v. CLS Bank*

The fourth and most recent line of the quatrain polishes the analytical framework the Court has tried to articulate for § 101 with respect to the “law of nature” exception to patent eligibility.²⁶⁸ In *Alice Corporation v. CLS Bank*, an applicant claimed a method for mitigating transactional risks surrounding financial lending through use of a third party intermediary, where the method

²⁶¹ See *Ass’n for Molecular Pathology v. Myriad Genetics, Inc.*, 133 S. Ct. 2107, 2111 (2013); see also *id.* at 2120 (Scalia, J., concurring) (“I join the judgment of the Court, and all of its opinion except Part I–A and some portions of the rest of the opinion going into fine details of molecular biology. I am unable to affirm those details on my own knowledge or even my own belief.”).

²⁶² *Id.* at 2110-11.

²⁶³ *Id.* at 2120.

²⁶⁴ DNA is comprised of nucleotide sequences that can be separated into exons and non-coding introns. Exons correspond to particular amino acids, which are the building blocks of proteins. The biological machinery of the cell, specifically ribosomes, use the sequence of exons to construct certain proteins. The non-coding introns are the nucleotide sequences of the DNA segment that are in between the exons and do not participate in protein synthesis as they are removed during the early steps of transcription. See *id.* at 2111-12.

²⁶⁵ *Id.* at 2119.

²⁶⁶ *Id.*

²⁶⁷ See *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1294 (2012) (discussing “inventive concept” under § 101).

²⁶⁸ *Alice Corp. Pty. Ltd. v. CLS Bank Int’l*, No. 13-298, slip op. at 5 (2014).

was implemented on a general-use computer.²⁶⁹ The Court seized the opportunity to rearticulate the analytical framework presented under *Prometheus* as follows: (1) “determine whether the claims at issue are directed to one of [the] patent-ineligible concepts,” and (2) search for an “inventive concept . . . ensur[ing] that the patent in practice amounts to significantly more than a patent on the [ineligible concept] itself.”²⁷⁰

Applying the rearticulated framework, the Supreme Court determined the claimed method was directed to the abstract idea of intermediated settlement that is a “fundamental economic practice long prevalent in our system of commerce.”²⁷¹ However, reliance on an abstract idea does not alone render an invention ineligible, as “all inventions . . . embody, use, reflect, rest upon, or apply [the patent ineligible concepts]” and new and useful applications of those concepts are patently eligible.²⁷² The Court ultimately held the method’s reliance on a generic computer and mere application of otherwise conventional functions did not amount to an inventive concept that transformed the abstract concepts into patentable subject matter.²⁷³

C. The Pentagon: Fortifying Certain Articles with ITC Protections

Patent infringement and subject matter eligibility provide an otherwise amorphous collection of goods and products with five distinct boundaries from which to define the perimeter of permissible ITC protection under Section 337.²⁷⁴ Together, the five sides form a pentagon around the term “article.”

²⁶⁹ *Id.* at 2-3

In particular, the claims are designed to facilitate the exchange of financial obligations between two parties by using a computer system as a third-party intermediary. The intermediary creates ‘shadow’ credit and debit records (*i.e.*, account ledgers) that mirror the balances in the parties’ real-world accounts at ‘exchange institutions’ (*e.g.*, banks). The intermediary updates the shadow records in real time as transactions are entered, allowing ‘only those transactions for which the parties’ updated shadow records indicate sufficient resources to satisfy their mutual obligations.’ At the end of the day, the intermediary instructs the relevant financial institutions to carry out the ‘permitted’ transactions in accordance with the updated shadow records, thus mitigating the risk that only one party will perform the agreed-upon exchange.

Id.

²⁷⁰ *Id.* at 7. The second step can also be described as follows: “[W]e then ask, ‘[w]hat else is there in the claims before us?’ To answer that question, we consider the elements of each claim both individually and ‘as an ordered combination’ to determine whether the additional elements ‘transform the nature of the claim’ into a patent-eligible application.” *Id.*

²⁷¹ *Id.* at 9.

²⁷² *Id.* at 6.

²⁷³ *Id.* at 13-14; *Cf.* *Bilski v. Kappos*, 130 S.Ct. 3218, 3234 (2010) (similarly, the Court held that patents directed to an abstract idea are not patentable).

²⁷⁴ 35 U.S.C. § 271(a)-(e) (2012) (the statute defines different types of infringements on articles).

1. Direct and Indirect Infringement

The first two sides result from two forms of infringement, direct and indirect, as an article must infringe a domestic patent for it to be afforded ITC protections, specifically those that arise from § 1337(a)(1)(B)(i).²⁷⁵ An article directly infringes a patent if it embodies all the limitations of the claimed invention, either literally or equivalently.²⁷⁶ Comparatively, an article involved in indirect infringement is a component that is either utilized in actively inducing another to unlawfully produce the claimed invention, or has no substantial use apart from combination with other components to unlawfully form the claimed invention.²⁷⁷ While seeking damages for contributory or induced infringement based upon certain components may be excessively burdensome or impractical,²⁷⁸ such considerations are inconsequential in defining “article.”²⁷⁹

2. Natural Phenomena, Laws of Nature, and Abstract Ideas

The other three sides result from the judicial exemptions under § 101.²⁸⁰ For an article to infringe a valid and enforceable patent, the article must itself be eligible for patent protections.²⁸¹ The judicial exemptions further confine the amorphous collection of goods in the negative, as “natural phenomena, and laws of nature are not eligible for patent protection.”²⁸² Natural phenomena, laws of nature, and abstract ideas are not subject to exclusions under Section 337, as these comprise the “tools of innovation” afforded to all mankind irrespective of international borders.²⁸³

Albeit in pursuit of legislative economy, § 101 was meant to be a “dynamic provision designed to encompass new and unforeseen inventions.”²⁸⁴ In the beginning, software was predominantly copyrighted as an author’s unique composition fixed in a tangible medium, as software was considered nothing more than an abstract idea.²⁸⁵ Nevertheless, modern software possessing novel

²⁷⁵ 19 U.S.C. § 1337(a)(1)(B)(i) (2012).

²⁷⁶ § 271(a).

²⁷⁷ *Id.* § 271(b)-(c).

²⁷⁸ Holbrook & Osborn, *supra* note 158, at 22, 24-25.

²⁷⁹ *Id.* at 11.

²⁸⁰ 2106 Patent Subject Matter Eligibility, USPTO.GOV, <http://www.uspto.gov/web/offices/pac/mpep/s2106.html> (last visited Jan. 21, 2015).

²⁸¹ *Id.*

²⁸² *Id.*

²⁸³ *Gottschalk v. Benson*, 409 U.S. 63, 67 (1972).

²⁸⁴ *Bilski v. Kappos*, 561 U.S. 593, 605 (2010).

²⁸⁵ *Copyright of Computer Programs*, DIGITAL L. ONLINE, <http://digital-law-online.info/lpd1.0/treatise17.html> (last visited Jan. 21, 2015) (one of the first issues concerning copyright of abstract ideas was the piano roll, which the current law at the time stated could not be copyrighted).

processes or producing unique graphic user interfaces is very commonly afforded patent protections.²⁸⁶ Modern patent protections are no longer reserved for tangible goods as advancements in technology have produced new, useful, nonobvious products unrestricted by physicality.²⁸⁷

When discussing the patentability of business methods, the Supreme Court stated that, “[t]echnology and other innovations progress in unexpected ways,” and the courts should not be captive to eligibility standards more suited for the Industrial Age, rather than the Information Age.²⁸⁸ Otherwise, the patent system would not effectively promote the useful arts and sciences.²⁸⁹ Unfortunately, the broad standard under § 101 incidentally created an amorphous landscape surrounding patent eligibility that required judicial intervention.²⁹⁰ Similarly, the broad nature of the term “article” under Section 337 has created a treacherous battlefield for even the ITC to traverse and requires some form of denotative intervention.²⁹¹

IV. RECOMMENDATIONS

The recommended strategy for combatting the invasion of infringing digital renderings into domestic industries comprises three campaigns: administrative, legislative, and judicial.

A. Administrative

The ITC and CBP will be at the front lines in the coming war between international digital importers and domestic patent holders, and must be the initial focus of any reform effort.

1. Federal Rule Making

When creating the modern iteration of Section 337, Congress intended to provide the ITC with broad authority in protecting domestic industries’ intellectual property.²⁹² The previous statute was limited only to manufactured goods in domestic industries threatened by substantial injury from unfair import prac-

²⁸⁶ *Id.*

²⁸⁷ *Id.*

²⁸⁸ *Bilski*, 561 U.S. at 605.

²⁸⁹ U.S. CONST. ART. I, § 8, cl. 8.

²⁹⁰ *2106 Patent Subject Matter Eligibility*, *supra* note 280.

²⁹¹ *Id.*

²⁹² The Omnibus Trade and Competitiveness Act, Pub. L. 100-418, 102 Stat. 1107 (1988) (the act lays out important definitions describing business and trade).

tices and only protected industries relying on investments in factories, equipment, and labor.²⁹³

The Omnibus Trade and Competitiveness Act of 1988 expanded ITC protections to domestic industries that rely on substantial investments in licensing, development, and engineering,²⁹⁴ and maintained the statute's ability to adapt to technological advancements by leaving "articles" undefined.²⁹⁵ However, ascertaining what is protected under the trade statute cannot be overly burdensome, as it would be unclear whether domestic intellectual property holders with "adequate protection against foreign companies violating such rights."²⁹⁶

The ITC should promulgate a rule amending the federal regulations governing adjudication and enforcement under Section 337 by the ITC.²⁹⁷ The proposed rule should first target 19 CFR § 210.3, which provides definitions for ambiguous terms used in the accompanying provisions.²⁹⁸ The proposed language should state, "*Article* means a tangible or intangible good." Such language provides enough ambiguity to allow for efficient adaptation to technological advancements, while explicitly providing the ITC with authority to police violations of Section 337 involving digital data.

The promulgated rule should also amend the federal regulations governing the ITC's pleadings requirements, specifically 19 CFR § 210.12, to reflect the expansion of ITC jurisdiction explicitly over digital data. For instance, amendment of § 210.3 would require amendment of § 210.12(a)(9), which provides the pleading requirements for a complaint based upon infringement of a valid and enforceable patent.²⁹⁹ The necessary revision would require a factual showing supporting allegations of contributory infringement involving intangible articles such as digital renderings. The most efficient means for accommodating this change would be to add a new § 210.12(a)(9)(ix) stating,

When relying on contributory infringement, a showing that each person named as violating Section 337 of the Tariff Act is importing or selling the article that embodies a material part of the invention claimed by the U.S. patent, is not a staple good, and has no substantial non-infringing use.

The subsequent provisions within § 210.12(a)(9) would be renumbered accordingly. This particular revision to § 210.12(a)(9) accommodates cases involving digital data and ensures adjudicative economy by requiring specific information for the administrative law judge at the onset of litigation. Even if

²⁹³ H.R. 4848, 100th Cong. (1999), THE LIBR. OF CONG., <http://thomas.loc.gov/cgi-bin/bdquery/z?d100:HR04848:@@L&summ2=m&> (last visited Jan. 21, 2015).

²⁹⁴ *Id.*

²⁹⁵ *See, e.g.*, The Omnibus Foreign Trade and Competitiveness Act, Pub. L. 100-418, 102 Stat. 1107 (1988).

²⁹⁶ *Id.* at 1211-12.

²⁹⁷ *See* 19 C.F.R. § 210.3 (2014).

²⁹⁸ *Id.*

²⁹⁹ *Id.* § 210.12(a)(9).

the ITC's equitable remedies are unenforceable absent CBP reform, adjudication by the ITC provides a necessary path for domestic patent holders to subsequently seek significant monetary damages against foreign infringers who continue to engage in unfair trade practices and violate valid and enforceable patents.³⁰⁰

2. Collaboration with Internet Service Providers

CBP can mitigate the necessity for increased litigation by domestic patent holders by implementing programs to police electronic transmissions.³⁰¹ Unfortunately, due to the virtual nature of digital data, infringing digital renderings easily evade CBP officers by lacking a physical anchor such as a compact disc or hard drive.³⁰² In the case of the digital renderings, even if the ITC were to provide traditional remedies preventing importation of infringing software fixed to a tangible medium, these exclusions could be easily circumvented through electronic transmission across international borders via the Internet.³⁰³

CBP should collaborate with Internet Service Providers to monitor international Internet traffic and enforce exclusion orders against infringing articles attempting to enter domestic industries under the radar. In response to increasing digital piracy of copyrighted materials, especially music and other audio recordings, some have advocated for CBP to begin policing electronic transmissions via the Internet for pirated digital files.³⁰⁴ While surveillance of Internet traffic by government agencies poses a threat to individual privacy and free speech, advocates argue that monitoring Internet traffic has become necessary to protect copyright holders given society's increased reliance on Internet pathways for commerce.³⁰⁵ Similarly, a partnership with Internet Service Providers to monitor international Internet traffic for infringing digital data would increase protections for domestic industries against electronically transmitted articles infringing valid and enforceable patents.³⁰⁶ Further, to alleviate privacy

³⁰⁰ 19 U.S.C. § 1337 (2012).

³⁰¹ Andrew Haberman, *Policing the Information Super Highway: Customs' Role in Digital Piracy*, 2 AM. U. INTELL. PROP. BRIEF 17, 18, 21 (2010) (discussing the resources available to CBP to fight digital piracy).

³⁰² *Id.* at 21 (discussing the resources available to CBP to fight digital piracy).

³⁰³ Nick Bilton, *Internet Pirates will Always Win*, N.Y. TIMES (Aug. 4, 2012), http://www.nytimes.com/2012/08/05/sunday-review/internet-pirates-will-always-win.html?_r=0.

³⁰⁴ Haberman, *supra* note 301, at 20.

³⁰⁵ Douglas Rushkoff, *Will Your Internet Provider be Spying on You?*, CNN (July 06, 2012), <http://www.cnn.com/2012/07/06/opinion/rushkoff-online-monitoring/>.

³⁰⁶ Kurt Opsahl & Carolina Rossini, *TPP Creates Legal Incentives for ISPs to Police the Internet*, ELECTRONIC FRONTIER FOUND. (Aug. 24, 2012), <https://www.eff.org/deeplinks/2012/08/tpp-creates-liabilities-isps-and-put-your-rights-risk>.

and free speech concerns, CBP should prevent abuse by concurrently implementing an extensive and transparent oversight procedure comprising explicit monitoring limitations, periodic destruction of metadata, and protections for accused violators.

B. Legislative

An alternative to the administrative actions is congressional action through legislation to protect domestic articles.³⁰⁷ For example, § 271(f), an infringement provision similarly policing circumvention of domestic patents by componentization, was enacted in response to the Supreme Court's holding in *Deepsouth Packing Co. v. Laitram Corporation*.³⁰⁸ In *Deepsouth*, the Supreme Court held that an infringer was not prohibited from making the components of a patented deveining machine, and assembling them overseas for subsequent sale and use abroad.³⁰⁹ In light of the Supreme Court's ruling, Congress enacted § 271(f) to "expand[] the definition of infringement to include supplying from the United States a patented invention's components."³¹⁰ Similarly, Congress should enact legislation in response to another unforeseen form of indirect infringement, specifically circumvention relying on digital renderings.

1. Proposed Amendment to § 1337(m)

Mimicking the actions of Congress following the *Deepsouth* decision,³¹¹ Congress should enact legislation specifically defining "article" under Section 337 as specifically inclusive of intangible articles. Section 1337(m) currently states:

(m) Definitions

(1) For purposes of this section and sections 1338 and 1340 of this title, the term "United States" means the customs territory of the United States as defined in general note 2 of the Harmonized Tariff Schedule of the United States.³¹²

To combat infringing digital data and maintain the term's dynamic properties, Congress should enact legislation that amends this section to state:

(2) For the purposes of this section and § 1332, 1336, and 1338 of this title, the term "article" shall include intangible goods, such as digital renderings and other digital data.

³⁰⁷ See, e.g., The Buy American Act, 41 U.S.C. § 8302(a)(1) (2011).

³⁰⁸ *Deepsouth Packing Co. v. Laitram Corp.*, 406 U.S. 518, 531 (1972).

³⁰⁹ *Id.* at 525-26. The Supreme Court concluded that the infringing activity was not prohibited under either form of indirect infringement. *Id.* at 526-27.

³¹⁰ *Microsoft Corp. v. AT&T Corp.*, 550 U.S. 437, 444-45 (2007).

³¹¹ 406 U.S. at 531.

³¹² 19 U.S.C. § 1337(m) (2012).

Such a statute would be limited to infringing digital data and infringing intangible products, since infringement requirements under Section 337 would continue to be imputed on to the term “article.”³¹³

2. Introduction with Trade Promotion Authority Legislation

This proposed amendment to Section 337 could easily be included within the trade promotion authority legislation currently being debated within Congress.³¹⁴ The trade promotion authority, or “fast track,” is the ability of the President to receive congressional ratification of an international trade agreement without amendment or filibuster in exchange for congressional involvement in negotiations.³¹⁵

This authority most recently appeared in the proposed Bipartisan Congressional Trade Priorities Act of 2014 that would renew the trade promotion authority, update negotiating objectives, and strengthen existing U.S. laws.³¹⁶ The legislation would specifically include “objectives to facilitate digital trade, including through protections for cross-border data flows, and to recognize the significance of the Internet in international commerce.”³¹⁷

As of May 2015, Congress has not passed legislation providing the Obama Administration with trade promotion authority. However, members of the Senate Finance Committee and the House Ways and Means Committee have been collaborating on updated legislation granting trade promotion authority and introduced the Bipartisan Congressional Trade Priorities and Accountability Act of 2015 (H.R. 1890), which includes broad trade negotiating objectives targeting digital goods and services, as well as cross-border data flows.³¹⁸ In-

³¹³ See, e.g., Omnibus Foreign Trade and Competitiveness Act, Pub. L. 100-418, 102 Stat. 1107 (1988).

³¹⁴ William Mauldin, *Top Senate, House Lawmakers Nearing Deal on Trade Promotion Authority*, WALL ST. J. (Feb. 20, 2015, 7:04 PM), <http://www.wsj.com/articles/top-senate-house-lawmakers-nearing-deal-on-trade-promotion-authority-1424467559>.

³¹⁵ *Id.*

³¹⁶ *Overview of the Bipartisan Congressional Trade Priorities Act of 2014*, SENATE FIN. COMMITTEE & WAYS AND MEANS COMMITTEE 1-2, <http://www.finance.senate.gov/imo/media/doc/TPA%20One%20Pager.pdf> (last visited Apr. 03, 2015).

³¹⁷ *Trade Promotion Authority Bill Introduced in House and Senate*, SANDLER, TRAVIS & ROSENBERG (Jan. 10, 2014), <http://www.strtrade.com/news-publications-trade-promotion-authority-legislation-011014.html>.

³¹⁸ Eric R. Rock & Benjamin H. Shanbaum, *A Week of Trade: Congress Advances Numerous Trade Bills*, THE NAT'L L. REV., (Apr. 27, 2015), <http://www.natlawreview.com/article/week-trade-congress-advances-numerous-trade-bills>; H.R.1890 – *Bipartisan Congressional Trade Priorities and Accountability Act of 2015*, CONGRESS.GOV, <https://www.congress.gov/bill/114th-congress/house-bill/1890?q=%7B%22search%22%3A%5B%22trans-pacific%22%5D%7D> (last visited May 13, 2015).

cluding an amendment to the final bill expanding the definition of article under Section 337 to explicitly include intangible goods would facilitate this goal.

C. Judicial

According to the Supreme Court, § 101 was meant to be a “dynamic provision designed to encompass new and unforeseen inventions” in concurrence with the pursuit of legislative economy.³¹⁹ When discussing the patentability of business methods, the Court stated that, “Technology and other innovations progress in unexpected ways,” and the courts should not be captive to eligibility standards more suited for a different era.³²⁰

Unfortunately, the broad standard under § 101 has incidentally created an amorphous landscape surrounding patent eligibility that has been unsuccessfully resolved by the federal courts on multiple occasions.³²¹ Similarly, the broad nature of the term “article” under Section 337 has created a treacherous battlefield for even the ITC’s defending army.³²²

1. *cDNA as a Template*

In *Association of Molecular Pathology v. Myriad Genetics, Inc.*, the Supreme Court held naturally-occurring DNA was ineligible for patent protections under § 101’s natural phenomena exemption.³²³ However, the Court unequivocally stated, “[cDNA] is patent eligible under § 101.”³²⁴ Although it would be improper “[categorically] denying patent protection for ‘inventions in areas not contemplated by Congress [and doing so] would frustrate the purposes of the patent law,’”³²⁵ the Supreme Court demonstrated affirmative inclusion is permissible to provide patent protections for new technologies and maintain legislative economy.³²⁶ Similar judicial intervention would provide domestic industries with coverage from infringing digital data, while maintaining legislative economy.

³¹⁹ *Bilski v. Kappos*, 561 U.S. 593, 605 (2010).

³²⁰ *Id.*

³²¹ *See, e.g., id.*

³²² *See, e.g.,* William Dolan, Brief, *The International Trade Commission: Potential Bias, Hold-Up, and the Need for Reform*, 11 *Duke L. & Tech. Rev.*, at ¶ 6 (2009).

³²³ *Ass’n for Molecular Pathology v. Myriad Genetics, Inc.*, 133 S. Ct. 2107, 2117 (2013).

³²⁴ *Id.* at 2119.

³²⁵ *Bilski*, 561 U.S. at 605.

³²⁶ *Id.*

2. *Upcoming Opportunities with Suprema, Inc. v. ITC*

The Supreme Court may have the opportunity to actively define article in the near future as the Federal Circuit recently reheard *Suprema, Inc. v. ITC* earlier this year.³²⁷ The Federal Circuit's en banc decision will likely provide the court's interpretation of infringing articles under § 1337(a)(1)(B)(i) as well as the scope of the ITC's authority over induced infringement.³²⁸ If the Federal Circuit again finds in favor of the foreign importer, the case could come before the Supreme Court and provide the necessary opportunity for judicial intervention.

Upon granting the petitioner's writ of certiorari, the Supreme Court should find that the ITC may predicate equitable remedies on findings of induced infringement, including use of intangible goods such as software to create a patented invention. The Supreme Court should explicitly state that "articles that – infringe" under Section 337 includes intangible goods such as software and other electronically-transmitted digital data. Similar to the explicit inclusion of cDNA by the Court, the explicit inclusion of digital data will provide ITC protections for intangible technological advancements and maintain the statute's breadth and adaptability.

V. CONCLUSION

Three-dimensional printing has the potential to be history repeating itself.³²⁹ The Great War was the war to end all wars as it encapsulated all of Europe and the majority of the then modern world in armed conflict.³³⁰ Dueling alliances engaged in territorial and influential expansion, created a powder keg that ignited with the assassination of Archduke Franz Ferdinand in 1914,³³¹ and resulted in one of the bloodiest wars in modern history.³³² However, territorial expansion would begin anew and international alliances would resurface with

³²⁷ Aarti Shah & Nick Armington, *CAFC to Rehear Suprema: Disposition Could Have Significant Repercussions for ITC Jurisdiction*, MINTZ LEVIN (Nov. 26, 2014), http://www.globalipmatters.com/2014/11/26/cafc-rehears-suprema-potential-for-significant-repercussions-for-itc-complaints?utm_source=Mondaq&utm_medium=syndication&utm_campaign=View-Original.

³²⁸ See 19 U.S.C. § 1337(a)(1)(B)(i) (2012).

³²⁹ Phyllis Korkki, *Beyond 3-D Printers' Magic, Possible Legal Wrangling*, N.Y. TIMES (Nov. 23, 2013), <http://www.nytimes.com/2013/11/24/business/beyond-3-d-printers-magic-possible-legal-wrangling.html>.

³³⁰ Gary Sheffield, *The Origins of World War One*, BBC (Mar. 08, 2011), http://www.bbc.co.uk/history/worldwars/wwone/origins_01.shtml.

³³¹ *Id.*

³³² *Id.*

an enamored German people following a charismatic leader.³³³ Europe, and the world, again found themselves at war.³³⁴

The conflicts between domestic patent holders and foreign importers over the use of three-dimensional printing to circumvent patents bears striking resemblance to the conflicts between file-sharing networks and copyright holders at the advent of the Internet.³³⁵ Copyright law was significantly corrupted by widespread infringement and piracy, and posthumous actions have been nothing but vain appeals at the already-determined fate of copyright.³³⁶

The United States must take preemptive measures through administrative, legislative, or judicial means to ensure that domestic intellectual property holders are protected from the coming invasion of infringing digital data for use with household three-dimensional printers. Section 337 arguably covers unfair competition involving intangible goods, but administrative and judicial courts alike conflict as to the proper scope of the term “article.” The Information Age requires that “article” must be interpreted broadly, and as inclusive of intangible goods electronically transmitted via the Internet. Otherwise, intellectual property will find itself in another Great War.

³³³ Martin Kitchen, *The Ending of World War One, and the Legacy of Peace*, BBC (Feb. 17, 2011), http://www.bbc.co.uk/history/worldwars/wwone/war_end_01.shtml.

³³⁴ *Id.*

³³⁵ Korkki, *supra* note 329.

³³⁶ Paul Tassi, *You Will Never Kill Piracy, and Piracy Will Never Kill You*, FORBES (Feb. 3, 2012, 10:20 AM), <http://www.forbes.com/sites/insertcoin/2012/02/03/you-will-never-kill-piracy-and-piracy-will-never-kill-you/print/>.