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STREET SMARTS: THE RACE TO PATENT RIGHTS IN ATHLETIC FOOTWEAR

I. TOTALLY LACED IT: INTRODUCING INTELLIGENT FOOTWEAR

As society sprints into the future and companies sweat to keep up with technological advances, athletic brands are turning their focus to intelligent footwear for athletes.¹ Intelligent footwear can improve athlete training and performance by providing biometric feedback to the wearer regarding speed, muscle motion, gait, and location.² Intelligent footwear design incorporates mobile app software to provide easily accessible information to the wearer.³ Athletic brands are patenting intelligent footwear systems hoping to get a head start in the intelligent footwear market.⁴ Unfortunately, patents containing broad claims or abstract ideas can result in a monopoly that can hurt a healthy marketplace.⁵ An abundance of utility patents for intelligent footwear systems to one or two athletic brands can cause more than a limited monopoly and harm the progress of science and free competition.⁶ Design patents, trademarks,

1. See *Top 8 Sports Tech Trends & Innovations in 2023*, STARTUS INSIGHTS, <https://www.startus-insights.com/innovators-guide/sports-tech-trends/> [https://perma.cc/84CR-3SM9] (last visited Feb. 23, 2023) (listing performance analytics as one of top eight sports technology trends for 2022). “Wearables such as data tracking wristbands, equipment embedded sensors, and smart clothes offer precise information about athletes’ actions, force, and accuracy as well as predict injury risks.” See *id.* (noting various wearable athletic equipment).

2. See Jeremy Kaplan, *The Future of Sports: How Biometric Data and A.I. Will Revolutionize Athletics*, DIGITALTRENDS (Feb. 23, 2021), <https://www.digitaltrends.com/health-fitness/sports-biometrics-artificial-intelligence-catapult/> [https://perma.cc/E5UD-VUQK] (explaining biometrics are changing future of athletics by studying body performance for detailed feedback and training). Today sensors exist in all aspects of fitness clothing, accessories, and even footwear. See *id.* (discussing prevalence of biometrics and biosensors in society today); see also Kelly Hodgkins, *Form’s AR Goggles Help Swimmers Keep an Eye on Their Performance*, DIGITALTRENDS (July 9, 2019), <https://www.digitaltrends.com/health-fitness/form-augmented-reality-swim-goggles/> [https://perma.cc/2HEK-8YE5] (illustrating swimming goggles that can track performance for up to sixteen swims with augmented reality display).

3. For further discussion of intelligent footwear design, see *infra* notes 99–120 and accompanying text.

4. For further discussion of intelligent footwear patents, see *infra* notes 99–120 and accompanying text.

5. For further discussion of monopolization, see *infra* notes 30–44 and accompanying text.

6. For further discussion of monopolization, see *infra* notes 30–44 and accompanying text.

and even Non-Disclosure Agreements (“NDAs”) may be safer sources of protection.⁷

This Comment will discuss the validity and effects of utility patent protection for intelligent footwear systems and alternative protection options for athletic brands.⁸ Section II of this Comment will focus on the United States Patent and Trademark Office’s (“USPTO”) patent requirements, patent rights, and the evolution of athletic footwear over the decades.⁹ Section III of this Comment analyzes if utility patents for intelligent footwear can cause a monopoly.¹⁰ Section III also discusses whether design patents, trademarks, and NDAs are better for protecting intelligent footwear.¹¹ Section IV summarizes the Comment.¹²

II. PACING INTO PATENT PROTECTION

Before analyzing the validity of utility patent protection for intelligent footwear, it is important to grasp the fundamental concepts of patent law and the history of athletic footwear.¹³ First, this section explains patent rights and the various requirements for patent registration.¹⁴ Second, it discusses patent infringement.¹⁵ Third, this section outlines the evolution of intelligent athletic footwear over the years.¹⁶

7. For further discussion of alternative options for intellectual property protection, see *infra* notes 171–189 and accompanying text.

8. For further discussion of validity of patent protection for abstract ideas, see *infra* notes 30–44 and accompanying text.

9. For further discussion of patent requirements, see *infra* note 30–61 and accompanying text.

10. For further discussion of abstract ideas, monopolization, and intellectual property protection see *infra* notes 124–155 and accompanying text.

11. For further discussion of abstract ideas, monopolization, and intellectual property protection see *infra* notes 124–155 and accompanying text.

12. For further discussion summarizing the article, see *infra* notes 199–209 and accompanying text.

13. For further discussion of patent law and the history of athletic footwear, see *infra* notes 17–120 and accompanying text.

14. For further discussion of patent rights, see *infra* notes 17–72 and accompanying text.

15. For further discussion of patent infringement, see *infra* notes 73–92 and accompanying text.

16. For further discussion of athletic footwear, see *infra* notes 93–120 and accompanying text.

A. A Leap into Patent Rights

The USPTO grants patents for inventions that are useful, new, and non-obvious.¹⁷ The public policy behind patent protection is to encourage and incentivize new research, scientific development, and technological growth in the United States.¹⁸ The USPTO aspires to strengthen the United States economy by promoting the industrial and technological progress of the nation by granting patents.¹⁹ Patent rights begin on the issuing date of the patent and last until twenty years after the application's filing date in the United States.²⁰ However, patent ownership only provides the right to exclude another's use of the invention in the United States.²¹ Patents

17. See Lawrence M. Sung, *Patent, Copyright, Trade Secret, Right of Publicity, Trademark Handbook for Maryland Business and Litigation Lawyers*, THE MD. STATE BAR ASS'N, INC. (2013) (“[A] U.S. patent may be granted for certain inventions deemed useful, new, and nonobvious as compared to the state of public knowledge”); see also *General Information Concerning Patents*, USPTO (last visited Jan. 10, 2023), <https://www.uspto.gov/patents/basics/general-information-patents> [<https://perma.cc/535C-GKNQ>] (explaining USPTO grants and regulates patents).

18. See Sung, *supra* note 17 (explaining USPTO strives to “facilitate innovation through incentivizing inventors to invent and investors to invest in that inventive activity, by providing the reward of temporary exclusivity to the invention in exchange for a public disclosure of the inventive activity.”).

19. See *General Information Concerning Patents*, *supra* note 17 (“Through the preservation, classification, and dissemination of patent information, the Office promotes the industrial and technological progress of the nation and strengthens the economy.”); see also Simone A. Rose, *Patent “Monopolyphobia”: A Means of Extinguishing the Fountainhead?*, 49 CASE W. RES. L. REV. 509, 523 (1999) (stating patent rights stimulate “competitive research and development (R&D) and brings pioneering inventions to fruition.”).

20. See 35 U.S.C. § 154 (a) (2) (2022) (“[S]uch grant shall be for a term beginning on the date on which the patent issues and ending 20 years from the date on which the application for the patent was filed in the United States”).

21. See *id.* (providing every patent entitles patentee right to “exclude others from making, using, offering for sale, or selling the invention throughout the United States or importing the invention into the United States”); see also Peter S. Menell, Mark A. Lemley, & Robert P. Merges, *Intellectual Property in The New Technological Age: 2019, Volume 1: Perspectives, Trade Secrets and Patents*, CLAUSE 8 PUBLISHING, 163 (2019) (explaining patents do not grant affirmative right to do anything because of blocking patents). Patent holders of improvements on existing patents are barred from using the improvements unless the holder of the broader patent authorizes the use. See *id.* (discussing blocking patents); see also Jeffrey A. Freeman & Stacy Lewis, *Blocking Patents: A Patent Cannot Block Itself*, FINNEGAN LLP (Aug. 20, 2021), <https://www.finnegan.com/en/insights/blogs/prosecution-first/blocking-patents-a-patent-cannot-block-itself.html> [<https://perma.cc/NZC3-4MWA>] (defining blocking patent as “an earlier U.S. patent that prevents practice of a later invention”); Robert D. Gunderman & John M. Hammond, *What is a Patent? The Limited Monopoly*, THE ROCHESTER ENGINEER (Dec. 2005), available at <https://the-limitedmonopoly.com/wp-content/uploads/2015/05/200512LimitedMonopoly-WhatisaPatent.pdf> [<https://perma.cc/NB7K-6NE5>] (“A patent does not grant the inventors or owner the right to use their invention, but instead gives the inventors or owner the right to exclude others from doing so.”).

include a detailed description, claims, drawings, and examples that describe the invention.²² Claims describe the “metes and bounds” of an invention.²³ Consequently, many patent infringement suits result in claim construction of the meaning of a claim in court to determine the ownership rights of a particular patent.²⁴ Design, plant, and utility patents are all available in the United States.²⁵ This Comment will further discuss utility and design patents.²⁶

B. Jumping the Hurdle: Patent Requirements for Utility Patents

This section will explain patent requirements established by the USPTO.²⁷ Patents must have patent-eligible subject matter that is novel and non-obvious, credible utility, and a proper written description.²⁸ The USPTO determines patent eligibility by looking at each patent in light of each requirement.²⁹

1. *Subject Matter*

There is no categorical rule regarding the patentable subject matter in a utility patent.³⁰ However, the USPTO will not grant a patent for any abstract idea, natural law, or physical phenomenon,

22. See MPEP § 1824 (9th ed. Rev. 10, June 2020) (noting claims “shall define the matter for which protection is sought,” be “clear and concise,” and “fully supported by the description”).

23. See *id.* at § 2173.02 (providing claims are used to define “the metes and bounds of the claimed invention”).

24. See *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (holding patent claim language describes boundaries of ownership rights being claimed and what rights patentee is entitled to); *Merrill v. Yeomans*, 94 U.S. 568, 570 (1876) (explaining claims are used to “ascertain precisely” what is patented); see also MPEP § 2173.02 (providing claims can be construed either by USPTO or in court proceedings).

25. See *General Information Concerning Patents*, *supra* note 17 (stating utility patents are granted to anyone who “invents or discovers any new and useful process, machine, article of manufacture, or composition of matter, or any new and useful improvement thereof”). While design patents are granted “to anyone who invents a new, original, and ornamental design for an article of manufacture.” See *id.* (explaining requirements for design patents).

26. See 35 U.S.C. § 101 (2022) (stating utility patents are granted for invention or discovery of any “new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof”); see also *id.* at § 171 (“Whoever invents any new, original and ornamental design for an article of manufacture may obtain a [design] patent therefor . . .”).

27. For further discussion of patent requirements, see *infra* notes 30–61 and accompanying text.

28. For further discussion of patent requirements, see *infra* notes 30–61 and accompanying text.

29. For further discussion of patent eligibility, see *infra* notes 30–61 and accompanying text.

30. See *Bilski v. Kappos*, 561 U.S. 593, 609 (2010) (concluding courts should not adopt categorical rules to determine patentability of business methods because

such as mathematical formulas.³¹ The USPTO may grant a patent for an abstract idea if there is an additional inventive or non-conventional step.³² An inventive step ensures the patent owner cannot monopolize an abstract idea.³³ The patentability of the inventive step relies on if it is well-understood, routine, or conventional apart from the abstract idea.³⁴ Courts address patentable subject matter concerns in the “early stage[s] of litigation . . . to screen out weak patents”³⁵ While the subject matter is impor-

it might have “wide-ranging and unforeseen impacts” and business methods are unpatentable because they are abstract ideas).

31. See *Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980) (holding “laws of nature, physical phenomena, and abstract ideas” are not patentable); *Bilski*, 561 U.S. at 609 (declaring hedging risk is abstract idea because it is mathematical idea); *Gottschalk v. Benson*, 409 U.S. 63, 67 (1972) (“[M]ental processes, and abstract intellectual concepts are not patentable, as they are the basic tools of scientific and technological work.”); see also Elizabeth D. Lauzon, *Patentability Under 35 U.S.C.A. § 101 Which Excludes Laws of Nature, Physical Phenomena, and Abstract Ideas*, 5 A.L.R. Fed. 3d Art. 4 (2015) (citing *KCG Tech., LLC v. CarMax Auto Superstores, Inc.*, 424 F. Supp. 3d 196, 200–205 (D. Mass. 2019)) (explaining smartphone patent that could project onto car screen was abstract idea). The patent had no improvements in computer technology that created a new device or solved a problem. See *id.* (explaining improvement did not include any technological advancement or particular method of achieving idea).

32. See *Alice Corp. Pty. Ltd. v. CLS Bank Int’l*, 573 U.S. 208, 225 (2014) (explaining patented invention did not improve any technology or technical field but was only instruction applying abstract idea using generic computer and thus was not patent-eligible); *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 71 (2012) (holding only adding conventional and general steps that are well-known in art is not enough). The exception for abstract ideas prevents the tie-up of “basic tools of scientific and technological work” and the inhibiting of future innovation. See Sally J.T. Necheles, *Laws of Nature, Natural Phenomena, and Abstract Ideas as Not Patentable*, 20 MICH. CIV. JUR. PATENTS AND INVENTIONS § 12 (April 2023) (explaining courts must distinguish between patents that claim “building blocks of human ingenuity” from patents that “integrate the building blocks into something more” and transfer them into “patent-eligible invention[s]”). *But see id.* (noting simply adding “token postsolution components does not make the concept patentable”).

33. See *Alice*, 573 U.S. at 221 (quoting *Mayo Collaborative Servs. V. Prometheus Labs., Inc.*, 566 U.S. 66, 72 (2012)) (“A [patent] claim that recites an abstract idea must include ‘additional features’ to ensure ‘that the [claim] is more than a drafting effort designed to monopolize the [abstract idea].’”).

34. See *Chamberlain Grp. v. Techtronic Indus. Co.*, 935 F.3d 1341, 1349 (Fed. Cir. 2019) (citing *Mayo*, 566 U.S. at 73) (illustrating inventive ideas are determined by looking at “(1) whether each of ‘the [elements] in the claimed [product] (apart from the natural laws themselves) involve well-understood, routine, conventional activity previously engaged in by researchers in the field, and (2) whether all of the steps ‘as an ordered combination add[] nothing to the laws of nature that is not already present when the steps are considered separately’”); *Intell. Ventures I LLC v. Erie Indem. Co.*, 850 F.3d 1315,1328 (Fed. Cir. 2017) (quoting *Mayo*, 132 S. Ct. at 1298) (holding when applying inventive concept test courts analyze if there are additional features that are more than “well-understood, routine, [and] conventional activity”).

35. See *Menell et al.*, *supra* note 21, at 300 (explaining issuing patents for business methods or other abstract ideas could harm competition and should not be

tant to patent validity, the USPTO examiner must examine the patent by looking at all the patentability requirements together.³⁶

The USPTO can cause patent monopolies by granting patents for laws of nature, natural phenomena, and abstract ideas.³⁷ Dictionaries define a monopoly as the “exclusive control of the market supply of a product or service.”³⁸ A patent monopoly may negatively affect innovation and the economy, conflicting with the goals of the Patent Act.³⁹ In addition, the Sherman Act makes it a misdemeanor to monopolize any part of trade or commerce in the United States.⁴⁰ The USPTO aims to encourage invention by rewarding inventors with granted patents and excluding certain ideas from patent protection to promote competition.⁴¹ Unfortunately,

allowed); *see also* *Alice*, 573 U.S. at 221 (explaining giving patents for abstract ideas could grant monopoly and impede progress of art and science); *Island Intell. Prop., LLC v. Stonecastle Asset Mgmt. LLC*, 463 F. Supp. 3d 490, 490 (S.D.N.Y. 2020) (stating for patent eligibility purposes, the “inventive concept must offer ‘significantly more than the abstract idea itself, and cannot simply be an instruction to implement or apply the abstract idea on a computer.’”).

36. *See* MPEP § 2106 (9th ed. Rev. 10, June 2020) (explaining complete examination should be made for every claim to determine patentability requirements). Subject matter, enablement, written description, definiteness, novelty, utility, and obviousness must be considered together to determine patentability. *See id.* (providing requirements for patentability).

37. *See Patent Basics Patents: Property or Monopoly?*, PATENT PROGRESS, <https://www.patentprogress.org/basics/patents-property-or-monopoly/> [<https://perma.cc/RM3L-8F6B>] (last visited Jan. 2, 2023) (explaining patent boundaries “can be very difficult and costly to determine” and that “a patent on an abstract idea . . . is effectively a monopoly over a basic aspect of technology”).

38. *See* Monopoly, DICTIONARY.COM, <https://www.dictionary.com/browse/monopoly> [<https://perma.cc/Y4B3-E8BB>] (last visited Mar. 11, 2023) (defining monopoly).

39. *See* Mark Thoma, *What’s so Bad About Monopoly Power*, CBS NEWS (Sept. 18, 2014, 5:30 AM), <https://www.cbsnews.com/news/whats-so-bad-about-monopoly-power/> [<https://perma.cc/FU3K-R2QD>] (explaining that monopolies can give companies or individual owners too much power leading to “inefficient allocation of resources” and prices that are “too high” and production that is “too low”).

40. *See* Sherman Antitrust Act, 15 U.S.C. §§ 1–38 (2022) (explaining laws against monopolies in US); *see also* *Crocs, Inc. v. Effervescent, Inc.*, 248 F. Supp. 3d 1040, 1047–49 (D. Colo. 2017) (noting Crocs is leading manufacturer of clog-type footwear products and Dawgs is competitor who sells various footwear, including molded clogs). Dawgs argued that each feature in the Crocs’ patent already existed in the prior art. *See id.* (explaining Dawgs also alleged claims related to anti-competitive conduct for monopolization violated Sherman Act and attempted to monopolize).

41. *See* *Timely Prods. v. Costanzo*, 465 F. Supp. 91, 94–95 (D. Conn. 1979) (explaining investor and inventor entered written license agreement to manufacture and sell electrically heated socks in patent). Federal patent law aims to sustain a balance between two socially desirable objectives. *See id.* (concluding “[while] the grant of a statutory monopoly encourages invention by rewarding the patentee with the sole right for a limited time to make, use and sell the patented product. On the other hand, all ideas in general circulation that are not protected by a valid patent must be dedicated to the common good in order to promote competi-

patent rights give a patent holder a “limited monopoly” or the power to exclude others from “manufacturing, using, or selling his invention.”⁴² As a result, the USPTO must carefully avoid granting patents for broad and abstract ideas that could result in monopolization.⁴³

2. *Utility*

In addition to the appropriate subject matter, a patent must also be useful.⁴⁴ The USPTO will only grant a patent for inventions with a specific and substantial benefit to society that a person having ordinary skill in the art (“PHOSITA”) can identify.⁴⁵ Specific utility means the use cannot be vague and meaningless.⁴⁶ Substantial utility means there is a significant and presently available benefit to the public.⁴⁷

tion”). *See also General Information Concerning Patents, supra* note 17 (explaining USPTO “seeks to preserve the United States’ technological edge”).

42. *See Ethyl Gasoline Corp. v. United States*, 309 U.S. 436, 448 (1940) (holding “patent law confers on the patentee a limited monopoly, the right or power to exclude all others from manufacturing, using, or selling his invention” and limits of right are defined by claims of patent); *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 731 (2002) (explaining even though patent act grants temporary monopoly on inventions, invention must be clearly described in “full, clear, concise, and exact terms” to maintain balance between rewarding innovation and promoting progress).

43. *See Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 71 (2012) (holding laws of nature, natural phenomena, and abstract ideas are not patentable, and these exceptions exist because monopolizing basic tools of scientific work “might tend to impede innovation more than it would tend to promote it”); *see also* Stein IP LLC, *The Patent Wars*, LEXOLOGY (July 24, 2014), <https://www.lexology.com/library/detail.aspx?g=40a9e6a0-9175-4aa1-9ab4-33557f99bf4b> [<https://perma.cc/5XCT-7KKC>] (explaining patent wars occur when patent owners in competitive fields bring lawsuits repeatedly against competitors and “[a] successful patent lawsuit could give the winner market dominance”).

44. *See* 35 U.S.C. § 101 (2022) (“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 therefor, subject to the conditions and requirements of this title.”); *see also* MPEP § 2107 (explaining examining guidelines prove that utility must be “specific, substantial and credible”).

45. *See Brenner v. Manson*, 383 U.S. 519, 534–35 (1966) (providing patent rights can create monopoly of knowledge, and patents should only be granted if there is benefit to public through substantial and specific utility that can serve as justification to allow restrictions).

46. *See In re Fisher*, 421 F.3d 1365, 1371 (Fed. Cir. 2005) (explaining applications must have use “which is not so vague as to be meaningless”).

47. *See Brenner*, 383 U.S. at 534–35 (holding that specific benefit must be currently available).

3. *Enablement, Written Description, and Definiteness*

Next, a patent must properly enable, describe, and define the invention.⁴⁸ First, a properly enabled invention allows a PHOSITA to replicate the invention without undue independent experimentation.⁴⁹ Undue experimentation occurs when a PHOSITA cannot recreate the patent without numerous independent experiments because the patent is vague.⁵⁰ Second, the patent description must fully support and define the patent's claims to prove that the inventor possessed the invention when filing the patent.⁵¹ Third, a definite patent claim must inform a PHOSITA with reasonable certainty of the scope of the invention.⁵²

48. See 35 U.S.C. § 112(a) (2022) (“The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor or joint inventor of carrying out the invention.”).

49. See *Incandescent Lamp Patent*, 159 U.S. 465, 472 (1895) (holding claim for incandescent conductors for electric lamps is too broad and is attempt to monopolize all fibrous and textile materials for electric lamp conductors); see also *In re Wands*, 858 F.2d 731, 737 (Fed. Cir. 1988) (explaining factors to consider if PHOSITA would be required to engage in undue experimentation to make and use invention are quantity of experimentation, amount of guidance given, presence of working examples, nature of invention, prior art at time of filing, relative of skill of those in art, and predictability of art and breadth of claim).

50. For further discussion of undue experimentation, see *supra* note 49 and accompanying text.

51. See *Gentry Gallery, Inc. v. Berkline Corp.*, 134 F.3d 1473, 1479 (Fed. Cir. 1998) (illustrating adequate written description needs more than mere statement that it is part of invention and you must allow PHOSITA to recognize what is being claimed); *Regents of Univ. of Cal. v. Eli Lilly & Co.*, 119 F.3d 1559, 1566 (Fed. Cir. 1997) (holding written description must allow PHOSITA to recognize that inventor invented what is claimed and inventor had possession of claimed subject matter at time of filing date); *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (explaining “level of detail required to satisfy the written description requirement varies depending on the nature and scope of the claims”).

52. See *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 899 (2014) (concluding absolute precision is not necessary, and definiteness must be evaluated from perspective of PHOSITA); see also *Sung*, *supra* note 17 (“Whether a claim is invalid as indefinite depends upon whether those skilled in the art would understand what is claimed when the patent claim is read in light of the remainder of the patent application.”). See generally *Gentry*, 134 F.3d at 1476 (“The proper construction of claims is based upon the claim language, the written description portion of the specification, the prosecution history, and if necessary to aid the court’s understanding of the patent, extrinsic evidence.”).

4. *Novelty*

In addition, the USPTO will not grant a patent unless the invention is novel.⁵³ The inventor or a third party cannot have priorly patented, described in a publication, publicly used, or sold the invention before the filing date of the claimed invention.⁵⁴ The USPTO looks at prior art to determine whether the invention is novel.⁵⁵ Prior art includes any references in public knowledge or publicly available that disclose information relevant to the invention.⁵⁶

5. *Non-Obvious*

Lastly, a PHOSITA must find the patentable invention non-obvious before the filing date.⁵⁷ The USPTO determines obviousness by looking at the scope and content of the prior art, differences between the prior art and the claims at issue, and the level of ordinary skill in the pertinent art.⁵⁸ The USPTO only looks at analogous prior art from the same field as the invention or prior art relevant to the particular problem.⁵⁹ The USPTO determines the

53. See 35 U.S.C. § 102 (2022) (stating novelty is requirement for patent protection).

54. See 35 U.S.C. § 102(a)(1) (2022) (“[P]erson shall be entitled to a patent unless — (1) the claimed invention was patented, described in a printed publication, or in public use, on sale, or otherwise available to the public before the effective filing date of the claimed invention”); 35 U.S.C. § 102(b)(1) (showing exceptions to prior art such as disclosures made one year or less before effective filing date by inventor or another who obtained information directly from inventor); see also *In re Klopfenstein*, 380 F.3d 1345, 1348–49 (Fed. Cir. 2004) (holding printed publication means reference was sufficiently accessible to interested public); see also *Egbert v. Lippmann*, 104 U.S. 333, 339 (1881) (explaining use by friend of family can count as public use when you give up control of something); see also *In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999) (noting anticipation occurs if every claim element in patent is described in single prior art).

55. See MPEP § 901 (listing types of different references that can be considered prior art).

56. See *id.* (defining prior art).

57. See 35 U.S.C. § 103 (2022) (stating patent may not be obtained if “the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains”).

58. See *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966) (explaining courts can use secondary considerations such as commercial success, long-felt unsolved issues, unexpected advantages, simultaneous inventions, failure of others, and disbelief of experts to determine obviousness).

59. See *In re Clay*, 966 F.2d 656, 658–59 (Fed. Cir. 1992) (concluding relevant prior art is determined by looking at field and particular problem being addressed); see also MPEP § 2141.03 (providing types of obviousness include combining prior art elements according to known methods to yield predictable results, simple substitution for obtaining predictable results, use of known techniques to

level of ordinary skill in the art by examining each of the following: (1) types of problems in the art, (2) prior solutions to those problems, (3) the speed of innovation, (4) the sophistication of the technology, and (5) the education level of active workers in the field.⁶⁰ Inventions with unexpected results are also considered non-obvious.⁶¹

C. Running into Requirements for a Design Patent

Design patents are given for “any new, original and ornamental design for an article of manufacture.”⁶² While both a design and utility patent can be granted for the same invention, design patents only protect how the invention looks.⁶³ The design must be definite, preconceived, capable of reproduction, and cannot exist alone, separate from the article of manufacture.⁶⁴ The term for a design patent is a fixed term of fifteen years compared to the twenty-year term for a utility patent.⁶⁵ Moreover, design patents

improve similar devices in the same way, obvious to try, and some teaching that would have led PHOSITA to combine prior art references).

60. *See In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (explaining courts will consider various factors to determine skill level of PHOSITA); *see also* MPEP § 2141.03 (listing various factors required).

61. *See United States v. Adams*, 383 U.S. 39, 50–52 (1966) (explaining electric battery using water was non-obvious). An invention that is obvious to try can be non-obvious when the prior art gives no indication of which parameters to use and if there are many choices or when it is obvious to try and explore new technology in a promising field, but the prior art only gave general guidance. *See In re Kubin*, 561 F.3d 1351, 1361 (Fed. Cir. 2009) (holding patents are non-obvious if they succeed where no one else has and there is no reasonable expectation of success).

62. *See* 35 U.S.C. § 171 (2022) (stating “whoever invents any new, original and ornamental design for an article of manufacture may obtain a patent”); *see also* MPEP § 1502 (explaining design patent applications claim only designs in or applied to article of manufactures, not actual articles). Ornamental designs include all surface ornamentation and the configuration of goods, visual characteristics, or the combination of configuration and surface ornamentation. *See* MPEP § 1502 (explaining “design is inseparable from the article to which it is applied” and must be reproducible).

63. *See* MPEP § 1502.01 (“Both design and utility patents may be obtained on an article if invention resides both in its utility and ornamental appearance.”); *see also* Menell et al., *supra* note 21, at 459 (“A design may consist of surface ornamentation, configuration, or a combination of both.”).

64. For further discussion of patentable designs, *see supra* notes 61–62 and accompanying text.

65. *See* MPEP § 1502.01 (explaining term of United States design patent lasts fifteen years and is measured from date of granting design patent, while utility patents last twenty years from earliest filing date in US). Design patents have a fixed fifteen-year term, and no maintenance fees are required throughout the term to keep the patent alive, unlike utility patents, which require multiple maintenance fees. *See* 35 U.S.C. § 173 (2022) (explaining patents filed on or after May 13, 2015, have fifteen-year grants while applications before May 13, 2015, only have fourteen-year term for design patent term).

only have one claim.⁶⁶ Design patents require ornamentality, novelty, and non-obviousness to qualify.⁶⁷ While the USPTO grants design patents for functional articles, the ornamental design must be utilized mainly for aesthetic pleasure.⁶⁸ The design of an article of manufacture is considered functional if the design is “dictated by the use or purpose of the article” and no other design can achieve the same function.⁶⁹ Similar to utility patents, design patents must also be novel and non-obvious.⁷⁰ Novelty in a design patent is determined by comparing prior art and whether an ordinary observer would consider the design novel from the existing prior art.⁷¹ Non-obviousness is evaluated by looking at references that are similar in appearance or would suggest the application of certain features in a similar product.⁷²

66. See MPEP § 1502.01 (explaining design patents, unlike utility patents, only have one claim); MPEP § 1503.01 (stating “the claim shall be in formal terms to the ornamental design for the article” and more than one claim is not permitted); see also U.S. Patent No. US D848,136 S (issued May 14, 2019) (claiming “the ornamental design for a shoe, as shown and described” for design patent for Nike shoe).

67. See Menell et al., *supra* note 21, at 460 (illustrating design patent requires novelty, originality, and non-obviousness, and design must be ornamental and not reliant on functional considerations).

68. See MPEP § 1504.01 (mentioning ornamental feature or design in patent must be more than simply result of functional considerations); see also *Blisscraft of Hollywood v. United Plastics Co.*, 294 F.2d 694, 696 (2d Cir. 1961) (explaining ornamental means “product of aesthetic skill and artistic conception” and holding that pitcher with no aesthetic appeal or motif in its design, line, form, or color was not ornamental).

69. See Menell et al., *supra* note 21, at 463 (explaining even if there is artistically pleasing appearance, it cannot be given design patent protection if dictated by function of article); see also *L.A. Gear, Inc. v. Thom McAn Shoe Co.*, 988 F.2d 1117, 1121–24 (Fed. Cir. 1993) (explaining plaintiff designed women’s athletic shoes, obtained design patent on shoes, and argued defendant had infringed their patents). The defendant argued that the design patent was invalid because it was functional, reasoning that if a design is essential to the use of an article, it is functional and cannot be granted a design patent. See *L.A. Gear*, 988 F.2d at 1121–24 (holding to determine if design is functional or ornamental design must be viewed as whole). If there are multiple ways to achieve the same function of the article of manufacture, the design is more likely to be ornamental. See *id.* (holding patent was not invalid and was primarily ornamental).

70. See MPEP § 1504 (noting design patent requirements); see also Menell et al., *supra* note 21, at 460 (explaining that design patents must meet novelty, originality, and non-obviousness).

71. See MPEP § 1504.02 (explaining conditions for patentability for novelty from 35 U.S.C. § 102 apply to design patents); MPEP § 1504.03 (explaining *Graham* test applies to evaluating obviousness of design patents).

72. See *Blisscraft of Hollywood*, 294 F.2d at 696 (concluding pitcher design with combination of well-known elements was unoriginal combination and pitcher was not original in comparison to existing prior art in field of pitchers); see also MPEP § 1504.03 (explaining design must be obvious to designer with ordinary skill in art for type of article it is applied to considering prior art).

D. All Tied Up: Patent Infringement

1. *Literal Infringement*

Anyone who makes, uses, offers, or sells any patented invention without authority infringes a patent.⁷³ An infringer can infringe on a utility patent through literal or indirect infringement.⁷⁴ For literal infringement, the infringing product must have every element of the patented claims or must fall within the doctrine of equivalents.⁷⁵ The doctrine of equivalents provides that if there is substantially the same function in substantially the same way that will achieve substantially the same result, there is infringement even if every element is not disclosed.⁷⁶ Prosecution history estoppel prevents a patent owner from claiming the doctrine of equivalents for any subject matter lost when narrowing a claim during patent prosecution.⁷⁷ However, any cosmetic amendments and changes to a claim that are unrelated to the patentability of a claim are not barred.⁷⁸

2. *Indirect Infringement*

Indirect infringement of a utility patent can occur through either active inducement or contributory infringement.⁷⁹ Active in-

73. See 35 U.S.C. § 271(a) (2022) (“Except as otherwise provided in this title, whoever 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 therefor, infringes the patent.”).

74. See *General Information Concerning Patents*, *supra* note 17 (explaining literal infringement is determined by language of claims); see also Menell et al., *supra* note 21, at 369 (explaining literal infringement occurs when person infringes on all of elements of claimed invention). See generally Menell et al., *supra* note 21, at 386 (concluding people can infringe patents through indirect infringement by “aid, abet, contribute, and induce violations of property and personal interest”).

75. See MPEP § 2186 (explaining even if products do not literally infringe patented inventions, they can still infringe under doctrine of equivalents if they contain elements identical to each claimed element).

76. See *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 733 (2002) (explaining doctrine of equivalents allows patentee to claim alternatives to patent that were not explicitly stated in claims); *Sanitary Refrigerator Co. v. Winters*, 280 U.S. 30, 42 (1929) (quoting *Mach. Co. v. Murphy*, 97 U.S. 120, 125 (1877) (stating “if it performs substantially the same function in substantially the same way to obtain the same result” doctrine of equivalents applies)).

77. See *Festo*, 535 U.S. at 723 (demonstrating prosecution history estoppel applies to amendments intended to narrow patented invention’s subject matter and bars inventor from claiming infringement using broader claims).

78. See *id.* at 736–37 (explaining cosmetic amendments do not narrow patent scope and thus do not cause estoppel).

79. See 35 U.S.C. § 271(b) (2022) (“Whoever actively induces infringement of a patent shall be liable as an infringer.”); see also 35 U.S.C. §271(c) (2022) (“Whoever offers to sell or sells within the United States or imports into the United States a component of a patented machine, manufacture, combination or composition,

ducement of patent infringement requires knowledge of the patent and the direct acts that are infringing the patent.⁸⁰ Direct acts of infringement include making, selling, offering to sell, or using a patented invention without permission.⁸¹ However, willful blindness satisfies the knowledge required when evaluating infringement claims.⁸² Contributory infringement, or selling or offering to sell patented material, also requires knowledge of the patent and that the contributing activity is infringement.⁸³ In addition, the infringing product cannot have a substantial non-infringing use for contributory infringement.⁸⁴ Patent infringement in a design patent occurs when the patented design is manufactured or sold without the patent holder's permission.⁸⁵ USPTO examiners must evaluate design patent infringement from the view of an ordinary observer to determine if the design viewed in its entirety is so similar that it is considered infringing.⁸⁶

3. *Defenses and Damages*

Patent infringement defenses include an argument that the patent is invalid, inequitable conduct made the patent unenforce-

or a material or apparatus for use in practicing a patented process, constituting a material part of the invention, knowing the same to be especially made or especially adapted for use in an infringement of such patent, and not a staple article or commodity of commerce suitable for substantial noninfringing use, shall be liable as a contributory infringer.”).

80. See *Glob.-Tech Appliances, Inc. v. SEB S.A.*, 563 U.S. 754, 765–66 (2011) (holding 35 U.S.C. § 271(b) and (c) both require knowledge of existence of patent even though it is not explicitly stated in statute).

81. See 35 U.S.C. § 271(a) (2022) (“Whoever 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 therefor, infringes the patent.”).

82. See *Glob.-Tech Appliances, Inc.*, 563 U.S. at 768 (holding willful blindness is widely accepted, used in many criminal statutes, and applies in civil lawsuits under 35 U.S.C. § 271(b) for patent infringement under inducement).

83. For further discussion of contributory infringement, see *supra* notes 77–79 and accompanying text.

84. See *Aro Mfg. Co. v. Convertible Top Replacement Co.*, 377 U.S. 476, 486 (1964) (finding replacement parts specifically made and designed to repair convertible tops had no other use other than to repair specific convertible tops).

85. See 35 U.S.C. § 289 (2022) (“Whoever during the term of a patent for a design, without license of the owner, (1) applies the patented design, or any colorable imitation thereof, to any article of manufacture for the purpose of sale, or (2) sells or exposes for sale any article of manufacture to which such design or colorable imitation has been applied . . .”).

86. See *L.A. Gear, Inc. v. Thom McAn Shoe Co.*, 988 F.2d 1117, 1125–26 (Fed. Cir. 1993) (concluding design patent infringement only relies on patented designs and any confusing similarity found by ordinary observer and “requires a showing that the accused design is substantially the same as the claimed design”).

able, or there was no infringement in the first place.⁸⁷ The remedies for patent infringement suits include damages and injunctions.⁸⁸ Damages consist of both reasonable royalties and lost profits.⁸⁹ The court awards lost profits for a foreseeable result of damages from actual infringement, using the “but for” test to determine if “but for” the infringement, the patent owner would not have lost the competition.⁹⁰ The court calculates reasonable royalties using the price that the patent owner could have negotiated in an agreement for the invention at the time of infringement.⁹¹ In addition, the patent owner can use permanent injunctions to stop the infringer from continuing use of the infringing product.⁹²

87. See 35 U.S.C. § 282(b) (2022) (stating defenses to patent infringement include no infringement or invalidity of patent or any claim in suit); see also *Therasense, Inc. v. Becton, Dickinson & Co.*, 649 F.3d 1276, 1285 (Fed. Cir. 2011) (explaining inequitable conduct or doctrine of unclean hands is defense to patent infringement). See generally *Purdue Pharma L.P. v. Endo Pharms., Inc.*, 410 F.3d 690, 695 (Fed. Cir. 2005) (“Inequitable conduct, which can arise from an affirmative misrepresentation of a material fact, failure to disclose material information, or submission of false material information, coupled with an intent to deceive or mislead the PTO.”).

88. See Menell et al., *supra* note 21, at 434–50 (outlining different remedies available for patent infringement); see also John D. Luken & Lauren Ingebritson, *Remedies in Intellectual Property Cases: Recent Trends in Reasonable Royalty Damages in Patent Cases*, DINSMORE, https://www.dinsmore.com/content/uploads/2018/11/2018_02_Remedies_01_Patents_A_Royalty_Damages.pdf [<https://perma.cc/WY9S-QXPR>] (last visited Mar. 9, 2023) (explaining that while injunctions, lost profits, and reasonable royalty damages are all available as remedies, reasonable royalty damages are most common).

89. See Menell et al., *supra* note 21, at 434–50 (explaining multiple types of damages can be granted from patent infringement suits); see also Brian Farkas, *What Types of Damages Will Court Award for Patent Infringement?*, Nolo, <https://www.nolo.com/legal-encyclopedia/what-types-of-damages-or-compensation-will-court-award-for-patent-infringement.html> [<https://perma.cc/NHV5-VUY3>] (last visited Mar. 9, 2023) (defining reasonable royalties as “fair market value of a license” that patent owner could have earned on their patent and defining lost profits as “the monies that you or your company could have made but for the defendant’s wrongful infringement of your patent.”).

90. See *Panduit Corp. v. Stahl Bros. Fibre Works*, 575 F.2d 1152, 1158 (6th Cir. 1978) (determining there is four-factor test to prove lost profits on sales (1) you must prove demand for patented product, (2) absence of acceptable non-infringing substitutes, (3) manufacturing and marketing capability to meet demand, and (4) amount of profit that would have been made).

91. See *Georgia-Pac. Corp. v. U.S. Plywood Corp.*, 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970) (finding factors used to determine reasonable royalties include rates paid by licensee in comparable patent, nature and scope of license, licensors tendency to license out patent, duration of patent, established profitability of product, and commercial success of product).

92. See *eBay Inc. v. MercExchange, L.L.C.*, 547 U.S. 388, 391 (2006) (providing permanent injunctions for patents are granted after four factor analysis including (1) plaintiff must show irreparable injury, (2) remedies available at law are inadequate to compensate for injury, (3) remedy is warranted after considering

E. The “Sole” of Athletic Footwear

Specialized footwear that enhances body function during exercise and athletic events is a competitive market for research and development.⁹³ Older utility patents for athletic footwear include advancements such as segmented soles, cleated footwear, shock-absorbing devices, and advanced cushioning systems.⁹⁴ Additional athletic footwear inventions patented by athletic brands include collapsible shoes stored in vending machines, breathable knitted sneakers, and individual toe slot footwear.⁹⁵ Patent infringement cases in athletic footwear mainly include claim construction suits where the parties dispute the meaning of certain claim terms to determine infringement and the validity of patents.⁹⁶ Infringement lawsuits occurred because many athletic footwear patents utilize similar concepts, such as advanced cushioning systems, inflated

the balance in hardships between plaintiff and defendant, and (4) public interest would not be harmed by granting permanent injunction); *see also* Doris Johnson Hines & J. Preston Long, *The Continuing (R)evolution of Injunctive Relief in the District Courts and the International Trade Commission*, FINNEGAN, <https://www.finnegan.com/en/insights/articles/the-continuing-r-evolution-of-injunctive-relief-in-the-district.html> [<https://perma.cc/WZ92-H88N>] (last visited Mar. 9, 2023) (noting four factor analysis makes it very difficult to obtain injunctions for patent infringement).

93. For further discussion of specialized footwear, *see infra* notes 94–95 and accompanying text.

94. *See* PCT Patent Application No. CA2020/051183 (filing date Aug. 30, 2019) (claiming “segmented sole for” Lululemon footwear); *see also* U.S. Patent No. US 10,786,038 B2 (issued Sept. 29, 2020) (claiming cleated footwear for Nike); *see also* U.S. Patent No. US 8,544,190 B2 (issued Oct. 1, 2013) (“shock absorbing device for shoe sole in a rear foot part” for Asics); *see also* U.S. Patent No. US 2020/0077741 A1 (issued Mar. 12, 2020) (claiming “cushioning member for article of footwear” for Nike).

95. *See* U.S. Patent No. US 7,805,860 B2 (issued Oct. 5, 2010) (claiming footwear having independently articulable toe portions for Vibram); *see also* U.S. Patent No. US 8,020,320 B2 (issued Sept. 20, 2011) (claiming “collapsible shoe” for Reebok); *see also* U.S. Patent No. US 10,306,946 B2 (issued June 4, 2019) (claiming “article of footwear having heel portion with knitted component” for Nike).

96. *See* Cushion Techs., LLC v. Adidas Salomon N. Am., Inc., 537 F. Supp. 2d 839, 842 (E.D. Tex. 2008) (illustrating plaintiff argued defendant infringed various claims of their patents because inventions shared common subject matter related to methods and articles for cushioning footwear). The invention is for footwear designed to absorb forces caused by the wearer during sporting activities. *See id.* (explaining court constructed various parts of claims to determine if there was patent infringement regarding cushioning footwear designed to absorb forces); *see also* Akeva L.L.C. v. Adidas-Salomon AG, 208 F. App’x 861, 862–66 (Fed. Cir. 2006) (explaining plaintiff is company with multiple footwear patents suing Adidas for infringement of two claims describing improvements to athletic shoe heels). The specification described a “flexible member” improvement that can be incorporated in rear soles that are detachable, or rotatable, or permanently secured.” *See id.* (explaining Adidas shoes only have permanently fixed rear soles that do not rotate, and parties were arguing meaning of the term “secured” in claim language).

bladders, and specialized shoe heels.⁹⁷ Athletic footwear companies focus their research and development on enhancing their athletic footwear performance and being competitive in the market.⁹⁸

F. Sprinting in Smart Shoes

Intelligent footwear is the newest technological advancement in athletic footwear.⁹⁹ Individuals can wear intelligent sneakers for gait analysis, improved comfort, support, distance tracking, weight distribution analysis, and data collection regarding the surrounding environment.¹⁰⁰ In addition, the shoes can track activity levels to measure daily fitness and calorie deficit.¹⁰¹ Pressure sensors in in-

97. For further discussion of patent infringement cases, see *supra* note 95 and accompanying text.

98. See Q.ai, *Nike is Suing Lululemon Over Patent Infringement, Again: Here's What Investors Need to Know About The War Between These Athletic Apparel Giants*, FORBES (Feb. 6, 2023), <https://www.forbes.com/sites/qai/2023/02/06/nike-is-suing-lululemon-over-patent-infringement-again-heres-what-investors-need-to-know-about-the-war-between-these-athletic-apparel-giants/?sh=4ee745515510> [<https://perma.cc/CMX4-NWP9>] (noting “Nike sued Lululemon on January 30, 2023” for Lululemon’s new sneaker line over patent infringement of Nike Flyknit sneaker); see also *Nike FlyKnit*, NIKE, <https://www.nike.com/flyknit> [<https://perma.cc/TUT5-F4VR>] (last visited Feb. 24, 2023) (describing Nike Flyknit as new shoe technology developed by Nike that uses “high-strength fibers” to create “lightweight uppers with targeted areas of support, stretch and breathability”).

99. See *Smart Shoe Market Demand, Share, Key Players, Size, Growth Analysis, and Forecast 2028*, MARKETWATCH (Feb. 8, 2023, 12:48 AM), <https://www.marketwatch.com/press-release/smart-shoe-market-demand-share-key-players-size-growth-analysis-and-forecast-2028-2023-02-08> [<https://perma.cc/GS5N-B3CG>] (noting “smart shoe market size is projected to reach multimillion USD by 2028” and market is growing); see also *Global Smart Shoes Market (2022 to 2027) - Industry Trends, Share, Size, Growth, Opportunity and Forecasts*, GLOBENEWSWIRE (April 1, 2022, 6:58 AM), <https://www.globenewswire.com/en/news-release/2022/04/01/2414681/28124/en/Global-Smart-Shoes-Market-2022-to-2027-Industry-Trends-Share-Size-Growth-Opportunity-and-Forecasts.html> [<https://perma.cc/LL3D-EEFT>] (“Smart shoes are widely utilized to improve performance, provide cushioning to the foot, and enhance comfort. In line with this, the increasing participation in sports-related and fitness activities is favoring the market growth. With the rising health consciousness, consumers are widely adopting smart shoes for maintaining a daily record of the activities to track progress.”).

100. See *Global Smart Shoes Market (2022 to 2027) - Industry Trends, Share, Size, Growth, Opportunity and Forecasts*, *supra* note 99 (“Smart shoes are widely used to provide personalized feedback to analyze fatigue, health, steps, calories, posture, and create precise data. They are commonly available in a wide variety of colors, sizes, and designs that can also be personalized with illustrations. As compared to standard shoes, smart shoes consist of inertial-magnetic measurement units used for gait analysis and have pressure sensors used to provide information on the distribution of body weight and monitor performance.”).

101. See Katie Rees, *Smart Shoes: What Are They? Can You Buy Them?*, MUO (Aug. 31, 2021), <https://www.makeuseof.com/smart-shoes-what-are-they-can-you-buy-them/> [<https://perma.cc/JRD9-HBLK>] (explaining that smart shoes can be used to track activity levels by monitoring steps, pace of movement, and number of calories you burn).

telligent shoes can make self-tightening and self-lacing shoes.¹⁰² Moreover, smart shoes can connect to smartphones via Bluetooth to give users easy access to collected data.¹⁰³

Adidas, the first athletic brand to venture into intelligent footwear and data tracking, wields their patents against competitors.¹⁰⁴ Adidas has multiple patents describing intelligent systems for articles of footwear that can automatically adjust in response to measured performance characteristics.¹⁰⁵ Adidas led the race to market with intelligent footwear by introducing the first smart shoe on their website in 2004.¹⁰⁶ The Adidas shoe provides intelligent cushioning that automatically and continuously adjusts using sensors and a magnet inside the shoe.¹⁰⁷ The intelligent system allows the cushioning to adjust, providing the most support throughout a run or other activity.¹⁰⁸ Adidas advertises itself as a clear leader in the field of intelligent footwear.¹⁰⁹ More recently, Adidas announced a new intelligent shoe system that detects soccer-specific move-

102. *See id.* (demonstrating shoes with pressure sensors can detect feet and self-lace the shoe).

103. *See Global Smart Shoes Market (2022 to 2027) - Industry Trends, Share, Size, Growth, Opportunity and Forecasts, supra* note 99 (stating smart shoes are “digitally connected to smartphone applications and are embedded with monitoring navigation and positioning, electronic systems, microchips, pressure sensors, and a battery”).

104. *See* Isaiah Poritz, *Nike Run Club, Mobile Apps Infringe Adidas Patents, Suit Says*, BLOOMBERG LAW (June 13, 2022, 10:47 AM), <https://news.bloomberglaw.com/ip-law/nike-run-club-mobile-apps-infringe-adidas-patents-suit-says> [<https://perma.cc/Z8QD-MFKP>] (explaining Adidas has previously sued Under Armour and Asics and filed complaint against Nike’s Adapt app stating it unlawfully uses Adidas’s patent for intelligent footwear system); *see also* Karen Gullo, *Adidas Sues Under Armour Over Mobile Fitness Patents*, BLOOMBERG LAW (Feb. 4, 2014, 9:08 PM), <https://www.bloomberg.com/news/articles/2014-02-05/adidas-sues-under-armour-over-mobile-fitness-patents?leadSource=Uverify%20wall#xj4y7vzkg> [<https://perma.cc/CGV8-BEXL>] (highlighting Adidas’s prior suit against Under Armour for its exercise tracking and fitness products).

105. *See* U.S. Patent No. US 7,676,960 B2 (issued Mar. 16, 2010) (claiming “intelligent footwear system” for Adidas).

106. *See Adidas Introduces First Intelligent Shoe*, ADIDAS (May 10, 2004), <https://www.adidas-group.com/en/media/news-archive/press-releases/2004/adidas-introduces-first-intelligent-shoe/> [<http://web.archive.org/web/20220614080814/https://www.adidas-group.com/en/media/news-archive/press-releases/2004/adidas-introduces-first-intelligent-shoe/>] (illustrating press release for shoe).

107. *See id.* (explaining how Adidas shoes function).

108. *See id.* (explaining how cushioning in Adidas shoes adjust).

109. *See id.* (claiming “in the last four years, adidas has launched more product innovations than any other sports brand”); *see also* Poritz, *supra* note 104 (stating complaint filed by Adidas states Adidas was “first in the industry to comprehensively bring data analytics to athletes”).

ment.¹¹⁰ The shoe includes a small software tag with tiny sensors inserted inside the sole of the shoe.¹¹¹

Examples of other recent intelligent footwear patents include footwear with interchangeable sensors, dance shoes with sensors for training, and automatic adjusting or lacing shoes.¹¹² Some of the most well-known smart shoes in 2022 include Nike HyperAdapt 1.0 and Under Armour UA HOVR Sonic.¹¹³ Nike is catching up with Adidas with its own electronic lacing system able to adjust to the shape of the user's foot and connect to the Nike app on smartphones.¹¹⁴ The Nike app also provides the ability to personalize the color of lights on the shoes.¹¹⁵ Under Armour is also active in the intelligent footwear market with a smart sneaker that tracks and analyzes data from the user's run and provides feedback to the user on a smartphone app.¹¹⁶ The sneaker contains an embedded sensor that transfers running metrics to the online app.¹¹⁷

Lastly, Puma has joined the smart shoe race with a self-lacing training shoe for workouts and light running.¹¹⁸ The sneaker has a mechanical system to lace the shoes and can connect to a

110. See *Adidas GMR FAQ*, ADIDAS, https://www.adidas.com/us/gmr_faq [http://web.archive.org/web/20220802032124/https://www.adidas.com/us/gmr_faq] (last visited Feb. 11, 2023) (explaining software tag utilized contains gyroscope, accelerometer, and small processor that can measure number of kicks, shot speed, run speed, and total distance runs).

111. See *id.* (explaining mechanics behind software tag).

112. See U.S. Patent No. US 11,464,276 B2 (issued Oct. 11, 2022) (claiming "pointe shoes and other footwear for dance performance and dance training" for Emily J. Sackett); see also U.S. Patent No. US 2018/0084868 A1 (issued Mar. 29, 2018) (claiming "self-fitting, self-adjusting, automatically adjusting, and/or automatically fitting" footwear for Peter A. Feinstein); see also U.S. Patent No. US 9,968,159 B2 (issued May 15, 2018) (claiming "footwear with interchangeable sole structure elements" for Nike).

113. See *HyperAdapt 1.0 Step Into The Future*, NIKE, <https://www.nike.com/launch/t/hyperadapt-1-0> [<https://perma.cc/LD4R-SUBT>] (last visited Feb. 7, 2023) (illustrating new smart shoes available on market).

114. See *Nike Adapt*, APPLE, <https://apps.apple.com/us/app/nike-adapt/id1449855096> [<https://perma.cc/PYX2-HXUX>] (last visited Apr. 4, 2023) (illustrating Nike's advancements in smart shoes).

115. See *id.* (explaining other features of Nike's smart shoe).

116. See *UA HOVR SONIC 2_1*, UNDER ARMOUR (Nov. 6, 2018), <https://about.underarmour.com/news/2018/11/2019-ua-hovr-sonic-2> [<https://perma.cc/B5VC-5EL3>] (showcasing Under Armour's smart shoe in today's market).

117. See *id.* (providing shoe has embedded sensor in sole of shoe that connects via Bluetooth to smartphone app and "can track, analyze, and store detailed running metrics to inform ways to improve performance").

118. See *Computer Meets Foot Fit Intelligence*, PUMA, <https://about.puma.com/en/innovation/fit-intelligence> [<https://perma.cc/7L8T-5PZV>] (last visited Feb. 7, 2023) (introducing Puma's smart shoe technology that is smart and self-lacing).

smartphone app.¹¹⁹ Puma has also researched with the MIT Design Lab on bio-designed sneakers called “breathing shoes” that can adapt to a user’s heat patterns and open slits for ventilation.¹²⁰

III. DOES THE SHOE FIT? SHOULD INTELLIGENT FOOTWEAR BE PATENTABLE?

Athletic companies are scrambling to patent new intelligent footwear designs as technology advances.¹²¹ Unfortunately, utility patents for intelligent footwear may include abstract, overbroad, and obvious concepts that may threaten the monopolization of the intelligent footwear market.¹²² Fortunately, athletic companies have alternative means available for intellectual property protection.¹²³

A. Tripping Over Loose Laces: Patentability Issues with Intelligent Footwear

Purely abstract ideas cannot be patented without adding an inventive step to prevent patent monopolization, however, there is no categorical rule to determine abstraction.¹²⁴ In the intelligent footwear market, using sensors and other basic software to populate workout and training metrics may constitute an unpatentable abstract idea.¹²⁵ For example, the 960’ Adidas patent which describes a variety of well-known sensor technology, could be viewed as using

119. *See id.* (demonstrating mechanics of Puma’s intelligent footwear system which uses a micrometer and a cable system).

120. *See* Thomas Catenacci, *These New Shoes Designed by Puma and MIT Lab Can Tell How You’re Feeling*, CNBC (June 7, 2018, 6:45 AM), <https://www.cnbc.com/2018/06/05/puma-mit-shoes-can-breathe.html> [<https://perma.cc/S2R4-CVPA>] (writing about collaboration between PUMA and MIT to research living breathable shoes); *see also* Jennifer Chu, *Researchers Design Moisture-Responsive Workout Suit*, MIT NEWS OFFICE (May 19, 2017), <https://news.mit.edu/2017/moisture-responsive-workout-suit-0519> [<https://perma.cc/UX2Q-223C>] (explaining MIT developed moisture responsive workout suit with ventilating flaps that open and close in response to athlete’s sweat and MIT also used same fabric to create prototype of running shoe with similar flaps).

121. For further discussion of new intelligent footwear patents, *see supra* notes 99–120 and accompanying text.

122. For further discussion of patentability issues in intelligent footwear, *see infra* notes 124–155 and accompanying text.

123. For further discussion of alternative options of protection, *see infra* notes 171–193 and accompanying text.

124. *See* MPEP § 2106.04(a) (“[E]numerated groupings of abstract ideas are defined as: 1) Mathematical concepts . . . 2) Certain methods of organizing human activity . . . and 3) Mental processes . . .”).

125. For further discussion of abstract ideas, *see supra* note 124 and accompanying text.

an abstract idea or natural law.¹²⁶ In addition, other common aspects of intelligent footwear systems, such as standard app and monitoring software, may also act as an abstract idea.¹²⁷ Computer software and calculation methods have been borderline abstract ideas that courts have debated for many years.¹²⁸ Intelligent footwear can analyze athlete biometrics using existing sensors inside shoes to provide feedback and adapt the shoe to better work for the wearer.¹²⁹ This is an abstract idea of using data gathering.¹³⁰ Simply placing such software inside a shoe may not be enough of an inventive step.¹³¹ Even if embedding these sensors and software inside athletic footwear can be considered an inventive step, patents must still be analyzed in light of the remaining requirements for patentability.¹³²

A PHOSITA may find combining commonplace sensors and Bluetooth software inside a wearable shoe obvious.¹³³ Utilizing wearable footwear sensors to measure athletes' biometrics is commonplace when wearable sensors are well-established and used in many ways.¹³⁴ Programs to analyze the training metrics of athletics

126. See U.S. Patent No. US 7,676,960 B2 (issued Mar. 16, 2010) (claiming “intelligent footwear system” for Adidas with “pressure sensor, a force transducer, a hall effect sensor, a strain gauge, a piezoelectric element, a load cell, a proximity sensor, an optical sensor, an accelerometer, a hall element or sensor, a capacitance sensor, an inductance sensor, an ultrasonic transducer . . .”).

127. For further discussion of abstract software patents, see *supra* note 31 and accompanying text.

128. For further discussion of abstract ideas, see *supra* note 31 and accompanying text.

129. See Bjoern M. Eskofier, Sunghoon Ivan Lee, Manuela Baron, André Simon, Christine F. Martindale, Heiko Gaoer, & Jochen Klucken, *An Overview of Smart Shoes in the Internet of Health Things: Gait and Mobility Assessment in Health Promotion and Disease Monitoring*, 7 APPL. SCI. 986, 986 (Sept. 25, 2017), available at <https://www.mdpi.com/2076-3417/7/10/986> [<https://perma.cc/4K56-ML5K>] (illustrating uses of smart shoes for health in areas like diagnostic work-ups, therapy, and disease monitoring).

130. See *Icon Health & Fitness, Inc. v. Polar Electro Oy*, 243 F. Supp. 3d 1229, 1238–39 (D. Utah 2017) (holding feedback based on data gathered from subjects is abstract idea).

131. *But see* *Fitbit, Inc. v. AliphCom*, 233 F. Supp. 3d 799, 806 (N.D. Cal. 2017) (explaining wearable fitness tracking device that can connect to smartphone is not abstract but acknowledging that “not all claims relating to computer technologies are not abstract,” especially if focus is on “‘certain independently abstract ideas that use computers as tools’ instead of ‘an improvement in computers as tools’”).

132. See MPEP § 2106 (stating patents must be examined using all requirements).

133. See *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 419 (2007) (explaining patents combining previously known elements can be considered obvious).

134. See *Case: Patents/Obviousness (P.T.A.B.)*, BLOOMBERG LAW (June 2, 2022, 2:46 PM), <https://www.bloomberglaw.com/product/blaw/bloomberglawnews/bloomberg-law-news/XFGCCII4000000?bc=W1siU2VhcmNoICYgQnJvd3NlIi>

and their body movements for improvement have existed for a long time.¹³⁵ In addition, research and development for athletic footwear before intelligent footwear focused on improving shoes to be better suited for certain movements and body structures.¹³⁶ A PHOSITA would find a combination of sensors, software, and wearable items to be an obvious next step in advancing athletic footwear.¹³⁷

Moreover, even if intelligent footwear systems are non-obvious, the patented claims may be overbroad and lead to a patent monopoly.¹³⁸ For example, the Adidas 960' patent is very broad enabling Adidas to bring multiple infringement suits against competing athletic brands.¹³⁹ The Adidas 960' patent is a working example of an overbroad patent containing an abstract idea that could cause a limited monopoly in the smart footwear industry.¹⁴⁰ The 960' patent broadly claims a system for monitoring performance characteristics such as velocity, acceleration, jerk, distance, and stride of the

wiaHR0cHM6Ly93d3cuYmxbv21iZXJnbGF3LmNvbS9wcm9kdWN0L2JsYXcv2VhcmNoL3Jlc3VsdHMvNdc5NzdmZTA1Nzk3YmViOTAzZTk5M2FiMGZIMTdjZDkiXV0 [https://perma.cc/ET2N-WKCN] (“[T]wo-part data collection system, including a noninvasive sensor that communicates with a patient monitor, are unpatentable as obvious.”); *see also Case: Patents/Obviousness (P.T.A.B.)*, BLOOMBERG LAW (May 10, 2022, 6:02 PM), <https://www.bloomberglaw.com/product/blaw/bloomberglawnews/bloomberg-law-news/XD580BMK000000?bc=W1siU2VhcmNoICYgQnJvd3NlIiwiaHR0cHM6Ly93d3cuYmxbv21iZXJnbGF3LmNvbS9wcm9kdWN0L2JsYXcv2VhcmNoL3Jlc3VsdHMvNdc5NzdmZTA1Nzk3YmViOTAzZTk5M2FiMGZIMTdjZDkiXV0> [https://perma.cc/W6B7-ZPAF] (stating patent for noninvasive methods and devices for measuring blood substances was obvious).

135. *See* Eskofier et al., *supra* note 129 (explaining uses of smart shoes for health).

136. For further discussion of developments in athletic footwear, *see supra* notes 93–120 and accompanying text.

137. For further discussion of obvious patents, *see supra* notes 58–61 and accompanying text.

138. *See* Incandescent Lamp Patent, 159 U.S. 465, 472 (1895) (holding broad claim was attempting to monopolize all fibrous and textile materials for illumination); *O'Reilly v. Morse*, 56 U.S. 62, 129 (1853) (holding patent claim for all applications of electro-magnetism for printing signs, letters, and characters at distance as overbroad).

139. For further discussion of Adidas's infringement suits, *see infra* note 156 and accompanying text.

140. *See* 35 U.S.C. § 271(c) (2022) (“Whoever offers to sell or sells within the United States or imports into the United States a component of a patented machine, manufacture, combination or composition, or a material or apparatus for use in practicing a patented process, constituting a material part of the invention, knowing the same to be especially made or especially adapted for use in an infringement of such patent, and not a staple article or commodity of commerce suitable for substantial noninfringing use, shall be liable as a contributory infringer.”).

wearer and transmitting the signals.¹⁴¹ This claim can be viewed as extremely overbroad, creating a monopoly on any type of intelligent footwear that utilizes a sensor to analyze the wearer's body movement.¹⁴² Adidas is not alone in broadly patenting intelligent footwear systems; Nike's patent for its automatic lacing system may also allow Nike to bring unnecessary infringement suits against competitors.¹⁴³

A monopoly in athletic footwear may lead to a stalemate of innovation in an era where smart footwear is the next leading asset for athletes to analyze their fitness and development.¹⁴⁴ Biometrics are an important aspect of modern athletic training.¹⁴⁵ Athletes use biometrics in their training for various purposes in many sports.¹⁴⁶ For example, runners can map their gait, speed, impact of their feet, and environmental factors during their runs.¹⁴⁷ In addition, soccer players can gain valuable information regarding

141. See U.S. Patent No. US 7,676,960 B2 (issued Mar. 16, 2010) (claiming intelligent footwear system for Adidas that measures "the length of the stance phase to determine other performance characteristics of the shoe, for example velocity, acceleration, and jerk").

142. See *Morse*, 56 U.S. at 129 (finding claims are too broad if inventor does not confine to type of machinery and claim essence of invention).

143. See *Nike Adapt*, *supra* note 114 (explaining Nike Adapt App allows user to "tighten, loosen and fine-tune the fit of each shoe").

144. See Navneeta Kaul, *Smart Shoes: Innovations Revolutionizing the Future of Footwear*, PRESCOUTER (Oct. 2018), <https://www.prescouter.com/2018/10/smart-shoes-innovations-footwear/> [<https://perma.cc/MC9F-3W2J>] (hinting market for smart shoes will grow in coming years). People with monopolies in a product can produce inferior products or inflate prices because they know customers cannot find alternatives. See Dave Yost, *Competition Matters The Effects of Monopolies Are no Laughing Matter*, OHIO ATTORNEY GENERAL (Oct. 26, 2020), <https://www.ohioattorneygeneral.gov/Media/Newsletters/Competition-Matters/October-2020/The-Effects-of-Monopolies-are-No-Laughing-Matter> [<https://perma.cc/8RAG-M3D8>] (explaining monopolies give little room for innovation and improvement and make it difficult for new companies to enter market).

145. See Jeff Dengate, *Track Your Run with Smart Footwear*, RUNNER'S WORLD (Apr. 24, 2017), <https://www.runnersworld.com/gear/a20853776/track-your-run-with-smart-footwear/> [<https://perma.cc/E8JU-J2MF>] (referencing best new smart footwear technology for runners); see also Jason F. Arnold & Robert M. Sade, *Wearable Technologies in Collegiate Sports: The Ethics of Collecting Biometric Data from Student-Athletes*, 17 AM. J. BIOETH. 67, 67-70 (Jan. 2017), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5634810/> [<https://perma.cc/3NKW-Y8QT>] (explaining importance of biometrics to athletes, that many schools use biometrics in training student-athletes, and NCAA recently approved use of wearable technology in football).

146. See Arnold, *supra* note 145 (providing wearable devices have many applications and "the wearable technology industry is still in its infancy and future applications of these monitoring devices are broad").

147. See Eskofier et al., *supra* note 129 (demonstrating uses of smart shoes to measure effects on body during walking and running).

their kicks.¹⁴⁸ Athletes require competition in the marketplace to give themselves the opportunity to use the best technology available.¹⁴⁹ A monopoly in intelligent footwear systems would have detrimental effects on athletics.¹⁵⁰ Furthermore, as technology advances and smart footwear becomes the next big thing, brands will burden courts with many infringement suits regarding intelligent footwear systems.¹⁵¹

While the USPTO grants a limited monopoly by giving patent rights to incentivize innovation by rewarding inventors, the overall goal of the USPTO is to promote the progress of science.¹⁵² Patents for broad and abstract ideas may lead to an impasse in the development of large areas of technological advancement in the present day.¹⁵³ The USPTO acknowledges such hazards and has even set limitations on patent rights, such as prosecution estoppel and unpatentable subject matter, to prevent the excessive monopolization of broad ideas.¹⁵⁴ Granting broad utility patents for intelli-

148. See *Adidas GMR FAQ*, *supra* note 110 (explaining shoe is designed particularly for soccer players).

149. See *Timely Prods. v. Costanzo*, 465 F. Supp. 91, 94–95 (D. Conn. 1979) (“Federal patent law aims to sustain a balance between two socially desirable objectives. On the one hand, the grant of a statutory monopoly encourages invention by rewarding the patentee with the sole right for a limited time to make, use and sell the patented product. On the other hand, all ideas in general circulation that are not protected by a valid patent must be dedicated to the common good in order to promote competition.”).

150. For further discussion of the importance of wearable tracking devices for athletic training, see *supra* notes 145–147 and accompanying text.

151. See *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 732 (2002) (“If competitors cannot be certain about a patent’s extent, they may be deterred from engaging in legitimate manufactures outside its limits, or they may invest by mistake in competing products that the patent secures. In addition the uncertainty may lead to wasteful litigation between competitors, suits that a rule of literalism might avoid.”); see also James Bessen, *Patent Wars Abuse the System*, THE HILL (May 15, 2012, 7:41 PM), <https://thehill.com/blogs/congress-blog/technology/114440-patent-wars-abuse-the-system/> [<https://perma.cc/TXE2-W56W>] (explaining issues with patent infringement wars such as excessive legal fees for less powerful parties and crowding court dockets).

152. See *id.* at 730–31 (finding while monopolies are property rights granted by patents to reward innovation, it is important to make sure boundaries of patents are clear to promote progress and allow innovation); see also *General Information Concerning Patents*, *supra* note 17 (“Through the preservation, classification, and dissemination of patent information, the Office promotes the industrial and technological progress of the nation and strengthens the economy.”).

153. See *Festo*, 535 U.S. at 731 (quoting 35 U.S.C. § 112) (explaining patents must be described in “full, clear, concise, and exact terms” to allow balance between rewarding inventors and encouraging public to pursue innovations and creations beyond inventor’s exclusive rights).

154. See *Festo*, 535 U.S. at 731–32 (concluding because language in claims may not capture every element of invention with precision patents cannot be interpreted only in literal terms and all equivalents to claims must be embraced). How-

gent footwear systems violates the patent system even if patent protection incentivizes certain inventors to continue research and development.¹⁵⁵

B. Beyond the Shoe: It All Matters

Adidas also owns patents for mobile app software that can connect to wearable devices to track and display exercise statistics during workouts.¹⁵⁶ Adidas has repeatedly claimed that wearable workout trackers in correlation with their “supporting software” for the mobile apps are infringing their patents.¹⁵⁷ In addition to footwear, Adidas filed infringement suits against multiple types of software and wearables that track exercise and activity analytics.¹⁵⁸ The monopoly caused by patents for such broad ideas goes well beyond footwear and affects the entire industry of biometric analysis available to athletes.¹⁵⁹ The software apps Adidas claims to have power over are used in correlation with items such as smart clothing, watches, and bands, many of which are already mainstream today.¹⁶⁰

ever, since the doctrine of equivalents makes the scope of patents less certain, competitors could be deterred from engaging in manufacturing or competing with the products. *See id.* at 733–34 (explaining court has come to terms with these issues and held prosecution history estoppel as limitation to doctrine equivalents).

155. For further discussion of abstract ideas, see *supra* notes 124–155 and accompanying text.

156. *See* Gullo, *supra* note 104 (explaining Adidas sued Under Armour claiming its exercise tracking and fitness monitoring products infringed Adidas’s patents on mobile application technology that can track heart rate, calories burned, and other workout metrics); *see also* Poritz, *supra* note 104 (mentioning Adidas sued Nike claiming Nike Inc. mobile apps including Nike Run Club infringed Adidas’s patents for tracking systems, remote control athletic wear, and mobile fitness features).

157. *See* Gullo, *supra* note 104 (listing Under Armour’s infringing products such as “chest straps, watches and supporting software and mobile applications, and the mobile products marketed by the company’s MapMyFitness unit”).

158. For further discussion of infringement suits, see *supra* note 156 and accompanying text.

159. *See Fitbits of the Future: What’s Next For Biometric Data in Health?*, AETNA, <https://www.aetnainternational.com/en/about-us/explore/future-health/fitbit-biometric-tech-health-care.html> [<https://perma.cc/3P7A-5JE8>] (last visited Feb. 10, 2023) (finding “biometrics are now a key facet of everyday life”). Fitness trackers and wearable devices that can measure biometrics act as a motivation tool and reminder of a wearer’s health status. *See id.* (mentioning fitness trackers are for “anyone looking to monitor and improve their general health”).

160. *See* Alicia Phaneuf, *Latest Trends in Medical Monitoring Devices and Wearable Health Technology*, SPORTS BIOMETRIC CONFERENCE (Jan. 11, 2021), <https://sports-biometrics-conference.com/latest-trends-in-medical-monitoring-devices-and-wearable-health-technology/> [<https://perma.cc/7AP5-KPXF>] (mentioning there is a growing demand for wearable technology includes items like Fitbits, smartwatches, EKG monitors, blood pressure monitors, and biosensors); *see also* Gullo, *supra* note

C. Cutting to the Chase: Back to Patent Infringement

On the bright side, utility patents only last twenty years, and many Adidas patents have expiration dates within the next five years.¹⁶¹ However, if Adidas is allowed to keep creating new patents on broad subject matter similar to the intelligent footwear systems, their monopoly could last a lot longer than could ever be useful.¹⁶² If intelligent footwear and tracking devices become the new norm, Adidas's patent power will disturb competition in the market.¹⁶³ In addition to Adidas, other brands with broad patents can also chase after competitors, bringing cumbersome infringement suits.¹⁶⁴ As more athletic and fitness brands venture into the field of intelligent athletic footwear and other wearable devices, they will face the burden of working around the existing patents.¹⁶⁵ As noted earlier, patent infringement suits can result in either reasonable royalties or lost profits damages.¹⁶⁶ These damages can amount to large sums of money that create a deterrent for competing companies to steer clear of the intelligent footwear market.¹⁶⁷

104 (detailing that Under Armour has products such as chest straps and watches supporting mobile application software).

161. See 35 U.S.C. § 154(a)(2) (2022) (explaining patents have twenty-year term from date patent is filed).

162. For further discussion of market disruption, see *supra* notes 159–160 and accompanying text.

163. See *Fibbits of the Future: What's Next for Biometric Data in Health?*, *supra* note 159 (providing global wearable devices market is expected to nearly double by 2021, and emerging smart clothing is expected to increase).

164. See Christopher Yasiejko, *Garmin, Adidas Wearables Among Targets of New Patent Suits (1)*, BLOOMBERG LAW (Aug. 23, 2022, 10:34 AM), <https://news.bloomberglaw.com/ip-law/garmin-adidas-wearables-among-targets-of-new-patent-suits> [<https://perma.cc/LE2H-YA7M>] (finding brands used multiple wearable fitness device makers alleging infringement of expired patents that expired in December 2020 claiming infringement occurred during patent term); see also 35 U.S.C. § 286 (2022) (noting you cannot recover damages for infringement that happened more than six years before complaint for infringement is filed because there is a six-year time limitation).

165. For further discussion of market growth in intelligent footwear, see *supra* note 160 and accompanying text.

166. For further discussion of patent infringement and damages, see *supra* notes 73–92 and accompanying text.

167. See Muireann Bolger, *Intel Owes Record \$2.2bn Patent Damages Says Jury Verdict*, WORLD INTELLECTUAL PROPERTY REVIEW (Mar. 3, 2021), <https://www.worldipreview.com/news/intel-owes-record-2-2bn-patent-damages-says-jury-verdict%2021102> [<https://perma.cc/FR6J-3KHH>] (detailing jury awarded VLSI technology 1.5 billion in damages for patent infringement in infringement suit against Intel for patents regarding data processing system); see also Rory O'Neill, *Patent Lawsuits and Damages on the Rise in US*, WORLD INTELLECTUAL PROPERTY REVIEW (Mar. 15, 2021), <https://www.worldipreview.com/news/patent-lawsuits-and-damages-on-the-rise-in-us-21137> [<https://perma.cc/ND7X-JHNP>] (stating in times of

D. No Small “Feet”: Acquiring Other Avenues of Protection

Athletic companies still require intellectual property protection for their products.¹⁶⁸ Multiple alternative routes include design patents, trademark protection, and even NDAs.¹⁶⁹ While utility patents may not be the best choice, athletic companies still have options for protection.¹⁷⁰

1. *Design Patents*

As an alternative to utility patent protection, design patents may be the best avenue of patent protection for intelligent athletic footwear.¹⁷¹ Design patents would not cause a monopoly as items can be designed in many ways while still employing the same abstract idea.¹⁷² Athletic sports companies already have many design patents for their products.¹⁷³ The concept of intelligent athletic footwear is a broad idea that may not be suitable for a utility patent.¹⁷⁴ However, athletic brands put a lot of thought into their products’ design and aesthetic appeal.¹⁷⁵ Brands aim to have eye-

economic uncertainty companies look to file infringement suits to maximize their investments).

168. See *Why is IP Important?*, U.S CHAMBER OF COMMERCE, <https://www.theglobalipcenter.com/why-is-ip-important/> [https://perma.cc/D9CX-D77V] (last visited Mar. 3, 2023) (listing reasons why intellectual property protection is important for companies such as creating high-paying jobs and driving economic growth).

169. For further discussion of alternative options of protection, see *infra* notes 171–193 and accompanying text.

170. For further discussion of utility patents, see *infra* notes 27–61 and accompanying text.

171. For further discussion of design patents, see *supra* notes 62–72 and accompanying text.

172. See *Design Patent Application Guide*, USPTO (Sept. 19, 2022, 6:32 AM), <https://www.uspto.gov/patents/basics/types-patent-applications/design-patent-application-guide> [https://perma.cc/8T8S-FM9S] (noting design patents only cover appearance of articles of manufacture, not structural or utilitarian features).

173. See U.S. Patent No. D312,527 (issued Dec. 4, 1990) (Nike, applicant) (claiming “ornamental design for an athletic shoe upper” for Nike); see also U.S. Patent No. D690,093 (issued Sept. 24, 2013) (claiming “ornamental design for an athletic shoe” for Under Armour); see also U.S. Patent No. D677,454 (issued Mar. 12, 2013) (claiming “ornamental design for a shoe outsole” for Nike).

174. For further discussion of design patents, see *supra* notes 62–72 and accompanying text.

175. See *Nike Air Huarache SE*, NIKE, <https://www.nike.com/t/air-huarache-crater-prm-womens-shoes-GZpbBG/DQ0117-100> [https://perma.cc/2M3W-FQT6] (last visited Feb. 10, 2023) (advertising special ocean-inspired colors to provide 1990s aesthetic); see also Andy Polk, *Inside Adidas: How Shoes are Made*, FOOTWEAR DISTRIBUTORS & RETAILERS OF AMERICA (Feb. 15, 2023), <https://fdra.org/latest-news/inside-adidas-how-shoes-are-made> [https://perma.cc/7BSX-H4WM] (discussing Adidas shoe design and development process and “all of the intricacies that went into the creation of the shoe”).

catching and appealing designs that keep up with the latest fashion trends for their athletic footwear that remain separate from the functionality of the shoe.¹⁷⁶ As a result, athletic shoe brands can file design patents for their footwear lines.¹⁷⁷

Intelligent footwear may be commonplace in the future, but shoe designs will keep evolving and changing to suit the changing trends in fashion.¹⁷⁸ Design patents can effectively allow companies to keep their competitive edge in the marketplace without creating a monopoly on a single abstract idea.¹⁷⁹ Multiple companies can have intelligent footwear shoes but they can have varying designs.¹⁸⁰ Design patents are also useful when trademark and copyright protection cannot protect a highly functional item like a shoe.¹⁸¹ Design patents can protect “the visual characteristics” of a shoe, such as the shape or any surface decorations.¹⁸²

2. Trademarks

However, trademark protection is still available for footwear even though it may be harder to prove trademarkable footwear has no functionality.¹⁸³ Product features required for a good’s function

176. For further discussion of advertising, see *supra* note 175 and accompanying text.

177. For further discussion of design patents, see *supra* notes 62–72 and accompanying text.

178. For further discussion of market trends, see *supra* note 160 and accompanying text.

179. See Jonathan Hyman, Charlene Azema, & Loni Morrow, *If the IP Fits, Wear It: IP Protection for Footwear—A U.S. Perspective*, 108 TRADEMARK REP. 645, 703 (2018) (noting design patents only protect designs substantially similar to patented design not idea behind design); see also *Design Patent Application Guide*, USPTO (Sept. 19, 2022), <https://www.uspto.gov/patents/basics/types-patent-applications/design-patent-application-guide> [<https://perma.cc/6FX9-CA64>] (concluding patentable designs must be original and cannot be well-known or naturally occurring).

180. For further discussion of existing design patents, see *supra* note 173 and accompanying text.

181. See Hyman et al., *supra* note 179, at 702 (explaining design patents can protect shoe shapes without requiring secondary meaning or acquired distinctiveness). Design patents are beneficial because they can provide protection when copyright and trade dress protection is unavailable. See *id.* at 709 (discussing design patents for footwear).

182. See MPEP § 1502.01 (explaining design patents protect appearance of articles, including shape, configuration, and surface ornamentation applied to articles).

183. See *What Is a Trademark*, USPTO (Feb. 6, 2023, 12:40 PM), <https://www.uspto.gov/trademarks/basics/what-trademark> [<https://perma.cc/SXK9-3CXH>] (explaining trademarks can identify source of good or service, provide legal protection for brand, and guard against counterfeiting and fraud). A trademark can be any word, phrase, symbol, design, or combination of the above that identifies a good or service. See *id.* (defining trademarks); see also Lanham Act, 15

and use are not trademarkable.¹⁸⁴ Yet, trademark protection is possible if shoes have a distinct look, symbolism, or color.¹⁸⁵ The USPTO also grants trademark protection for product packaging and displays serving as source identifiers.¹⁸⁶ Moreover, the software apps used by athletic brands in collaboration with the intelligent footwear system all have distinct trademarkable layouts and images.¹⁸⁷ Trademark protection has the added benefit of lasting longer than patent protection.¹⁸⁸ Trademark protection would not result in a monopoly because a brand can design something in many ways, even if athletic brands use the same software and functional footwear concepts.¹⁸⁹ For example, Nike has a trademark for their “swoosh” symbol printed on most of their shoes and clothing, yet many competitors still sell similar products.¹⁹⁰

U.S.C. §1052 (2022) (stating trademarks are not given for functional things that are either utilitarian or aesthetic functionality).

184. See *Qualitex Co. v. Jacobson Prod. Co.*, 514 U.S. 159, 166 (1995) (citing *Inwood Laboratories, Inc. v. Ives Laboratories, Inc.*, 456 U.S. 844, 850 n.10) (“[A] product feature is functional,’ and cannot serve as a trademark, ‘if it is essential to the use or purpose of the article or if it affects the cost or quality of the article,’ that is, if exclusive use of the feature would put competitors at a significant non-reputation-related disadvantage.”).

185. See *id.* at 168–170 (holding colors can be trademarked if colors are not functional and can identify and distinguish and indicate source of goods).

186. See *Wal-Mart Stores v. Samara Bros.*, 529 U.S. 205, 216 (2000) (concluding product design is not inherently distinctive and requires secondary meaning to be considered trade dress in suit regarding children’s clothing designs).

187. See *Runtastic*, ADIDAS, <https://www.runtastic.com> [<https://perma.cc/S6PR-E8Q4>] (last visited Feb. 10, 2023); (advertising Adidas’s Runtastic App design and features); see also *Nike Run Club*, NIKE, <https://www.nike.com/nrc-app> [<https://perma.cc/Q5VN-797T>] (last visited Feb. 10, 2023) (advertising Nike Run Club app graphics).

188. See Lanham Act, 15 U.S.C. §1059 (2022) (permitting trademarks renewal every ten years if trademark is still in use); see also 15 U.S.C. §1127 (2022) (explaining trademarks must be used in commerce to reserve rights in mark).

189. See *In re Morton-Norwich Prods.*, 671 F.2d 1332, 1340–41 (C.C.P.A. 1982) (providing factors to evaluate utilitarian functionality (1) if there is utility patent that discloses utilitarian advantages of design, (2) advertising that advertises utilitarian advantages of design, (3) if there are alternative designs available, and (4) if design resulted from simple or inexpensive method of manufacture).

190. See *Gerben Trademark Library™: Nike Trademarks*, GERBEN (Mar. 23, 2023), <https://www.gerbenlaw.com/trademarks/footwear/nike/> [<https://perma.cc/L62E-YLYZ>] (listing various trademarks owned by Nike and noting that Nike “swoosh” is one of most famous trademarks today). *But see* Jasper Jolly, *Adidas Loses Three-Stripe Trademark Battle in European Court*, THE GUARDIAN (June 19, 2019), <https://www.theguardian.com/law/2019/jun/19/adidas-loses-three-stripe-trademark-battle-in-european-court> [<https://perma.cc/4YBT-7DEM>] (providing Adidas lost its trademark for its three-stripe logo in Europe after court held it was “not ‘distinctive’ enough”).

3. *Non-Disclosure Agreements*

NDAs could also be useful because they will keep new products that are still under development confidential.¹⁹¹ Instead of filing for provisional patent applications while coming up with a concept for a new show, companies can include NDAs in their transactions to protect their ideas.¹⁹² While inventors cannot file provisional applications for design applications, product inventors can utilize NDAs until the product is completed and ready for commercial sale.¹⁹³

Sports gear companies can benefit from three different types of NDAs while preparing to launch a new product.¹⁹⁴ First, employer-employee NDAs prevent employees from leaving the company and sharing valuable information.¹⁹⁵ Second, company-contractors NDAs allow companies to use contractors without risk.¹⁹⁶ Third, seller-buyer NDAs can prevent buyers from sharing confidential information and reverse-engineering a product.¹⁹⁷

191. See *4 Things You Should Know About Non-Disclosure Agreements*, THOMSON REUTERS (Mar. 11, 2022), <https://legal.thomsonreuters.com/en/insights/articles/4-things-to-know-about-non-disclosure-agreements> [<https://perma.cc/ZA5M-FXBT>] (explaining NDAs are used to ensure information will remain confidential between parties and are often used with investors, vendors, and suppliers).

192. See *id.* (mentioning NDAs are commonly used for marketing strategies and other valuable or sensitive information to avoid having employees share information with competitors); see also *How to Protect Your Intellectual Property With a Non-Disclosure Agreement*, THE MICHELSON INST. FOR INTELLECTUAL PROPERTY (Aug. 25, 2020), <https://michelsonip.com/intellectual-property-non-disclosure-agreement/> [<https://perma.cc/6TE5-SWS5>] (noting NDAs are “one of the single most important legal agreements you can use to protect your intellectual property”).

193. See *Provisional Application for Patent*, USPTO (June 24, 2022, 9:13 AM), <https://www.uspto.gov/patents/basics/types-patent-applications/provisional-application-patent> [<https://perma.cc/W63A-WFPS>] (providing USPTO will not grant provisional applications for design patents). *But see How to Protect Your Intellectual Property With a Non-Disclosure Agreement*, *supra* note 192 (illustrating NDAs can protect intellectual property instead).

194. See *What are All the Types of NDAs?*, TRESSLER, <https://tresslerassociates.com/what-are-all-the-types-of-ndas/> [<https://perma.cc/Y4UZ-WEF6>] (last visited Mar. 23, 2023) (listing different types of unilateral or one-way NDAs that businesses can benefit from).

195. See *id.* (noting employer-employees NDAs are one of most common types of NDAs).

196. See *id.* (sharing companies often “hire temporary contractors for . . . short-term project[s]”).

197. See *id.* (explaining seller-buyer NDAs can protect business operations, intellectual property, production processes, and computer technology); see also *Reverse Engineering*, CORNELL LAW SCHOOL, https://www.law.cornell.edu/wex/reverse_engineering [<https://perma.cc/CE7K-CW7R>] (last visited Jan. 2, 2023) (defining reverse engineering as “method or process of developing or manufacturing a known product” by “working backward[s]” or “taking apart . . . known product”).

NDAs provide another option for companies to confidently maintain confidential information regarding their athletic footwear.¹⁹⁸

IV. FINISHING THE RACE: CONCLUSION

Intelligent athletic footwear and trackable sensors in athletic equipment are gaining traction and are on trend to be a large consumer product in the coming future.¹⁹⁹ Athletes are already relying on biometrics provided by such equipment to supplement their training and conditioning.²⁰⁰ Many people already use wearable trackers and athletic footwear with sensors, even for general exercise.²⁰¹ Intelligent athletic footwear is on track to be a staple household item.²⁰² As a result, utility patent protection for intelligent athletic footwear is not the best choice.²⁰³ Intelligent footwear is better suited for design patents and trademark protection.²⁰⁴ Issuing patents for broad ideas such as intelligent athletic footwear systems and monitoring devices could lead to severe monopolization.²⁰⁵ A monopoly could hurt competition in the marketplace and impede the progress of science.²⁰⁶

198. For further discussion of NDAs, see *supra* notes 191–197 and accompanying text.

199. See *Fitbits of the Future: What's Next for Biometric Data in Health?*, *supra* note 159 (finding garments, shoes, jewelry, and watches with wearable biometric tracking technology are all new and upcoming areas of wearable fitness devices).

200. For further discussion of the importance of biometrics, see *supra* note 145 and accompanying text.

201. See Emily A. Vogels, *About One-In-Five Americans Use a Smart Watch or Fitness Tracker*, PEW RESEARCH CENTER (Jan. 9, 2020), <https://www.pewresearch.org/fact-tank/2020/01/09/about-one-in-five-americans-use-a-smart-watch-or-fitness-tracker/> [<https://perma.cc/YQL5-KTZ6>] (noting about 21% of adults use some type of wearable fitness device).

202. For further discussion of uses of wearable fitness trackers, see *supra* note 199 and accompanying text.

203. For further discussion of utility patent protection for intelligent footwear, see *supra* notes 30–44 and accompanying text.

204. For further discussion of design patents for intelligent footwear, see *supra* notes 62–72 and accompanying text.

205. See *General Information Concerning Patents*, *supra* note 17 (“By protecting intellectual endeavors and encouraging technological progress, the USPTO seeks to preserve the United States’ technological edge, which is key to our current and future competitiveness.”); see also Yaszko, *supra* note 164 (indicating patent owner of system for remotely detecting person’s activity level and method for non-intrusive health monitoring sued Adidas regarding its wearable fitness devices).

206. See Thoma, *supra* note 39 (explaining monopolies raise prices and lower production of goods and consumers need various products and goods to make market competitive). However, monopolies can have some benefit if there are multiple companies with a monopoly in the same market, creating a market that is “monopolistically competitive.” See *id.* (noting all monopolies are not and “a small degree of monopoly power may even be desirable.”).

The best way to provide athletic companies with the protection they seek while preventing the monopolization of abstract ideas is to look into other areas of intellectual property protection.²⁰⁷ Design patents are a good alternative to utility patent protection to avoid monopolization of an idea because they only protect the aesthetic design.²⁰⁸ Athletic companies can also utilize trademarks and NDAs to help protect unique intelligent footwear designs.²⁰⁹

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207. For further discussion of alternative options of protection, see *supra* notes 171–193 and accompanying text.

208. For further discussion of design patents, see *supra* notes 171–193 and accompanying text.

209. For further discussion of trademarks and NDAs, see *supra* notes 171–193 and accompanying text.

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