THE COLUMBIA
SCIENCE & TECHNOLOGY
LAW REVIEW

VOL. XIV STLR.ORG SPRING 2013

ARTICLE

THE INEXHAUSTIBLE RIGHT TO EXCLUDE REPRODUCTION DOCTRINE†

Eric J. Rogers*

The seed industry uses the combination of patent law and contract law to limit the use of patented seeds placed into the stream of commerce. This practice implicates both patent exhaustion and patent misuse. With respect to patent exhaustion, there is a dilemma: how to protect patent owners with self-replicating products while maintaining the principle of patent exhaustion. In Bowman, the Supreme Court offered a solution to the dilemma by creating a new technology-specific doctrine of patent exhaustion: the 'inexhaustible right to exclude reproduction.' This new doctrine simply sets the confines of the patent grant to include reproduction of an organism as infringing upon the patentee's right to make and largely fulfills the goals of patent exhaustion and patent misuse. However, the inexhaustible right to exclude reproduction doctrine creates patent rights that move forever with self-replicating products based on how the product is used. These property restrictions that 'run with the seeds' might catch the unwary downstream user, inhibit trade and add transaction costs. The creation of inexhaustible patent infringement liabilities with regard to patented organisms currently results in little harm to the public. However, as the volume of sales of patented organisms increases, this doctrine will pressure downstream

* J.D., Chicago-Kent College of Law, Certificate in Intellectual Property Law. Eric Rogers received his Ph.D. in Genetics from the University of Texas Southwestern Medical Center and conducted post-doctoral research in the Plant Molecular and Cellular Biology Laboratory in the Salk Institute. Mr. Rogers would like to thank Yee Chin Wah for useful suggestions.

users to expend increasing efforts in considering patent rights before acquiring any self-replicating property for the purpose of reproduction.

I. INTRODUCTION

The seed industry uses a combination of patent law and contract law to control and limit the use of patented seeds placed into the stream of commerce.[1] This practice implicates both patent exhaustion and patent misuse. Patent exhaustion is the legal principle that the authorized sale of an item exhausts certain patent rights with respect to that individual item.[2] Patent misuse is an equitable doctrine that prevents a patentee with unclean hands from enforcing patent rights with respect to any misused patent.[3]

Patent exhaustion poses a problem to patent owners' desire to sell patented self-replicating products like seeds. This is because a patented product's ability to self-replicate might result in the patent owner's loss of remuneration for their invention if—after a single, first sale—the patent owner has no right to control the reproduction of the patented product. Thus, patent owners of self-replicating products have strong incentives to try to avoid patent exhaustion. This has led the seed industry to use contract law to evade patent exhaustion and place post-sale restrictions on seeds enforceable using patent law.

Patent misuse is based on conduct that impermissibly broadens the physical or temporal scope of the patent grant with an unjustified anticompetitive effect.[4] Contracting around patent exhaustion may open the door to patent misuse because it is an attempt to broaden the patent right beyond the scope of the patent.[5] Therefore, a holding of patent misuse might depend on

---

1. *Monsanto Co. v. Bowman*, 657 F.3d 1341, 1343-1345 (Fed. Cir. 2011), aff'd in *Bowman v. Monsanto Co.*, 133 S. Ct. 1766 (2013); *Monsanto v. Scruggs*, 459 F.3d 1328, 1335-1336 (Fed. Cir. 2006); *Monsanto Co. v. McFarling*, 363 F.3d 1336, 1338-1341 (Fed. Cir. 2004); *Pioneer Hi-Bred Int'l, Inc. v. Ottawa Plant Food, Inc.*, 283 F. Supp. 2d 1018, 1023-1026 (N.D. Iowa 2003).

2. *Quanta Computer, Inc. v. LG Electronics, Inc.*, 553 U.S. 617, 625 (2008) ("The longstanding doctrine of patent exhaustion provides that the initial authorized sale of a patented item terminates all patent rights to that item."). In addition, the sale of an unpatented item can exhaust certain patent rights, including rights derived from process patents claims or later issued patents, if the sold product substantially embodies a patent claim.

3. *B. Braun Med., Inc. v. Abbott Labs.*, 124 F.3d 1419, 1427 (Fed. Cir. 1997) ("the patent misuse doctrine is an extension of the equitable doctrine of unclean hands, whereby a court of equity will not lend its support to enforcement of a patent that has been misused.").

4. *Princo Corp. v. Int'l Trade Commn.*, 616 F.3d 1318, 1326-1329 (Fed. Cir. 2010) (en banc); *Windsurfing Int'l v. AMF, Inc.*, 782 F.2d 995, 995 (Fed. Cir. 1986).

5. In addition, an unjustifiable anticompetitive effect must be shown. *See* Yina Dong, Student Note, *A Patent Exhaustion Exposition: Situating Quanta v.*

the threshold existence of patent exhaustion before a finding of an attempt to broaden patent rights outside the scope of a patent claim.

The concept of patent exhaustion aims to balance competing considerations. From the patentee's perspective, there is a desire to get the full value afforded by law for selling or licensing patented self-replicating products. For example, the seed industry wants to limit the use of second-generation seeds to protect their patent rights monopoly. On the other hand, the purpose of patent exhaustion is to prevent the perversion of public policies underlying the patent system, such as by preventing the over-reward of patentees and the taxing of downstream users.

At first blush, patent exhaustion would seem to occur upon the authorized sale of a patented organism such that the use of a sold patented organism to create progeny cannot incur patent infringement liability. Thus, patent exhaustion might be an effective defense to the creation or use of patent infringing progeny derived from an authorized sale of a patented parent. However, this traditional view of patent exhaustion severely diminishes the commercial viability of patented self-replicating products and undermines patent-based incentives to invent and develop self-replicating technologies. This is because a single, authorized sale has the potential of resulting in the production of unlimited "infringing progeny." Therefore, patent exhaustion could destroy virtually all commercial value in the patented invention outside of a single, first sale. In this situation, the patentee might only receive a single instance of remuneration after which "infringing progeny" could be made indefinitely without remuneration to the patentee.[6] Applying patent exhaustion to patented, self-replicating products in this way "would eviscerate the rights of the patent holder."[7]

This creates a dilemma: how to protect patent owners with self-replicating products while maintaining the principle of patent exhaustion. In addition, this raises the larger question of whether contracting around patent exhaustion or attempting to enforce

---

LGE in the Context of Supreme Court Jurisprudence, 2010 Stan. Tech. L. Rev. N2 at 63, 73 (2010); Geoffrey D. Oliver, *Princo v. International Trade Commission: Antitrust Law and the Patent Misuse Doctrine Part Company*, 25 SPG Antitrust 62, 63 (2011).

6. Jason Savich, *Monsanto v. Scruggs: The Negative Impact of Patent Exhaustion on Self-Replicating Technology*, 22 Berkeley Tech. L.J. 115, 115-16 (2007).

7. *Monsanto v. Scruggs*, 459 F.3d 1328, 1336 (Fed. Cir. 2006) ("Applying the first sale doctrine to subsequent generations of self replicating technology would eviscerate the rights of the patent holder.").

contract terms that avoid patent exhaustion violates any law or policy, such as the doctrine of patent misuse or contract law. The U.S. Court of Appeals for the Federal Circuit (Federal Circuit) has already provided an answer. The Supreme Court's decision in *Bowman* solidified a new doctrine of patent exhaustion: the inexhaustible right to exclude reproduction. But is this new doctrine a good solution? Bowman was granted certiorari by arguing that this new doctrine creates an exception for self-replicating technologies that goes against the principle of patent exhaustion and relies upon a flawed *Mallinckrodt* doctrine.[8]

This article will explore the law regarding patent exhaustion in the context of patented, self-replicating technologies. Part I provides examples of self-replicating entities that have been patented, with a focus on those entities commonly sold as products. Part II introduces the inexhaustible right to exclude reproduction doctrine while explaining the principle of patent exhaustion. Part III discusses the relationships between the doctrine of patent misuse and this new patent exhaustion doctrine. Part IV discuss how the Federal Circuit's inexhaustible right to exclude reproduction doctrine largely fulfills the goals of patent exhaustion and patent misuse with the exception of creating restrictions that move forever with personal property and may catch the unwary downstream user.

II. PATENTING SELF-REPLICATING INVENTIONS

The majority of self-replicating products sold or licensed for use in the marketplace are organisms. For example, millions of seeds of genetically modified plants, such as cotton, maize and soybeans, have been sold. These genetically modified plants are covered by patents owned by companies, most notably Monsanto Company (Monsanto) and E. I. du Pont de Nemours and Company (DuPont).[9] Many cell lines and viruses have been sold for use in biotechnology, such as baculoviruses covered by a patent owned by Monsanto.[10] In addition, patented DNA

8. Petition for a Writ of Certiorari, Bowman v. Monsanto Co., 2011 WL 6468161, *9-20.

9. Monsanto acquired Calgene in 1998, obtaining Calgene's patents related to transgenic plants that are glyphosate tolerant and DNA molecules capable of conferring glyphosate tolerance to plants. In 1999, DuPont acquired Pioneer Hi-Bred, who owned at least 17 patents related to transgenic maize. *J.E.M. Ag Supply, Inc. v. Pioneer Hi-Bred Int'l, Inc.*, 534 U.S. 124 (2001).

10. U.S. Patent No. 5,348,886 (filed Sep. 4, 1992). Monsanto licenses this patent to others, such as Life Technologies.

molecules are often contained within and replicated in products involving organisms and viruses.

A. Self-Replication Can Be Present in Both Living and Non-Living Entities

Currently, most self-replicating products are living organisms. However, it is important to realize that non-living things can have the capacity of self-replication and thus raise the same legal issues. The capacity for self replication also occurs in non-living things, such as viruses, ribozymes and prions (which might be designed using biotechnology) and molecular assemblies (which might be designed using nanotechnology).[11] The ideas presented in this article are not affected by the categorization of patented subject matter as living or non-living.

Most living organisms have the ability to reproduce, and sexual reproduction is the predominate mode among all species.[12] Asexual reproduction results in self-replication because progeny produced by asexual reproduction are genetically identical, or at least highly similar, to their parent.[13] On the other hand, while sexual reproduction does not strictly result in self-replication, multiple rounds of sexual reproduction can effectively result in self-replication. For example, isogenic strains of mice can be created by several rounds of selective breeding or by organism cloning.[14] Thus in principle, a sexual organism can be effectively replicated after multiple generations of controlled mating.

---

11. *See* Carothers JM, et al., *Model-driven Engineering of RNA Devices to Quantitatively Program Gene Expression*, 334 Science 1716, 1716-19 (Dec. 23, 2011); A. Ghasparian, et al., *Engineered Synthetic Virus-like Particles and their Use in Vaccine Delivery*, 12 Chembiochem 100 (2011); Piexuan Guo, *The Emerging Field of RNA Nanotechnology*, 5 Nat. Nanotech. 833 (Dec. 2010); Stefan Howorka, *Rationally Engineering Natural Protein Assemblies in Nanobiotechnology*, 22 Current Opinion on Biotech. 485 (June 2011); Guiseppe Legname, et al., *Synthetic Mammalian Prions*. 305 Science 673 (July 30, 2004).

12. *See* Barton NH, Charlesworth B, *Why Sex and Recombination?*, 281 Science 1986 (1998). Sterility occurs in some individuals and can be used as technological means to prevent patent infringement of patented organisms similar to copyright owners using digital rights management (DRM) to limit copyright infringement. *Infra* pt. IV(C)(5).

13. *See* Barton, *supra* n. 13.

14. *See* Dawn E. Watkins-Chow & William J. Pavan, *Genomic copy number and expression variation within the C57BL/6J inbred mouse strain*. 18 Genome Research 60 (2008); *see also* Narumi Ogonuki et al., *A High-Speed Congenic Strategy Using First-Wave Male Germ Cells*, 4 PLoS One e4943 (2009) (describing methods of creating genetically identical organisms except for a single genetic region).

Viruses, prions, ribozymes and transposons are examples of non-living entities that can exhibit self-replication. Viruses are adapted for replicating themselves and finding new host organisms, thereby spreading throughout the environment.[15] Similarly, transposons are nucleic acid sequences that can encode an enzyme that replicates its source sequence and can spread copies of its sequence both within a host organism's genome and also to a host organism's progeny.[16]

Ribozymes and prions are organic molecules that operate on a template molecule to produce a product resembling or identical to itself. A ribozyme (ribonucleic acid enzyme) is an RNA molecule that can catalyze a chemical reaction, e.g. RNA hydrolysis, thereby processing a RNA molecule substrate into an RNA molecule product.[17] If supplied with appropriate RNA substrates, ribozymes are capable of self-replication.[18] A prion is a protein molecule or protein complex that can alter the three-dimensional shape of other related proteins.[19] If supplied with appropriate substrate proteins, prions are capable of self-replication.[20]

B. What is Autonomous Self-Replication?

Self replication can be autonomous or non-autonomous. Autonomous self-replication occurs when an entity recreates itself using its own capabilities; non-autonomous self-replication occurs when an entity recreates itself with significant external assistance.

---

15. The line between living organisms and non-living objects is not clear. Generally, scientists define living organisms as having most of the characteristics in a set that includes metabolism, organization, homeostasis, growth, adaptation, response to stimuli and reproduction. Viruses straddle the definition of life because they exhibit some of the definitional characteristics, e.g. organization, adaptation and reproduction, but lack others, e.g. metabolism, homeostasis and growth. Viruses alternate between active and dormant phases. In the dormant phase, a virus lacks most of the characteristics of life; in its active phase, a virus can hijack a living cell's metabolism to reproduce itself. *See* Libia Herrero-Uribe, *Viruses, Definitions and Reality*, 59 Int'l J. Tropical Biology 993 (2011).

16. *See* Thomas Wicker, et al., *A Unified Classification System for Eukaryotic Transposable Elements*, 8 Nat Rev. Genetics 973 (Dec. 2007).

17. *See* Martin C. Wright & Gerald F. Joyce, *Continuous In Vitro Evolution of Catalytic Function*. 276 Science 614 (Apr. 25, 1997).

18. Tracey A. Lincoln & Gerald F. Joyce, *Self-sustained Replication of an RNA Enzyme*. 323 Science 1229 (Feb. 27, 2009).

19. E. Flechsig & C. Weissmann, *The Role of PrP in Health and Disease*. 4 Current Molecular Med. 337 (2004).

20. Joaquin Castilla, et al., *In Vitro Generation of Infectious Scrapie Prions*. 121 Cell 195 (Apr. 22, 2005).

This distinction is not relevant for living organisms, but it becomes important when considering non-living entities.

Many non-living entities can be replicated, but this property is not necessarily autonomous self-replication. For example, a DNA molecule can be replicated to produce an identical copy. However, DNA is not truly self-replicating because both the control and the means of reproduction, e.g. protein enzymes and nucleotide building blocks, are external to the DNA. However, non-autonomously replicating technologies, e.g. manmade DNA molecules, can be carried within autonomously replicating technologies, e.g. organisms or viruses, resulting in the autonomous replication of both.

Viruses, transposons and prions display the characteristics of autonomous self-replication. Viruses, transposons and prions are capable of spreading through the environment and directing their own reproduction by using hosts to obtain energy and materials.[21] These characteristics are similar to a bona fide organism's ability to gather resources and energy from the environment to facilitate its own reproduction. Active viruses, transposons and prions can control the means of their own reproduction and, thus, can be autonomously self-replicating objects.

Humankind has engineered artificial organisms, viruses, transposons, ribozymes and prions.[22] In addition, nanoscale and macroscale machines can be created that are capable of self-replication by gathering energy and resources to assemble a copy of themselves.[23] For example, self-assembling molecules can form identical structures when supplied with molecular components.[24] However, these molecules cannot actively seek out or create the

---

21. *See id.*; Wicker, *supra* n. 17; Flechsig, *supra* n. 20.

22. Carothers, *supra* n. 12; Sina Ghaemmaghami, et al., *Conformational Transformation and Selection of Synthetic Prion Strains*, 413 J. Molecular Biology527 (2011); Federico Mingozzi & Katherina A. High, *Therapeutic In Vivo Gene Transfer for Genetic Disease using AAV: progress and challenges*, 12 Nature Rev. Genetics 341 (May 2011); Warren C. Ruder, Ting Lu,& James J. Collins, *Synthetic Biology Moving into the Clinic*. 333 Science 1248 (Sep. 2, 2011); Timothy H. Bestor, *Transposons Reanimated in Mice*. 122 Cell 322 (Aug. 12, 2005); Legname, *supra* n. 12.

23. *See*, *e.g.*, U.S. Patent Nos. 4,734,856 (filed Mar. 2, 1984); 5,659,477 (filed Dec. 28, 1994); 5,764,518 (filed Nov. 25, 1996); and 6,510,359 (filed May 11, 2000).

24. Howorka, *supra* n. 12.

components required to autonomously assembly themselves once released into the environment.[25]

C. Patenting Self-Replicating Entities with Utility Patents

In 1980, the U.S. Patent and Trademark Office (USPTO) was compelled by the judiciary to consider patent-eligible a genetically engineered bacterium able to metabolize the hydrocarbons that would be found in a typical oil spill.[26] This strain of bacterium was created by the artificial introduction of exogenous genes that were then integrated into the bacterial genome.[27] A patent application attempting to claim the bacterium had been rejected by the USPTO for claiming ineligible subject matter under 35 U.S.C. § 101.[28] The Supreme Court, in a 5 to 4 decision in *Chakrabarty*, held living organism to be eligible subject matter because it did not exist in nature.[29] The Court held that a living, human-made microorganism can be categorized within the ambit of section 101 as a new and useful manufacture or composition of matter.[30] This decision is credited with opening the door for the practice of patenting various living organisms, cell lines, DNA molecules and viruses in the decades to follow.[31]

By the late twentieth century, the USPTO granted numerous utility patents claiming living organisms. In the 1980s, the U.S. granted patents that claimed living organisms such as 1) bacteria: oil eating Pseudomonas and ice-minus Pseudomonas;[32] 2) cell lines: human leukemia T-cells;[33] 3) animals: transgenic mammals expressing a human-made, activated oncogene[34] covering the mice branded as the OncoMouse™; and 4) transgenic plants, such as the Flavr-Savr tomato plant.[35] In 1987, the Board of Patent Appeals and Interferences decided that polyploid varieties of oysters were patent-eligible but rejected these patent claims for

---

25. *See* Lincoln, *supra* n. 19.

26. *Diamond v. Chakrabarty*, 447 U.S. 303, 303 (1980).

27. *Id.* at 305.

28. *Id.* at 306.

29. *Id.* at 310-318.

30. *Id.*

31. For example, U.S. Patent No. 4,514,497 (filed Dec. 30, 1983), issued in 1985, was one the first patents to claim an active virus.

32. U.S. Patent No. 4,432,160 (filed Aug. 20, 1981) (When "ice-minus" bacteria were sprayed on plants, the plants were more resistant to frost damage.).

33. U.S. Patent No. 4,438,032 (filed Jan. 6, 1983).

34. U.S. Patent No. 4,736,866 (filed June 22, 1984).

35. U.S. Patent No. 4,801,540 (filed Jan. 2, 1987).

being obvious.[36] By the 1990s, utility patents were being issued for numerous more types of laboratory mice and cell lines, as well as transgenic fish with improved resistance to pathogenic bacteria.[37]

D. Patenting Plants with Utility Patents

In 1982, a general agrobacterial vector with a Kanamycin selection marker was invented that allowed the addition of exogenous DNA sequences into plants.[38] In 1985, Calgene Inc. created a glyphosate resistant tobacco plant.[39] This technology allowed scientists to combine genetic material from widely dissimilar and unrelated organisms – for example, bacterial genes with alfalfa genes or chicken genes with maize genes. In other words, scientists can produce combinations of genetic material that have never before occurred in nature.[40] In the midst of a molecular biology revolution, the genetic engineering of plants became the "most rapid and enthusiastic adoption of technical innovation in the history of agriculture."[41]

After *Chakrabarty*, reservations remained about the eligibility of plants for utility patents. In 1985, the Board of Patent Appeals and Interferences decided that maize engineered to

---

36. *Ex parte Allen*, 2 U.S.P.Q.2d 1425 (B.P.A.I. 1987).

37. *See, e.g.*, U.S. Patent Nos. 5,175,384 (filed Dec. 25, 1988); 5,843,780 (filed Jan. 18, 1996); 5,998,698 (filed June 7, 1995); and 6,639,121 (filed July 19, 2000); and U.S. Patent Applications 2006/0265766 A1 (claiming omega-3 expressing fish, shrimp and other metazoans) and 2003/0051257 A1 (transgenic goat expressing hormone, human granulocyte-colony stimulating factor, for use as a human medicine).

38. U.S. Patent Nos. 4,536,475 (filed Oct. 5, 1982) and 4,407,956 (filed Mar. 13, 1981) (Previous vectors induced tumor formation when used to transform dicots. David Ow, et al., *Transient and stable expression of the firefly luciferase gene in plant cells and transgenic plants*, 234 Science 856 (1986). The earliest transgenic plants were petunias and tobacco plants. *See* A.J. Muller, et al, *High Meiotic Stability of a Foreign Gene Introduced into Tobacco by Agrobacterium-mediated transformation*, 207 Molecular & Gen. Genetics 171 (1987); Jonathan D. Jones, Pamela Dunsmuir & John Bedbrook, *High level expression of introduced chimaeric genes in regenerated transformed plants*, 4 EMBO J. 2411 (1985).

39. L. Comai, et al., *Expression in Plants of a Mutant aroA Gene from Salmonella typhim urium Confers Tolerance to Glyphosphate*, 317 Nature 741 (1985); *see* U.S. Patent Nos. 4,535,060 (filed Jan. 5, 1983) and 4,769,061 (filed Feb. 4, 1984).

40. Brief for Union of Concerned Scientists et al. Supporting Respondents at 7, *Monsanto Co. v. Geertson Seed Farms*, 130 S. Ct. 2743 (2010) (No. 09-475).

41. Marie-Monique Robin, The World According to Monsanto: Pollution, Corruption, and the Control of the World's Food Supply 194 (George Holoch trans., New Press 2010).

express high amounts of tryptophan was patent eligible.[42] This decision more clearly brought plants within the domain of eligible subject matter for utility patents; however, the utility patent eligibility of plants was challenged all the way up to the Supreme Court. In 2001, the Supreme Court held utility patents claiming plant germplasms to be subject matter eligible, thereby ending the uncertainty regarding the eligibility of plants for utility patents.[43]

By the late 1990s, the genetic engineering of plants had become widespread, as had efforts to claim artificially designed plants using utility patents. Currently, the predominant means to directly modify the genome of a plant are the insertion of human-made, chimeric DNA via 1) bacterial-mediated transformation or 2) biolistics, i.e. micro-particle bombardment.[44] These techniques have been used to directly engineer plant varieties that resist insects, drought, herbicides, salinity, cold and diseases, as well as to produce crops with increased nutrition; with properties that facilitate processing into biofuel; and with high levels of compounds to be used in pharmaceuticals or other commercial products, such as the paper and detergent industries.[45] In the marketplace, the most widely sold patented plants are transgenic crops engineered to be resistant to herbicides, such as glyphosates, and/or to produce pesticides, such as Bt toxins.

1. EPSPS Expressing Transgenic Plants

In 1974, Monsanto patented the herbicide Roundup®.[46] The active ingredient of Roundup® is a glyphosate that inhibits plant growth by interfering with the biosynthesis of aromatic amino acids.[47] While Monsanto marketed Roundup®, it began patenting various DNA molecules and plant seed germplasms as part of its

---

42. *Ex parte Hibberd*, 227 USPQ 443 (B.P.A.I. 1985) (This decision was adopted by the USPTO in a Notice from the Commissioner of Patents issued in October, 1985).

43. *J.E.M. Ag. Supply*, 534 U.S. 124, at 143-46 (2001).

44. Shyamkumar Barampuram & Zhanyuan J. Zhang, *Recent Advances in Plant Transformation*, 701 Methods Molecular Biology 1 (2011).

45. Brief for the Biotechnology Industry Organizations as Amicus Curiae in Support of Neither Party at 7-8, *Quanta Computer, Inc. v. LG Electronics, Inc.*, 553 U.S. 617 (2008) (No. 06-934); Brief of CropLife International as Amicus Curiae in Support of Neither Party at 2, *Quanta*, 553 U.S. 617..

46. U.S. Patent 3,799,758 (filed Aug. 9, 1971) (herbicidal activity of glyphosate was discovered by Dr. John Franz in 1970 while working at Monsanto).

47. *Id.*

Roundup Ready® technology.[48] Transgenic plants that express a bacterial 5-enolpyruvyl shikimate-3-phosphate synthase (EPSPS) enzyme are resistant to glyphosates.[49] Monsanto created various EPSPS-expressing transgenic plants, such as soybeans, marketed as Roundup Ready® plants.[50] When used together, Monsanto's Roundup® inhibits the growth of most other plants (i.e. weeds) with little effect on Monsanto's Roundup Ready® plants.[51] Monsanto owns utility patents claiming most of these plants and the synthetic DNA molecules and traits they contain, as well as methods of creating these transgenic plants.[52] In 1996, Monsanto first sold Roundup Ready® seeds.[53] In 2009, Monsanto released Roundup Ready 2 Yield®.

2. Bt Toxin Expressing Transgenic Plants

In 1985, a tobacco plant was genetically engineered to express a Bt toxin that conferred the plant with reduced susceptibilities to some insects.[54] Bt toxins are natural products of the soil bacterium *Bacillus thuringiensis*.[55] Bt toxins are crystal proteins encoded by *cry* genes that can be introduced into transgenic plants for heterologous expression in order to confer insect resistance.[56] Numerous *cry* genes have been patented by

48. David Barboza, *A Weed Killer Is a Block to Build on*, N.Y. Times (Aug. 2, 2001).

49. Todd Funke, et al., *Molecular Basis for the Herbicide Resistance of Roundup Ready Crops*, 103 Proc. Nat'l Acad. Sci. 13010 (Aug. 29, 2006).

50. *Id.*

51. Stephen O. Duke & Stephen B. Powles, *Glyphosate: a once-in-a-century herbicide*, 64 Pest Mgmt. Sci. 319 (2008).

52. *See* U.S. Patent Nos. 4,940,835 (filed July 7, 1986); 4,971,908 (filed Apr. 22, 1988); 5,034,322 (filed Apr. 5, 1989); 5,145,783 (filed July 9, 1990); 5,188,642 (filed Feb. 12, 1990); 5,310,667 (filed July 17, 1989); 5,352,605 (filed Oct. 28, 1993); 5,589,583 (filed Jan. 11, 1990); and 5,633,435 (filed Sept. 14, 1994).

53. *Monsanto Co. v. Scruggs*, 249 F. Supp. 2d 746, 750 (N.D. Miss. 2001).

54. Mark Vaeck, et al., *Transgenic Plants Protected From Insect Attack*, 328 Nature 33 (1987).

55. *Id.*

56. Juan J. Estruch, et al., *Transgenic Plants: An Emerging Approach to Pest Control.* 15 Nat. Biotech. 137 (1997).

various entities.[57] In 1996, Monsanto first sold seeds of Bt toxin-expressing cotton under the trade name Bollgard®.[58]

The use of these genetically modified agricultural crops is not insignificant, accounting for about 17% of U.S. farmland in 2009.[59] Monsanto licenses the sale of its patented Roundup Ready® soybeans, maize, cotton, canola, alfalfa and sugar beet, as well as Bollgard® versions of some of these crops, and is awaiting government approval for Roundup Ready® wheat, potato and rice.[60] In 2010, Monsanto's patented technology was estimated to be embodied in 80% to 90% of all soybeans, maize and cotton grown in the United States.[61]

III. PATENT EXHAUSTION AND THE INEXHAUSTIBLE RIGHT TO EXCLUDE REPRODUCTION DOCTRINE

Self-replicating technologies are relatively new to patent law[62] and present unique problems with regard to patent exhaustion.[63] Genetically-engineered plants covered by utility

57. Changlong Shu & Jie Zhang, *Current Patents Related to Bacillus thuringiensis Insecticidal Crystal Proteins*, 3 Recent Patents DNA & Gene Sequences 26 (Sep. 24, 2009).

58. Frederick J. Perlak, et al., *Development and Commercial Use of Bollgard Cotton in the USA – early promises versus today's reality*, 27 Plant J. 489 (2001).

59. Clive James, Brief 41: Global Status of Commercialized Biotech/GM Crops: 2009 at 4, (Int'l Service for the Acquisition of Agri-Biotech Applications) (2009) (64 million hectares out of about 380 million hectares are planted with genetically modified crops).

60. http://en.wikipedia.org/wiki/Roundup_(herbicide) (retrieved Jan. 18, 2012).

61. Scott Kilman, *Monsanto Draws Antitrust Scrutiny*, Wall Street Journal (Mar. 11, 2010); Genetically Modified Plants: Global Cultivation Area, GMO Compass, http://www.gmo-compass.org/eng/agri_biotechnology/gmo_planting/341.genetically_modified_maize_global_area_under_cultivation.html; http://www.gmo-compass.org/eng/agri_biotechnology/gmo_planting/342.genetically_modified_soybean_global_area_under_cultivation.html; http://www.gmo-compass.org/eng/agri_biotechnology/gmo_planting/343.genetically_modified_cotton_global_area_under_cultivation.html, (retrieved January 18, 2012).

62. Although organisms could be patented in the U.S. since the Plant Patent Act of 1930, patent infringement litigation involving utility patents claiming organisms began in the 1990s.

63. *See Monsanto Co. v. Scruggs*, 249 F. Supp. 2d 746, 750 (N.D. Miss. 2001) ("Roundup Ready® seed technology was first marketed commercially in time for the 1996 planting season."); Clive James, Brief 12: Global Review of Commercialized Transgenic Crops, (Int'l Service for the Acquisition of Agri-biotech Applications) (1999) (noting a greater than 20-fold increase in transgenic

patents became widely used in agriculture by the end of the twentieth century. Today, plants are the most prominent examples of patented, self-replicating products in the marketplace. For example, many patented organisms, such as transgenic soybeans, can reproduce to generate patent-infringing progeny. In addition, patented DNA molecules inserted into plant genomes, and the patented plant traits conferred by these DNA molecules, can be re-created in the progeny of plants. These problems are exemplified in the cases presented in this section.

A. The Principle of Patent Exhaustion

More than a century before utility patents were granted for self-replicating subject matter, the Supreme Court of the United States opined that patent rights may be exhausted upon sale.[64] Patent exhaustion is the legal principle that the first authorized and unrestricted sale of a patented item exhausts certain patent rights in that individual item with respect to its ordinary useful life.[65] Patent exhaustion also exhausts patent rights upon the authorized sale of an item that merely embodies essential features of a patent, such as a process patent, when the only reasonable and intended use for the item is to practice that patent.[66] The exhaustion of a patent

---

crops planted globally, from 1.7 million hectacres of transgenic crops planted in 1996 to 39.9 million hectares planted in 1999); *see also* James, *supra* n. 60, at 6 (noting a 74-fold increase in global planting of transgenic crops, from 1.7 million hectares in 1996 to 125 million hectares in 2008).

64. *Bloomer v. McQuewan,* 55 U.S. 539, 549-550 (1853) (When a "machine passes to the hands of the purchaser, it is no longer within the limits of the monopoly. It passes outside of it, and is no longer under the protection of the act of Congress.").

65. *Quanta Computer, Inc. v. LG Electronics, Inc.*, 553 U.S. 617, 625 (2008).

66. *Quanta*, 553 U.S. at 628-635; *Hewlett-Packard Company v. Repeat-O-Type Stencil Mfg. Corp., Inc.,* 123 F.3d 1445, 1451 (Fed. Cir. 1997) (The purchaser "has an implied license under any patents of the seller that dominate the product or any uses of the product to which the parties might reasonably contemplate the product will be put."). In addition, an express license to practice a patent may create an implied license to practice a patent that had not issued or even been applied for at the time. *Transcore, LP v. Elect. Transaction Consultants Corp.*, 563 F.3d 1271 (Fed. Cir. 2009). Furthermore, *Transcore* suggests that a patentee's conduct might exhaust future patent rights based on the reasonable and intended use of a product sold in the past.

right is available as an affirmative defense to patent infringement and can be raised in a declaratory judgment action.[67]

1. The Traditional Principle of Patent-Exhaustion

In *Univis*, the Supreme Court articulated the patent-exhaustion doctrine: once a patentee has received his reward for the use of his invention by the sale of the article, then patent law affords no basis for restraining the use and enjoyment of the thing sold.[68] A patentee's "monopoly remains so long as he retains the ownership of the patented article. But sale of it *exhausts* the monopoly in the article and the patentee may not thereafter, by virtue of his patent, control the use or disposition of the article."[69] The Court explained that upon authorized sale of an invention—or any article that is capable of use only in practicing a patent—for full consideration and compensation, the patentee relinquishes the patent monopoly with respect to that invention or article.[70] The overarching rationale of *Univis* is based on the concept that the "purpose of the patent law is fulfilled with respect to any particular article when the patentee has received his reward for the use of his invention by the sale of the article, and, once that purpose is realized, the patent law affords no basis for restraining the use and enjoyment of the thing sold."[71]

In *Univis*, the Supreme Court applied a two prong substantial embodiment test to determine whether a sold, non-

---

67. *ExcelStor Technology, Inc. v. Papst Licensing GMBH & Co.*, 541 F.3d 1373, 1376 (Fed. Cir. 2008) ("patent exhaustion is a defense to patent infringement, not a cause of action").

68. *United States v. Univis Lens Co.,* 316 U.S. 241, 251 (1942). Another articulation of patent exhaustion is "That is to say, the patentee or his assignee having in the act of sale received all the royalty or consideration which he claims for the use of his invention in that particular machine or instrument, it is open to the use of the purchaser without further restriction on account of the monopoly of the patentees." *Adams v. Burke*, 84 U.S. 453, 456 (1873).

69. *Univis,* 316 U.S. at 250 (emphasis added).

70. *Id.* at 249-252.

71. *Id.* at 251-252 ("The first vending of any article manufactured under a patent puts the article beyond the reach of the monopoly which that patent confers."). The Court's reasoning echoed *Bauer* and *Keeler.* A patentee's receipt of consideration for the use of an invention is receipt of "every benefit of that monopoly which the patent law secures to him." *See Bauer v. O'Donnell*, 229 U.S. 1, 17 (1913) ("The right to vend conferred by the patent law has been exercised, and the added restriction is beyond the protection and purpose of the act."); *Keeler v. Standard Folding Bed Co.*, 157 U.S. 659, 664 (1895) (Once a patentee "receives the consideration for [their patented product's] use" then the patentee "parts with the right to restrict that use") (citing *Adams*, 84 U.S. at 456).

infringing article exhausted any patent rights.[72] The reasonable and intended use prong is an inquiry into the intended use of the article, either explicitly or implicitly, manifested in the transaction of its sale. The essential features prong is an inquiry into whether the article embodies any essential features of a patented invention. In addition, the Court argued that the authorized sale of unfinished components conferred an implied license to purchasers to use the article to make the patented product, and thus to practice the patent.[73]

In summary, patent exhaustion occurs with respect to certain patent rights in an individual product only when there is an authorized and unconditional sale and the patentee has received their reward for the patent right exhausted. Thus, patent exhaustion requires 1) an authorized and 2) unconditional[74] 3) conveyance of tangible property that embodies patent rights, and 4) for which the patentee has been compensated for the patent right exhausted.[75] Furthermore, a contractual condition is not enforceable under patent law if the condition was not related to subject matter within the scope of a patent or "the performance of which is reasonably within the reward which the patentee by the grant is entitled to secure."[76]

2. The Federal Circuit's Patent-Exhaustion Doctrine

---

72. *Univis*, 316 U.S. at 249-251.

73. *Id.*

74. *See United States v. Gen. Elec. Co*, 272 U.S. 476, 490 (1926) (The patentee "restricts the property and interest the licensee has in the goods [the licensee] makes and proposes to sell."); *Motion Picture Patents Co. v. Universal Film Co.*, 243 U.S. 502, 516 (1917) ("exhausted by a single, unconditional sale"); *Bauer*, 229 U.S. at 619 ("a qualified sale"); *Adams*, 84 U.S. at 455 (the sale of the patented article was "without condition or restriction"); *Scruggs* at 1335-1336 ("The first sale/patent exhaustion doctrine establishes that the unrestricted first sale by a patentee of his patented article exhausts his patent rights in the article."); *B. Braun Med.*, 124 F.3d at 1426 ("an unconditional sale of a patented device exhausts the patentee's right to control the purchaser's use of the device thereafter"). After *Quanta*, the Federal Circuit did not think that the *Mallinckrodt* doctrine should be changed. *Princo*, 616 F.3d at 1328; *see also* Amelia Rinehart, *Contracting Patents: A Modern Patent Exhaustion Doctrine*, 23 Harv. J.L. & Tech. 483, 513-514 (2010).

75. The property conveyed does not need to be patented but must substantially embody essential features of a patented invention and the conditions of the sale must reasonably intended for the purchaser to practice a patent claim.

76. *Gen. Elec. Co.*, 272 U.S. at 489.

After *Univis*, the Supreme Court issued no new holdings with regard to patent exhaustion for the remainder of the twentieth century. However, in the 1990s, the Federal Circuit began enforcing more and more post-sale restrictions using patent law if the restrictions did not violate antitrust law or "some other law or policy."[77] The Federal Circuit found Supreme Court precedent to support these holdings.[78] For example, *General Talking Pictures* held "patent owners may grant licenses extending to all uses or limited to use in a defined field."[79] The Supreme Court asserted that "[t]he property right to a patented machine may pass to a purchaser with no right of use, or with only the right to use in a specified way, or at a specified place, or for a specified purpose" so long as the purchaser has "notice that he buys with only a qualified right of use."[80]

The Supreme Court suggested that post-sale restrictions were enforceable by a patentee using patent law so long as the restrictions "are normally and reasonably adapted to secure pecuniary reward for the patentee's monopoly."[81] Thus, if the situation is legally characterized as a licensor-licensee situation, the patentee may limit the price and/or method of sale because the licensing of patent rights does not convey to the licensee an absolute interest in the patented products they create or obtain title to. "The fact that the conditions in the contracts keep up the monopoly or fix prices does not render them illegal."[82] "[A] patentee may not attach to the article made by him or with his consent a condition running with the article in the hands of purchasers limiting the price at which one who becomes its owner for *full consideration* shall part with it."[83] But a patentee may limit their licensee "as to the prices at which the latter shall sell articles which he makes and only can make legally under the license."[84]

3. The *Mallinckrodt* Doctrine – Mallinckrodt, Inc. v. Medipart, Inc. (Federal Circuit 1992)

77. *See, e.g., Mallinckrodt, Inc. v. Medipart, Inc.*, 976 F.2d 700, 708 (Fed. Cir. 1992).

78. *Bement v. National Harrow Co.*, 186 U.S. 70, 91 (1902).

79. *Gen. Talking Pictures v. W. Elec. Co.*, 304 U.S. 175, 181 (1938).

80. *Henry v. A.B. Dick Co.*, 224 U.S. 1, 24-26 (1912) (overruled in *Quanta Computer, Inc. v. L.G. Elecs., Inc.*, 553 U.S. 617, 626 (2008)).

81. *Gen. Elec.*, 272 U.S. at 490.

82. *Id.* at 491 (citing *Bement*, 186 U.S. at 70).

83. *Id.* at 494 (emphasis added).

84. *Id.*

Patent exhaustion can prevent patent law from being used to enforce certain contractual terms. However, the Federal Circuit's reasoning in *Mallinckrodt* allows patentees to use contracts to prevent patent exhaustion via terms defining an authorized sale and enforce post-sale restrictions using patent infringement actions.

Mallinckrodt made and sold a patented medical nebulizer called UltraVent.[85] The UltraVent was used to deliver drugs or radioactive material in aerosol form to the lungs of patients for the treatment of diseases or to assist medical diagnostic imaging. Mallinckrodt attempted to impose a "single use" restriction on its nebulizers by placing a notice on the device and its packaging. However, some purchasers, generally hospitals, paid Medipart to "recondition" used UltraVent nebulizers for repeated use, which violated the restriction inscribed on the device. Medipart would clean, repair and sterilize used nebulizer parts before repackaging them for return to the original purchasers.[86]

When Mallinckrodt sued Medipart for patent infringement and induction of patent infringement, Medipart raised the affirmative defense of patent exhaustion, as well as arguments along the lines of patent misuse and violation of antitrust law.[87] The district court held that this single-use restriction could not be enforced under patent law. The district court reasoned that the formalities distinguishing sale versus license did not change the substance of the transaction, which the court held to be a sale.[88] Thus, Mallinckrodt's sale of the devices, being an unrestricted sale, exhausted Mallinckrodt's patent rights in the sold devices. Furthermore, the court reasoned that public policy is served by preventing a patent monopoly from being extended or abused to anticompetitive effect.[89]

---

85. *Mallinckrodt, Inc. v. Medipart, Inc.*, 976 F.2d 700, 701-02 (Fed. Cir. 1992).

86. *Id.* The UltraVent was capable of trapping and retaining hazardous materials, such as radioactive material, from the exhalate.

87. *Id.* at 703-704 ("Medipart states that the restriction is unenforceable, for the reason that 'the *Bauer* trilogy and *Motion Picture Patents* clearly established that *no* restriction is enforceable under patent law

upon a purchaser of a sold article.' (Medipart's emphasis)"). The *Bauer* trilogy refers to *Bauer v. O'Donnell*, 229 U.S. 1 (1913); *Straus v. Victor Talking Machine Co.*, 243 U.S. 490 (1917); and *Boston Store of Chicago v. Am. Graphophone Co.*, 246 U.S. 8 (1918).

88. *Mallinckrodt*, 976 F.2d at 703-704.

89. *Id.* at 706 (The district court "refuse[s] to limit *Bauer* and *Motion Picture Patents* to tying and price-fixing not only because their language suggests broader application, but because there is a strong public interest in not

The Federal Circuit reversed by holding that patent rights were not exhausted when the sale was conditioned on terms permissible by law and equity.[90] The court found immaterial Medipart's argument that patent exhaustion occurred because the product was purchased from the patentee and not its licensee, which should be, by definition, an authorized sale. In other words, an authorized sale is not sufficient to trigger patent exhaustion. In addition, the court warned that the viability of a restriction should not turn on the difference between a patentee and licensee. The Federal Circuit emphasized that the principle of patent exhaustion does not transform a purported conditional sale into an unconditional sale.[91]

The Federal Circuit held that patent exhaustion did not apply when the sale was conditioned by licensing terms that restrict use, so long as the restriction does not violate some other law or policy.[92] The court reviewed a variety of Supreme Court precedents and concluded that the consistent thread was "the rule of contract law that sale may be conditioned." The court started with the premise that private parties are generally free to agree to any contract terms concerning the conditioned sale of a patented product, and the judiciary should enforce such terms, which are not in their very nature illegal.[93]

The Federal Circuit reviewed the case law to explain which restrictions on sale are permissible and which are not.[94] The court explained that *General Talking Pictures* showed post-sale restrictions are enforceable by a patent infringement action if the restriction is judged to be within the patent grant and scope of the claims. The court reasoned that precedent required restrictions on sale to be *per se* unenforceable only in fact patterns where the price was fixed, as in *Bauer*, or there was patent-enforced product tying, as in *Motion Picture Patents*.[95]

---

stretching the patent laws to authorize restrictions on the use of purchased goods").

90. *Id.* at 708-709.

91. *Id.* at 703-709.

92. *Id.* at 708-709.

93. *Id.*

94. *Id.* at 704-708.

95. *Id.* at 706-709. The Federal Circuit confounded the concepts of patent exhaustion and patent misuse. The Federal Circuit suggested that price fixing was *per se* illegal for passing beyond the scope of the patent grant based on the precedent in *Bauer*. However, *Bauer* held that the price fixing arrangement was unenforceable due to patent exhaustion. In other words, price fixing is possible within the scope of the patent grant. *Mallinckrodt* should have been decided

The Federal Circuit noted that field-of-use restrictions on patented products had been enforced using patent infringement actions where the restriction was not considered patent misuse or an antitrust violation.[96] The court explained that the "appropriate criterion is whether Mallinckrodt's restriction is reasonably within the patent grant" and the patentee's statutory right to exclude.[97] If "the restriction be found to be reasonably within the patent grant" that ends the inquiry.[98] The court held that patent law can be used to enforce the restriction if the sale of the UltraVent was "validly conditioned" and the restriction on reuse was "within the scope of the patent grant or otherwise justified."[99]

This gave rise to the *Mallinckrodt* doctrine: a patentee can use patent infringement to enforce post-sale restrictions, at least right-to-use restrictions expressly accepted at the time of sale, against the purchaser of a patented product, unless the restriction enlarges the scope of the patent grant with anticompetitive effect. Furthermore, the finding of an anticompetitive effect is not sufficient to render the restriction unenforceable unless 1) the anticompetitive effect is not out-weighed by procompetitive effects under the rule of reason balancing test or 2) the anticompetitive effect is conclusively presumed unreasonably anticompetitive because the conduct is *per se* illegal, e.g. price-fixing or tying arrangements.[100] The Federal Circuit treated the principle of patent exhaustion as irrelevant if a sale is qualified or conditional, and thus, patent exhaustion could be legally avoided at the patentee's discretion using contract terms.[101]

---

solely on the principle of patent exhaustion. Similarly, the Federal Circuit implied that all tying arrangements were *per se* illegal for expanding beyond the scope of the patent grant based on the precedent in *Motion Picture Patents*. However, the *Motion Picture Patent* Court may have upheld the tying arrangement if both the tying and tied products were patented, by considering the arrangement within the scope of the patent law.

96. *Mallinckrodt*, 976 F.2d at 706-709 (noting that single use restriction was held enforceable in patent infringement action in *Marks, Inc. v. Polaroid Corp.*, 237 F.2d 428, 436 (1st Cir. 1956)).

97. *Id.* at 708.

98. *Id.*

99. *Id.* at 709.

100. In antitrust law, there no longer is a presumption of market power in a tying arrangement using a patented product. *Illinois Tool Works Inc. v. Independent Ink, Inc.*, 547 U.S. 28, 31 (2006).

101. Such express conditions, however, are contractual in nature: thus they are subject to antitrust, patent, contract, and any other applicable laws, as well as equitable considerations, such as patent misuse.

Under the *Mallinckrodt* doctrine, patent exhaustion could be prevented using contracts and patent owners could sue for patent infringement to enforce post-sale restrictions within the scope of their patent rights. The Federal Circuit's standard for whether or not a restriction was enforceable under patent law was if the restriction was reasonably within the patent grant, i.e. was related to subject matter within scope of patent claims.[102] A post-sale restriction was unenforceable if the restriction ventured beyond the scope of the patent grant and had an anticompetitive effect not justifiable under the rule of reason.[103] In addition, a post-sale restriction was unenforceable if it violated any other law or policy, e.g. contract law, antitrust law or equitable considerations, such as patent misuse.[104]

The Federal Circuit's reasoning in *Mallinckrodt* suggests that patentees can use patent infringement actions to enforce post-sale restrictions generally. Prior to this, the Supreme Court had enforced limited restrictions imposed on licensees by duration, field-of-use, geographic boundary and resale price.[105] However, the judiciary has intimated that various general post-sale restrictions are enforceable, such as limitations on 1) repair, 2) modification, 3) field-of-use, and 4) withholding the right to sell altogether.[106]

The Federal Circuit's approach allowed patentees to rely on contract law to define what is an authorized sale in order to prevent patent exhaustion. Often, litigation involving patent exhaustion has turned on the terms of a contract that defined a licensee's authorization to sell a patented product. Patent exhaustion might be explained as a way to refuse patent law

---

102. *Mallinckrodt*, 976 F.2d at 703.

103. *Id.* at 708.

104. *Id.*

105. Andrew T. Dufrense, *The Exhaustion Doctrine Revived? Assessing the Scope and Possible Effects of the Supreme Court's Quanta Decision*, 24 Berkley Tech. L.J. 11, 16-18 (2009); Tyler Thorpe, *Testing the Limits of Patent Exhaustion's "Authorized Sale" Requirement Using Current High-Tech Licensing Practices*, 50 Santa Clara L. Rev. 1017, 1023-1024 (2010).

106. *See Gen. Talking Pictures v. W. Elec. Co.*, 304 U.S. 175, 182 (1938); *Arizona Cartridge Remanufacturer's Ass'n v. Lexmark Int'l, Inc.*, 421 F.3d 981, 986-987 (9th Cir. 2005) ("even repair of an unlicensed device [a conditionally sold device] constitutes infringement" citing *Mallinckrodt*, 976 F.2d at 709); *Hewlett-Packard Co. v. Repeat-O-Type Stencil Mfg. Corp.*, 123 F.3d 1445 (Fed. Cir. 1997) (holding that if the restriction is embodied in an enforceable contract, then a purchaser's right to use, sell or modify a patented product can be limited); *Pioneer Hi-Bred Int'l, Inc. v. Ottawa Plant Food, Inc.*, 283 F. Supp. 2d 1018, 1031-1039 (N.D. Iowa 2003) (holding a license limited the resale of patented corn seed).

remedies for a contract issue about the terms of a "sale; in this way, it moves us away from patent law and, more appropriately, on to the principles of contract, property, and antitrust law."[107]

4. What is an Authorized Sale?

The principle of patent exhaustion can be described as arising from the government-granted, exclusive right to sell given to the patentee. Once a patentee exercises this exclusive right to exploit its patented invention, such as through a sale or authorized sale via a licensee or assignee, then the scope of the patent grant is maintained by exhaustion of certain, exclusive patent rights with regard to the object of the sale.[108]

An authorized sale is a conveyance of property by a party with the legal right to make the sale, for which the patentee has been paid consideration. The meaning of "authorized" is straightforward. The difference between authorized and unauthorized is whether the seller could be held liable for patent infringement by the transfer of the property.[109] Thus, all patentees make authorized sales of their patented products because one cannot exclude oneself from exercising a patent right. Furthermore, any assignee or licensee with the right to sell an object embodying patented subject matter creates an authorized sale upon the conveyance of title in the object.

However, when a licensee without the right to sell a patented product makes a sale, then the licensee who sells the product and the purchaser who uses the product both can be held liable for patent infringement.[110] This is the legal effect of an unauthorized sale. A patent right is not exhausted by the unauthorized sale by a licensee of a patented product or product that substantially embodies patent rights when the restriction on authorization is within the scope of the patent grant.

There is a legal onus on purchasers of patented products or products that substantially embody patent rights. A purchaser can avoid patent infringement liability by ensuring the seller has the

---

107. *Static Control Components, Inc. v. Lexmark Int'l, Inc.*, 615 F. Supp. 2d 575, 579 (E.D. Ky. 2009).

108. *See* Brief of the United States as Amicus Curiae in Support of Petitioners at 8-15, *Quanta Computer, Inc. v. L.G. Elecs., Inc.*, 553 U.S. 617 (2008). The exclusive patent right to make is generally not exhausted. *Infra* pt. II (A)(5).

109. *Transcore, LP v. Elect. Transaction Consultants Corp.*, 563 F.3d 1271, 1276-77 (Fed. Cir. 2009).

110. *Gen. Talking Pictures*, 304 U.S. at 180-182.

right to sell the patented product for the use contemplated by the purchaser. If "a licensee has made an unauthorized sale outside the scope of its license, the downstream purchaser infringes even if it lacks notice that the licensee is acting in an unauthorized manner."[111] The strict liability of patent infringement means that a purchaser of a product in an unauthorized sale may be held liable for patent infringement because "the law imposes the risk upon the purchaser, as against the real owner, whether the title of the seller is such that he can make a valid conveyance."[112]

5. What is a Conditional Sale?

Like any property right, patent rights can be assigned, sold, licensed, divided, abandoned and conveyed by gift, will or descent. For example, the right to make, the right to sell and the right to use may be granted or conferred separately by the patentee.[113] Severing the right to use from other patent rights allows a licensee to purchase a "portion of the franchise which the patent confers" but not all the rights.[114] For example, "[t]he patentee may make and grant a license to make and use the patented articles but withhold his right to sell them."[115]

The Supreme Court has explained that a patentee can make a sale of a patented thing with or without conditions.[116] When a patentee makes a sale of a patented product without conditions, i.e. where the sale is absolute, then the purchaser may continue to use the patented product "in same manner as if dealing with property of any other kind."[117] But when restrictions are placed upon the purchased patented product, then the sale is either conditional or is not a sale at all but instead a limited license of patent rights. Restrictions can be placed upon the purchased patented products by patentees and their assignees or licensees.

The theory behind patent exhaustion after an unconditional sale "is that in such a transaction, the patentee has bargained for, and received, an amount equal to the full value of the goods."[118]

---

111. Brief of the Int'l Bus. Machs. Corp. as Amicus Curiae in Support of Petitioners at 16, *Quanta*, 553 U.S. 617 (2008).

112. *Mitchell v. Hawley*, 83 U.S. 544 (1873).

113. *Brulotte v. Thys Co.*, 379 U.S. 29, 31 (1964).

114. *Bloomer v. McQuewan*, 55 U.S. 539, 549 (1853).

115. *United States v. Gen. Elec. Co*, 272 U.S. 476, 490 (1926).

116. *Mitchell*, 83 U.S. at 548.

117. *Id.* at 541.

118. *B. Braun Med., Inc. v. Abbott Labs.*, 124 F.3d 1419, 1426 (Fed. Cir. 1997).

Thus, patent exhaustion does not occur after a conditional sale because "it is more reasonable to infer that the parties negotiated a price that reflects only the value of the 'use' rights conferred by the patentee."[119] Tautologically, a conditional sale does not become unconditional because of patent exhaustion – the restrictions imposed at time of sale to which the purchaser is on notice can prevent the occurrence of patent exhaustion by the mere acceptance of the condition of sale.[120] Under the *Mallinckrodt* doctrine, "express conditions accompanying the sale or license of a patented product are generally upheld."[121]

The distinction between a sale and a conditional sale generally is clear. A sale is a conveyance of property that includes the transfer of title to that property, thereby divesting the seller of all property rights in the property. A conditional sale is a conveyance of property where another party retains some property rights in that property, including title, based on either a stated condition or a situation in which another party's property rights are triggered by the occurrence of some condition.[122]

On the other hand, the distinction between a conditional sale and a license is not always clear.[123] Like holders of any property, patent owners and their licensees may license distinct rights to third parties without losing the remainder. A license is a conveyance of property that does not include transfer of title, thereby creating a relational interest between the licensor and licensee. As in a conditional sale, another party retains property

---

119. *Id.*

120. *Mallinckrodt, Inc. v. Medipart, Inc.*, 976 F.2d 700, 704-06 (Fed. Cir. 1992).

121. *B. Braun Med.*, 124 F.3d at 1426; *see Princo Corp. v. Int'l Trade Commn.*, 616 F.3d 1318, 1328 (Fed. Cir. 2010) (en banc) (This post-*Quanta* opinion showed that the Federal Circuit did not feel *Quanta* changed this approach of the *Mallinckrodt* doctrine). The patentee can always chose to convey less than full patent rights. *Motion Picture Patents Co. v. Universal Film Co.*, 243 U.S. 502, 519 (1917) (Holmes, J., dissenting) ("Non debet cui plus licet, quod minus est non licere" – representing the idea that one who is permitted to consent to the greater may chose to consent to less.)

122. *What Amounts to a Conditional Sale*, 17 A.L.R. 1421 (1922).

123. *See* Mark R. Patterson, *Contractual Expansion of the Scope of Patent Infringement Through Field-of-Use Licensing*, 49 Wm. & Mary L.R. 157, 204 (2007) ("Part of the problem here may stem from the Federal Circuit's failure to distinguish between contracts and licenses."). One distinction might be in the quantity and the sophistication of the parties because mass-marketed licenses to general consumers are often argued to be sales. Software is increasingly transferred with purported licenses, but federal case law has not clearly determined whether these types of transfers are licenses or true sales.

rights in the property possessed by the buyer. The transaction in *Mallinkcrodt* seemed to be considered by the Federal Circuit as both a conditional sale and license; the distinction was immaterial to the opinion.[124]The distinction between a sale and license is important because an unconditional sale triggers patent exhaustion whereas license conditions might preserve the patent owner's ability to enforce patent rights with respect to the sold item. The distinction between a conditional sale and license is not important to patent exhaustion. "The Federal Circuit explained that the 'exhaustion doctrine ... does not apply to an expressly conditional sale or license.'"[125] In addition, the Supreme Court has quite consistently refused to allow the form into which the parties chose to cast the transaction to govern. The test has been whether or not there has been such a disposition of the article that it may fairly be said that the patentee has received his reward for the use of the article.[126]

6. The Rarely Exhausted Patent Right: The Right to Make

Patent exhaustion is the principle that the authorized sale of a product embodying a patent claim exhausts certain patent rights with respect to that individual item in its ordinary useful life. A utility patent grants the owner for 20 years from the patent's filing date the right to exclude others from 1) making, 2) using, 3) selling, 4) offering to sell or 5) importing the patented invention.[127]

---

124. *Mallinckrodt*, 976 F.2d at 708, n. 7.

125. *Static Control Components, Inc. v. Lexmark Int'l, Inc.* , 615 F. Supp. 2d 575, 583 (E.D. Ky. 2009) (quoting *LG Electronics, Inc. v. Bizcom Electronics, Inc.,* 453 F.3d 1364, 1369-1370 (Fed. Cir. 2006) and *B. Braun Med., Inc. v. Abbott Labs.*, 124 F.3d 1419, 1426 (Fed. Cir. 1997); *see Monsanto Co. v. McFarling*, 302 F.3d 1291, 1299 (Fed. Cir. 2002) (where something less than *all* of the patent rights have been conveyed, the 'first sale' rule is inapplicable); *Jazz Photo Corp. v. ITC*, 264 F.3d 1094, 1105 (Fed. Cir. 2001) (the 'first sale' or 'patent exhaustion' doctrine only applies where the first sale was 'unrestricted'); *B. Braun Med., Inc.*, 124 F.3d at 1426 ('This exhaustion doctrine, however, does not apply to an expressly conditional sale or license.'); *Mallinckrodt, Inc.*, 976 F.2d at 706 ('*[U]nconditional* sale of a patented device exhausts the patentee's right to control the purchaser's use of the device.')"); *Pioneer Hi-Bred Int'l, Inc. v. Ottawa Plant Food, Inc.*, 283 F. Supp. 2d 1018, 1033 (N.D. Iowa 2003) (For a conditional sale, the patent exhaustion defense is "simply inapplicable as a matter of law. *See Anton/Bauer, Inc. v. PAG, Ltd.*, 329 F.3d 1343, 1349 (Fed. Cir. 2003) (the 'exhaustion' doctrine is based upon the proposition that there was an 'unrestricted' sale")).

126. *United States v. Masonite Corp.,* 316 U.S. 265, 278 (1942).

127. 35 U.S.C. § 287.

Generally, patent exhaustion can occur for only the last four of the patent rights, but not the "right to make."[128]

The right to make is not exhausted generally because selling an individual embodiment of an invention never allows any purchaser to make another embodiment.[129] However, the right to make can be exhausted under certain circumstances. The right to make is exhausted by sale of an unfinished or unpatented component that substantially embodies a patented invention and for which the only reasonable use is to practice the invention.[130] Following the sale of such a component, a purchaser can finish or "make" the patented invention using only the purchased items, because that sale has exhausted the patentee's right to exclude the purchaser's right to practice the patent.[131]

7. Jazz Photo Corp. v. International Trade Commission (Federal Circuit 2001)

The authorized and unconditional purchase of a patented item allows the purchaser the right to use the patented item during its ordinary lifetime and to recondition "articles worn by use, unless they in fact make a new article."[132] The purchaser may continue to use the purchased patented item until it is worn out or may repair it or improve upon it as they please "in the same manner as if dealing with property of any other kind."[133] However, the purchaser never acquires any right to construct

---

128. Notwithstanding the Supreme Court's unequivocal statement: "The longstanding doctrine of patent exhaustion provides that the initial authorized sale of a patented item terminates all patent rights to that item." *Quanta*, 553 U.S. 617, 625 (2008) (emphasis added). The sale must also be unrestricted and unconditional.

129. *Jazz Photo*, 264 F.3d at 1105; *Mallinckrodt*, 976 F.2d at 709; *see also Cotton-Tie Co. v. Simmons*, 106 U.S. 89, 93-94 (1882) (holding that although accused patent infringers might acquire the right to use a purchased product; however, because of the principle of implied license or patent exhaustion, they could not acquire the right to make a new infringing article without the patentee's consent).

130. Patent exhaustion applies to method claims substantially embodied in a product for which the reasonable intended use is to practice the patent. *Quanta*, 553 U.S. at 618-630.

131. For exhausted method claims, the purchaser can practice the patent using the purchased item. *Quanta*, 553 U.S. at 636-638.

132. *U.S. v. Aluminum Co. of Am.*, 148 F.2d 416, 425 (2d Cir. 1945) ("The [patent] monopolist cannot prevent those to whom he sells from reconditioning articles worn by use, unless they in fact make a new article."); *see Carborundum Co. v. Molten Metal Equip. Innovations*, 72 F.3d 872, 879-880 (Fed. Cir. 1995).

133. *Mitchell v. Hawley*, 83 U.S. 544, 548 (1873).

another patented item for any purpose.[134] This distinction is between 1) the permissible act of repairing a patented article in its lifetime and 2) making a new, patent-infringing article, termed prohibited reconstruction.[135] This distinction is based on the principle of exhaustion.[136]

The Federal Circuit clarified the boundary between permissible repair and impermissible reconstruction in *Jazz Photo*.[137] Fuji Photo Film Co. (Fuji) owned 15 patents related to their single-use disposable cameras. The patents covered multiple parts and mechanisms within the disposable camera. To develop the film in the disposable camera required destruction of a light-tight compartment. The accused infringers' allegedly infringing conduct was selling refurbished Fuji cameras that had already been used by a consumer. The accused infringers acquired used Fuji cameras, replaced the batteries, added new film, re-sealed the light-tight compartments, re-packaged cameras and sold them as if new.[138]

Fuji sued importers of refurbished versions of its disposable cameras in a section 337 action before the International Trade Commission.[139] The defendants raised the defense of patent exhaustion by characterizing the refurbishing as permissible repair, not impermissible reconstruction. The defendants argued that the single-use camera was inherently capable of being used for multiple rolls of film over an extended period of time, despite Fuji's desire for the product to be used only once.[140]

Patent law prohibits reconstruction of a patented product, including from the template of a purchased patented product, by considering that conduct as patent infringement for violating the exclusive right to make the invention granted by a patent.[141] The Federal Circuit held that the patent rights in the sold disposable cameras were exhausted, including design patents. The court held the defendants' conduct was neither permissible repair nor prohibited reconstruction but merely reuse of exhausted components. "In the patent infringement context, if the claimed

---

134. A purchaser's "second creation of the patented entity" calls "the monopoly, conferred by the patent grant, into play for a second time." *Aro Mfg. Co. v. Convertible Top Replacement Co.*, 365 U.S. 336, 346 (1961).

135. *Jazz Photo Corp. v. ITC*, 264 F.3d 1094, 1102 (Fed. Cir. 2001).

136. *Id.* at 1105.

137. *Id.* at 1105-09.

138. *Id.* 1097-101.

139. *Id.*

140. *Id.* 1097-101.

141. *Id.* at 1102.

component is not replaced, but simply is reused, this component is neither repaired nor reconstructed."[142]

The Federal Circuit held that with an unrestricted and authorized sale, the purchaser always has the right to use and repair the item due to patent exhaustion.[143] However, a purchaser never has an implied right to make or manufacture the patented item again using any components–that is patent infringement and patent exhaustion does not apply. The sold product "may not be the vehicle for a 'second creation of the patented entity'" because "such re-creation exceeds the rights that accompanied the initial sale."[144] In other words, the sale of any patented product does not exhaust the patent right to make another version of the same patented item.

The court noted that the right to use and repair granted by implied contract with an authorized sale could be expressly restricted by contract, such as by using a "single use" restriction.[145] "The purchaser of a patented article has the rights of any owner of personal property, including the right to use it, repair it, modify it, discard it, or resell it, subject only to overriding conditions of the sale."[146]

8. The Supreme Court's *Quanta* Opinion

LG Electronics (LGE) owned numerous patents related to microchip memory components.[147] LGE licensed to Intel a patent portfolio to make and sell memory components. LGE's patent portfolio included the three patents-in-suit, which claimed 1) a method for organizing read/write requests in computer cache and random access memory (RAM); 2) a method for prioritizing access to a computer bus by computer components; and 3) a system for ensuring that the most current data are retrieved from RAM by monitoring data requests and updating RAM from the cache when stale data are requested.[148]

Intel was involved in a fragmented manufacturing market that involved the sale of both assembled components and individual components to be assembled by the purchaser or

142. *Id.* at 1107.
143. *Id.* at 1102.
144. *Id.* at 1105.
145. *Id.* at 1107.
146. *Id.* at 1102.
147. *Quanta*, 553 U.S. 617, 621-23 (2008).
148. U.S. Patent Nos. 5,379,379 (filed Sept. 6, 1990); 5,077,733 (filed Sept. 11, 1989); and 4,939,641 (filed June 30, 1988).

downstream purchasers. Under the terms of the license agreement, the "usual rules" of patent exhaustion were specifically purported to be unaltered.[149] However, Intel and LGE had agreed to a separate Master Agreement that required Intel to inform third party purchasers in writing that purchases of patented memory components were under a license that "does not extend, expressly or by implication, to any product that you make by combining an Intel product with a non-Intel product."[150] Thus, the Master Agreement purported not to license to the purchaser method patent rights, such as to perform the claimed methods or practice the claimed systems, and thus the purchaser was not authorized to combine Intel components with non-Intel components. Notwithstanding the Master Agreement, the Licensing Agreement said nothing about post-sale restrictions or giving notice to purchasers of such restrictions.[151]

Intel sold individual microchip components and chipsets to Quanta Computer (Quanta) and fulfilled its duty under the Master Agreement by notifying Quanta in writing about the non-Intel component license limitation.[152] Quanta ignored the notice and assembled Intel components with non-Intel components in ways covered by the LGE method patents-in-suit. LGE sued Quanta for patent infringement, and Quanta raised the affirmative defense of patent exhaustion.[153]

The judiciary was faced with the question of whether patent exhaustion was applicable to process patent claims. Eventually, the Supreme Court held for the first time that patent rights in process patent claims could be exhausted, while arguing that this was already an established precedent.[154]

The Supreme Court applied the substantial embodiment test from *Univis* and found that LGE's method patents were exhausted.[155] The Court reasoned that patent exhaustion is

149. *Quanta*, 553 U.S. at 623.

150. *Id.* at 623-24.

151. *Id.* at 636.

152. *Id.* at 624.

153. *Id.*

154. *Id.* at 618 (citing previous Supreme Court precedents that "rest on solid footing" such as *Ethyl Gasoline Corp. v. United States*, 309 U.S. 436, 446, 457 (1940), and *United States v. Univis Lens Co.,* 316 U.S. 241, *248-51 (1942)*). The exhaustion of a method patent claim was not involved in *Ethyl Gasoline* because the infringer would be the user of motor fuel and not the licensees, refiners or jobbers. *See* Dong, *supra* n. 6, at 20. Thus, *Quanta* was the first holding that patent rights in method patent claims were exhausted.

155. *Id.* at 631-34.

triggered by the authorized sale of products that embody essential features of a patented invention and whose only reasonable and intended use is to practice the patent. "It is true that a patented method may not be sold in the same way as an article or device, but methods nonetheless may be 'embodied' in a product, the sale of which exhausts patent rights."[156] The Court mentioned the precedent that "the sale of a motor fuel produced under one patent also exhausted the patent for a method of using the fuel in combustion motors" because the authorized sale of the fuel exhausted the patent monopoly.[157]

Under the essential features prong, the Court found the microprocessor and chipset components at issue substantially embodied the method claims of the patents-in-suit.[158] The Court analogized the microchip components in *Quanta* with the lens blanks in *Univis*. In both cases, although the products sold "did not fully practice the patents at issue," the patent rights were exhausted by the sale of the incomplete item when it embodied everything inventive about the patent because the only step necessary to practice the patent was the application of common processes or the addition of standard parts.[159] Under the reasonable and intended use prong, the Court found that the only apparent object of Intel's sale of memory components was to practice LGE's method patents-in-suit because the microprocessor and chipset components had no reasonable noninfringing use.[160] The Court held that by finishing off the invention, Quanta did not violate the patent right "to make" when only standard parts needed to be added.[161]

Finally, the Supreme Court addressed the issue of whether patent exhaustion could turn on the sale being conditional or qualified by a license. While LGE successfully argued to the

---

156. *Id.* at 628.

157. *Id.* at 629; *see Ethyl*, 309 U.S. at 625.

158. *Quanta*, 553 U.S. at 633-34.

159. *Id.* at 630, 638.

160. *Id.* at 633-34, 638 (The Court distinguished "capable of practicing the patent" from "infringing use," where the former was the proper standard and the latter was irrelevant to the analysis. The Court also refused to distinguish the products by removal versus addition. "There is no reason to distinguish the two cases on the ground that the articles in Univis required the *removal* of material to practice the patent while the Intel Products require the *addition* of components to practice the patent if the device practices patent A *while substantially embodying* patent B, its relationship to patent A does not prevent exhaustion of patent B.").

161. *Id.* at 633-35.

Federal Circuit in *Quanta* that there was no authorized sale because the License Agreement did not permit Intel to sell its products for use in combination with non-Intel products to practice the patents-in-suit, the Supreme Court noted that nothing in the License Agreement restricts Intel's right to sell products embodying the LGE Patents.[162] The Court did not say that patent exhaustion could never be contracted around, but in this case the applicable contract did not preclude a finding of patent exhaustion. The Court found that when LGE tried to define authorized sales in the Master Agreement, these terms were irrelevant because they were not in the license agreement, which granted an unrestricted right to sell to Intel.[163]

9. *Quanta* versus the *Mallinckrodt* Doctrine

While it is difficult to reconcile the reasoning in *Mallinckrodt* or *General Talking Pictures* with *Quanta*, *Quanta* did not overrule the holding in either case. *Quanta* merely holds that patent exhaustion occurs to products conveyed between a licensee and a purchaser regardless of restrictions in other agreements external to a license agreement granting authorization to sell without condition. If a patent owner directly licenses a patented product to a user, then this should prevent patent exhaustion. In addition, a licensee can try to characterize the transaction with the purchaser as a patent rights sublicense of the right to use instead of as a sale in order to prevent patent exhaustion. In both of these exceptions, the existence of patent exhaustion turns on the manner in which the transaction was made a license. If the licensee had the unrestricted right to sell the product but the definition of authorized sale was redefined by an external agreement and/or by a label-license, then the transaction was an unconditional sale and thus cannot legally be characterized as a license.[164]

Therefore, a better characterization of the *Quanta* holding is that it is independent of the *Mallinckrodt* doctrine: a patentee can use patent infringement to enforce post-sale restrictions that are

---

162. *Id.* at 636*; see Static Control Components, Inc. v. Lexmark Int'l, Inc.* , 615 F. Supp. 2d 575, 584 (E.D. Ky. 2009).

163. *Quanta*, 553 U.S. at 636.

164. Some read *Quanta* as overruling *Mallinckrodt* in that "policy considerations require that no conditions be imposed on patented goods after their sale and that Mallinckrodt's restriction could not 'convert[ ] what was in substance a sale into a license.'" *Static Control* , 615 F. Supp. 2d at 585.

within the scope of a patent.[165] The *Quanta* court did not address this issue. In other words, the majority of the *Mallinckrodt* doctrine survives unscathed because a conditional sale still prevents the occurrence of patent exhaustion.

Quanta might stand for the proposition that a patent owner can never use patent law to enforce post-sale restrictions on an authorized purchaser not in privity. Then these cases turn on whether a contract was formed between the purchaser and some other party authorized to convey patent rights at the time of sale. The *Mallinckrodt* doctrine holds that notice of a post-sale restriction is sufficient to create a conditional sale and thus prevent patent exhaustion, presumably because a valid contract was formed between the purchaser and a patent rights holder. *Quanta* holds that when a licensee who is authorized to convey the full right to use makes an authorized sale, then any external contractual restriction on the licensee is irrelevant. It is not clear whether patent exhaustion would still have occurred if the purchaser in *Quanta* had formed an unrelated contract with a restriction on use of any patented components.[166]

The *Quanta* Court never reached a decision on the viability of the *Mallinckrodt* doctrine, "instead reversing on a relatively narrow issue of contract interpretation."[167] *Quanta* held that LGE's licensee made an unconditional sale because the purchaser did not agree to any contractual limitations despite being on notice of the patent owner's contractual limitations on the licensee. As recently as 2010, the Federal Circuit has continued to endorse the *Mallinckrodt* doctrine, repeating the general rule that "express conditions accompanying the sale or license of a patented product, such as field-of-use limitations, are generally upheld."[168] The general holding of *Mallinckrodt* remains good law: a patent owner can use patent law to enforce post-sale restrictions on a

---

165. Erin Austin, Student Author, *Reconciling the Patent Exhaustion and Conditional Sale Doctrines in Light of Quanta Computer v. LG Electronics*, 30 Cardozo L. Rev. 2947, 2974-2975 (2009); Rinehart, *supra* n. 75, at 503; Saami Zain, *Quanta Leap or Much Ado About Nothing? An Analysis on the Effect of Quanta vs. LG Electronics*, 20 Alb. L.J. Sci. & Tech. 67, 101-106 (2010).

166. *Quanta* merely holds that patent exhaustion occurs to products conveyed between a licensee and a purchaser regardless of restrictions in other agreements external to a license agreement granting authorization to sell without condition.

167. Dufrense, *supra* n. 106, at 33; *see also* Rinehart, *supra* n. 75, at 503.

168. *Princo Corp. v. Int'l Trade Commn.*, 616 F.3d 1318, 1328 (Fed. Cir. 2010) (en banc).

patented product agreed to by the purchaser, so long as the restrictions do not violate law or equity.[169]

B. Applying the Principle of Patent Exhaustion to Patented, Self-Replicating Entities

In the 1990s, when the patenting of organisms became more widespread, the Federal Circuit created the *Mallinkrodt* doctrine and patent owners began using contracts in an effort to control the use of their patented organisms after sale.[170] Patentees in the patented seed industry rely on licensing agreements to maintain control over their patented technologies, to get full consideration for their patented products and to provide for future investment into research and development of new technologies.[171] Some licenses, called seedwrap licenses, involve notice of a contractual agreement printed on a "bag tag" attached to the product that is accepted by the purchase of the seed bag.[172]

Generally, the terms of these licenses limit the farmer's right to use the patented technology embodied in the seeds. For example, some licenses limit the use of purchased seeds to planting a commercial crop for only one growing season and prohibit the use of second-generation seeds, except as a commodity crop or for forage or feeding. These license terms strictly prohibit planting second-generation seeds, i.e. replanting or selling second-generation seeds for replanting.[173]

---

169. Dufresne, *supra* n. 106, at 36.

170. *Monsanto Co. v. Scruggs*, 459 F.3d 1328, 1328 (Fed. Cir. 2006); *Monsanto Co. v. McFarling*, 363 F.3d 1336, 1336 (Fed. Cir. 2004).

171. Tod M. Leaven, *The Misinterpretation of the Patent Exhaustion Doctrine and the Transgenic Seed Industry in Light of Quanta v. LG Electronics*, 10 N.C.J.L. & Tech. 119, 122-124 (2008). Savich, *supra* n. 7, at 115-116.

172. Mark D. Janis & Jay P. Kesan, *Intellectual Property Protection for Plant Innovation: Unresolved Issues After J.E.M. v. Pioneer*, 20 Nat. Biotech. 1161, 1163 (2002). The term "seedwrap" derives from "shrink-wrap" licenses, and later "click-wrap" licenses, that are widely used by the software industry for the conveyance of software to users, which may be more properly called a license and not a sale. The shrinkwrap and clickwrap methods of license formation can result in valid and enforceable contracts, but they remain controversial. Kenneth L. Port et al., *Licensing IP in the Information Age* 356 (2d Carolina Academic Press 2005).

173. Seed-saving restrictions for plants embodying patented technologies are targeted at predominantly autogamous plants like soybeans, wheat and cotton. Predominantly allogamous plants like maize do not produce infringing progeny when cross-pollinated by genetically different varieties and thus farmers

One of the first examples of post-sale restrictions on patented plants was Monsanto's licensing to other companies the right to make and sell patented Roundup Ready® soybeans.[174] Monsanto's licensees then sold patented seeds to farmers using either conditional sales or licensing arrangements.[175] Monsanto's licensees were contractually required to sell patented seeds only with Monsanto's seedwrap conditions on a bag tag and with the purchaser's execution of a licensing agreement, referred to as a "Technology Agreement."[176] These Technology Agreements restricted the use of the patented seeds 1) to "planting for commercial crop only in a single season;" 2) by prohibiting "replanting" of second-generation seeds or saving seeds to supply to another for "replanting;" and 3) by prohibiting the use of seeds for crop breeding, seed production, research or to provide to another for use in research.[177]

In a series of cases involving Monsanto, the Federal Circuit created new doctrines regarding the application of patent exhaustion to self-replicating, patented products. The Federal Circuit's new Inexhaustible Right to Exclude Reproduction doctrine holds that each generation of a patented plant infringes the right to make.[178] Thus, patented seeds conveyed into the stream of commerce are forever protected by patent rights such that using them to grow more than one generation is patent infringement.

1. Monsanto Co. v. McFarling (Federal Circuit)[179]

McFarling, a Mississippi farmer, purchased Roundup Ready® soybean seed from a licensee of Monsanto.[180] A typical bag of patented Roundup Ready® soybean seed was sold for

---

do not routinely save the resulting hybrid seed. Instead farmers plant homozygous seeds anew each growing season.

174. *Monsanto Co. v. McFarling*, 302 F.3d 1291, 1293 (Fed. Cir. 2002) (Monsanto licensed the sale of patented soybeans in 1997).

175. *Id.*

176. *Id.*

177. *Monsanto Co. v. Bowman*, 657 F.3d 1341, 1344-45 (Fed. Cir. 2011); *Monsanto Co. v. Scruggs*, 459 F.3d 1328, 1333 (Fed. Cir. 2006); *Monsanto Co. v. McFarling*, 363 F.3d 1336, 1339 (Fed. Cir. 2004). "Replanting" is the act of planting second-generation seeds to produce a second-generation plant.

178. *Bowman*, 657 F.3d at 1347-48.

179. *Monsanto v. McFarling*, 363 F.3d 1336 (Fed. Cir. 2004); *Monsanto v. McFarling*, 302 F.3d 1291, 1293 (Fed. Cir. 2002).

180. *McFarling*, 363 F.3d at 1338-40; *McFarling*, 302 F.3d at 1293-94.

about $19 to $22.[181] McFarling executed a Technology Agreement that required an additional licensee fee (Technology Fee) of $6.50 per bag to be paid to Monsanto and restricted the use of the seeds embodying patented technology. First, the patented seeds were only allowed to be planted for a commercial crop in a single growing season. Second, saving seed for the purpose of replanting was prohibited. Third, the selling of harvested, second-generation seed for the purpose of replanting was prohibited. McFarling saved 1,500 bushels of patented soybean seed and replanted them in 1999 in violation of the contract. From this next crop, he saved 3,075 bags of patented soybean seed and replanted them in 2000.[182]

Monsanto sued McFarling for patent infringement and breach of contract.[183] Monsanto owned patents claiming Roundup Ready® soybean plants, Roundup® tolerant plant cells and synthetic DNA molecules encoding Roundup® tolerance that confer the Roundup Ready® trait to plants.[184] McFarling raised the affirmative defenses of patent exhaustion, patent misuse and seed saving rights under the Plant Variety Protection Act.[185]

The District Court for the Eastern District of Missouri issued a preliminary injunction against McFarling.[186] McFarling's appeal of the injunction was affirmed by the Federal Circuit.[187] The Federal Circuit held McFarling did not establish a likelihood of success on the merits of any defense.[188] Later, the district court

---

181. *Monsanto Co. v. McFarling*, 488 F.3d 973, 979 (Fed. Cir. 2007).

182. *Id.*

183. *McFarling*, 302 F.3d at 1294.

184. U.S. Patent Nos. 5,633,435 (filed Sept. 14, 1994) and 5,352,605 (filed Oct. 28, 1993). The '435 patent contained many patent claims directed to self-replicating entities and implicated in the infringement action such as: 1) claim 24: "A glyphosate-tolerant plant cell comprising" the one of several DNA molecule encoding EPSPS enzymes; 2) claim 28: "A glyphosate-tolerant plant comprising plant cells" of claim 24 selected from various plants including soybean and cotton; 3) claim 79: "A seed of a glyphosate-tolerant plant" of claim 28; and 4) claim 86: "A transgenic soybean plant" containing a EPSPS enzyme.). The '605 patent contained patent claims direct to self-replicating entities such as: claims 4 and 17: "A plant cell which comprises a chimeric gene" based on Cauliflower Mosaic Virus promoter sequences.

185. *McFarling*, 363 F.3d at 1340; *McFarling*, 302 F.3d at 1294.

186. *McFarling*, 302 F.3d at 1298-99.

187. *Id.* at 1299-300.

188. *Id.* (In addition, the Federal Circuit affirmed that the Plant Variety Protection Act seed saving rights apply to plants protected by Plant Variety Protection certificates but not to plants protected by utility patents.). Judge Clevenger's dissenting opinion disagreed with the finding that the District Court of the Eastern District of Missouri had personal jurisdiction over McFarling

granted Monsanto's motion for summary judgment for patent infringement and breach of contract.[189] On appeal of the breach of contract holding, the Federal Circuit held that McFarling did not establish Monsanto committed patent misuse.[190]

In *McFarling*, the Federal Circuit held that patent exhaustion does not defend the creation of second-generation plants covered by the patent claims.[191] The court characterized the conveyance of the patented seeds as a license and not an unconditional sale.[192] The court reasoned that patent exhaustion is not implicated for the creation of a second-generation plant because it characterized this as the construction of new infringing copies, i.e. infringing the patentee's exclusive right to make.[193] Furthermore, the court found that when McFarling entered into the Technology Agreement, he paid a price that reflected only the value of the patent rights licensed.[194]

2. Monsanto Co. v. Scruggs (Federal Circuit 2006)

Scruggs was a collection of Mississippi farmers, farming companies and farm supply companies that were sued for patent infringement in a situation similar to that in *McFarling*, except they never signed any license agreement.[195] Scruggs purchased Roundup Ready® soybean seed and Bollgard®[196]/Roundup Ready® cotton seed from Monsanto licensees. Scruggs saved second-generation soybean and cotton seeds and then used the seeds to grow subsequent generations of crops. Monsanto sued

based on the forum selection clause in McFarling's patent license (the Technology Agreement). *Id.* at 1300-07.

189. *McFarling*, 363 F.3d at 1338.

190. *Id.* at 1341-43.

191. *McFarling*, 302 F.3d at 1298-99.

192. *McFarling*, 363 F.3d at 1339, 1342-43; *McFarling*, 302 F.3d at 1293.

193. *McFarling*, 302 F.3d at 1299.

194. *Id.*

195. *Scruggs*, 459 F.3d at 1332-33.

196. Bollworms are pests that can destroy cotton plants. Monsanto's Bollgard® plant traits are based on the McPherson patents; these patents are directed to molecular biological technologies to express foreign or indigenous genes in plant cells using various recombinant DNA constructs. U.S. Patent Nos. 5,164,316 (filed Aug. 17, 1989); 5,196,525 (filed Apr. 8, 1991); and 5,322,938 (filed Nov. 17, 1992). However, the McPherson patents do not enable the key technology of Bollgrad®, which is the conference of insect tolerance to plants via Cry transgene expression of *Bacillus thuringiensis* insecticidal crystal protein, i.e. Bt toxin.

Scruggs for patent infringement.[197] Scruggs raised the affirmative defenses of 1) patent exhaustion and 2) the existence of an implied license to use Monsanto's patented technology.[198]

The District Court for the Northern District of Mississippi granted a motion for summary judgment in favor of Monsanto and enjoined Scruggs from using seeds and plants embodying patented technology.[199] The district court reasoned that patent exhaustion was not applicable to a conditional sale.[200] In accord with the *Mallinckrodt* doctrine, the court found that the conditions were enforceable using patent law. The court found that Scruggs was on notice of the conditions and was bound by a conditional sale based on the Uniform Commercial Code.[201] The court held that the prohibition on replanting, which it called a single-use restriction, was within the patent grant because it related to the subject matter of a patent claim(s).[202] In addition, the court offered reasoning to support that the purpose of the restriction was more than merely securing annual royalty payments to Monsanto.[203] The district court found that Scruggs had no reasonable expectation to use Monsanto's patented technology without executing a license agreement.[204]

---

197. The patent claims alleged infringed by Scruggs included the Roundup Ready® patent '605 claiming Roundup® resistant plant cells (*see supra* n. 184) and the McPherson patents claiming Bt toxin expressing plant cells (*see supra* n. 196).

198. *Monsanto v. Scruggs*, 459 F.3d 1328, 1332-33 (Fed. Cir. 2006) (In addition, Scruggs raised the defense of lack of proper notice of the patents-in-suit.).

199. *Id.* at 1333-34.

200. *Monsanto Co. v. Scruggs*, 249 F. Supp. 2d 746, 751 (N.D. Miss. 2001).

201. *Id.* at 754.

202. *Id.* at 753.

203. *Id.* (For each growing season, the licensed commercial growers must pay a "Technology Fee" royalty. "Given the fact that the gene technology at issue is passed on to subsequent generations of seed, Monsanto's restriction to the production of a single commercial crop is logically intended to protect its patent monopoly and to thereby permit it to capture revenue in the form of future sales of technology. Without the prohibition against the saving of seed for replanting or resale, Monsanto's patent would soon be rendered useless by virtue of the potential for exponential multiplication of the seed containing its patented technology. Given the risk of Monsanto's thus losing control of its technology, the limited license of its technology was the only reasonable alternative available to it if it hoped to garner a reasonable return on its sizeable investment while making the technology available for commercial use at a reasonable price to consumers.").

204. *Monsanto v. Scruggs*, 459 F.3d 1328, 1334 (Fed. Cir. 2006).

Scruggs appealed the decision to the Federal Circuit.[205] The Federal Circuit affirmed the unavailability of the patent exhaustion and implied license defenses.[206] The court found that Scruggs was on notice of the conditional sale and license requirements and, thus, had no reasonable expectation of any right to use or make Monsanto's patented technology.[207] The Federal Circuit held that in addition to patent exhaustion being inapplicable to a conditional sale, patent exhaustion is not applicable to creating new seeds from purchased seeds because the new seeds had never been sold.[208]

The Federal Circuit expanded the holding beyond the considerations of authorization and conditional sales by taking into account the unique nature of self-replicating products. The court noted that the right to make a new seed cannot be exhausted even by an unrestricted and authorized sale because the act of growing of second-generation seeds and plants infringes the right to make the invention. By this reasoning, there is never patent exhaustion with respect to a second-generation plant without the authorized sale of the second-generation seeds. The court went on to note that to hold the opposite would eviscerate patent rights for all holders of patent rights in products with the capacity to replicate sold in the marketplace.[209]

In *McFarling*, the Federal Circuit relied on the *Mallinckrodt* doctrine in holding patent exhaustion inapplicable because McFarling was a licensee. In *Scruggs*, the Federal Circuit would have held patent exhaustion inapplicable regardless of the existence of an authorized and unconditional sale because of the unique nature of replicating technologies. In accordance with this reasoning of *Scruggs*, both McFarling and Scruggs would be liable for patent infringement for the replication of Monsanto's patented

---

205. *Id.* at 1335.

206. *Id.* at 1335-36, 1342.

207. *Id.*

208. *Id.* at 1336. Although The Federal Circuit held that patent exhaustion did not apply to replicating an entirely new infringing item, *Scruggs* has been read to involve an unauthorized sale that prevented patent exhaustion. The transfer of patented seeds to Scruggs by Monsanto's license was contractually defined as authorized only if the purchaser obtained a license from Monsanto. Thus, any sale by a licensee to an unlicensed grower like Scruggs was an unauthorized sale, which meant patent exhaustion was inapplicable. *See* Savich, *supra* n. 7, at 125-126 (The Federal Circuit held that "the doctrine of patent exhaustion was inapplicable because there was no unrestricted first sale.").

209. *Scruggs*, 459 F.3d at 1336.

technology, independent of any license, conditions or the *Mallinckrodt* doctrine.[210]

The Federal Circuit's reasoning is not based on *Mallinckrodt*; rather, it is based on the replicating nature of the patented technologies involved and the idea that patent exhaustion rarely applies to the right to make.[211] The fact that Scruggs failed to execute a license agreement making the sale unauthorized was irrelevant to the holding of patent infringement because the second generation seeds were never sold and, thus, patent exhaustion was inapplicable. The independence of the Federal Circuit's reasoning from the *Mallinckrodt* doctrine is shown more clearly by the next case.

3. Monsanto Co. v. Bowman (Supreme Court 2013)

Bowman was an Indiana farmer who bought Roundup Ready® soybean seed from a Monsanto licensee and executed a Technology Agreement.[212] Monsanto's license agreements authorized users to sell second-generation crop to dealers and grain elevators as a commodity and placed no restrictions on purchases made by grain elevators.[213] Grain elevators combine crops from multiple sellers and of different genetic backgrounds. Bowman purchased soybeans from a grain elevator. These seeds were considered "commodity seeds" by Monsanto's Technology Agreement and were not within the scope of the agreement. Some of the soybeans were resistant to Roundup®, presumably from being harvested and sold by licensed growers of Monsanto's patented soybeans.[214]

Bowman did some experimental planting with the seeds purchased from the grain elevator.[215] Bowman planted these soybeans as a second crop for the year 1999.[216] Bowman used Roundup®, and many soybean plants in this second-generation

---

210. *Monsanto Co. v. Bowman*, 657 F.3d 1341, 1347 (Fed. Cir. 2011).

211. *Id.* at 1335-36; *supra* pt. II (A)(5).

212. *Bowman*, 657 F.3d at 1345.

213. *Id.* at 1345-46 ("Based on Monsanto's statements, the only permissible reading of the Technology Agreement for purposes of this appeal is that it authorizes growers to sell seed to grain elevators as a commodity." Thus, the sales of patented seeds to grain elevators were probably authorized but conditional sales.); *Monsanto Co. v. Bowman*, 686 F. Supp. 2d 834, 836 (S.D. Ind. 2009).

214. *Bowman*, 657 F.3d at 1343-1346.

215. *Id.*

216. *Id.*

crop were resistant, presumably because the grain elevator contained a mixture of Monsanto's patented soybeans and unpatented soybeans from various farms. Bowman saved seed from this second crop and replanted seeds for the growing seasons from 2000 to 2007.[217]

Monsanto investigators discovered Bowman's activities,[218] and Monsanto sued Bowman for patent infringement for his "making" of their patented soybean seeds from 2000-2007.[219] Monsanto never contended that Bowman infringed any patent claims by breaching a license agreement, relying instead on *Scruggs*. Bowman raised the affirmative defense of patent exhaustion, where the authorized and unconditional sale of patented soybeans by the grain elevator to him exhausted the patent right to use, citing *Quanta*.[220]

First, Bowman argued that the grain elevator's sale of patented seeds was not contractually restricted by Monsanto and thus the sale was both authorized and unconditional.[221] Second, Bowman argued that under *Quanta*, each seed sold is a substantial embodiment of all progeny, implicating patent exhaustion in all successive generations.[222] In essence, Bowman argued for treating patent exhaustion of patented, self-replicating technologies like exhaustion of patented methods, where the patent right to make is exhausted by the sale of products embodying the ability to self-replicate.

---

217. *Bowman v. Monsanto Co.*, 133 S. Ct. 1766 (2013) (Bowman "purchased beans from a grain elevator anticipating that many would be Roundup Ready; applied a glyphosate-based herbicide in a way that culled any plants without the patented trait; and saved beans from the rest for the next season. He then planted those Roundup Ready beans at a chosen time; tended and treated them, including by exploiting their patented glyphosate resistance; and harvested many more seeds, which he either marketed or saved to begin the next cycle."); *Bowman*, 657 F.3d at 1343-46.

218. *Bowman*, 657 F.3d at 1343-46.

219. *Id.* (The patents-in-suit were the '605 patent and U.S. Reissued Patent RE39,247E, which was reissued in 2006 from the '435 patent. The '247E patent contains similar claims as in the '605 patent. *See supra* n. 184. In addition, the '247E patent contain claim 149 directed toward "a method for selectively controlling weeds in a field containing a crop having planted crop seeds or plants" by using the insertion of a synthetic EPSPS transgene into a plant and an efficacious dosage of glyphosate herbicide applied to the plant while growing in a field.).

220. *Id.* at 1346-47.

221. *Id.*

222. *Id.*

In response, Monsanto argued that contract terms of the Technology Agreement defined licensed growers' authorization to sell patented seeds to dealers and grain elevators by prohibiting specific uses of the patented seeds.[223] But regardless of any license arrangement, Monsanto asserted that patent infringement should attach whenever any user of patented seeds replicates another generation without Monsanto's consent. Monsanto argued that patent protection "is independently applicable to *each* generation of soybeans (or other crops) that contains the patented trait."[224]

In summary, the Federal Circuit held that patent exhaustion does not defend Bowman from patent infringement because "once a grower, like Bowman, plants the commodity seeds containing Monsanto's Roundup Ready® technology and the next generation of seed develops, the grower has created a newly infringing article."[225]

> "The fact that a patented technology can replicate itself does not give a purchaser the right to use replicated copies of the technology. Applying the first sale doctrine to subsequent generations of self-replicating technology would eviscerate the rights of the patent holder." *Scruggs,* 459 F.3d at 1336. The right to use "do[es] not include the right to construct an essentially new article on the template of the original, for the right to make the article remains with the patentee." *Jazz Photo Corp. v. Int'l Trade Comm'n,* 264 F.3d 1094, 1102 (Fed. Cir. 2001). The court disagrees with Bowman that a seed "substantially embodies" all later generation seeds, at least with respect to the commodity seeds, because nothing in the record indicates that the "only reasonable and intended use" of commodity seeds is for replanting them to create new seeds. *See Quanta,* 553 U.S. at 631. Indeed, there are various uses for commodity seeds, including use as feed. While farmers, like Bowman, may have the right to

---

223. *Id.*

224. *Id.* at 1347; s*ee Monsanto v. Scruggs*, 459 F.3d 1328, 1328 (Fed. Cir. 2006); *Monsanto v. McFarling*, 302 F.3d 1291, 1291 (Fed. Cir. 2002).

225. *Bowman*, 657 F.3d at 1348. This is contrary to some commentators reasoning in the wake of *Quanta*. *See, e.g.*, Rita S. Heimes, *Post-sale Restrictions on Patented Seeds: Which Law Governs?*, 10 Wake Forest Intell. Prop. L.J. 98, 131-140 (2010); Kevin Rodkey, *Exhaustion and Validity of Single-Use Licenses for Transgenic Seeds in the Wake of Quanta v. LG Electronics*, Fed. Cir. B.J. 579, 599-605 (2010); Leaven, *supra* n. 172, at 137-39.

> use commodity seeds as feed, or for any other conceivable use, they cannot "replicate" Monsanto's patented technology by planting it in the ground to create newly infringing genetic material, seeds, and plants.[226]

The Federal Circuit held the principle of patent exhaustion inapplicable and instead made a broad holding that any second-generation replication of a patented plant is patent infringement of the patentee's right to make regardless of the manner the first generation seed was conveyed.[227] Bowman argued to the contrary that progeny seeds that result from planting are "begotten" and not "made."[228] However, Bowman was clearly trying to exploit the glysophate-resistance technology patented by Monsanto to grow a new generation of soybeans without paying any royalty to Monsanto.[229]

A unanimous Supreme Court endorsed the Federal Circuit's inexhaustible right to exclude doctrine in the patented seed context.[230] The Court held that the exhaustion doctrine does not enable someone who buys patented seeds obtained under a

---

226. *Bowman*, 657 F.3d at 1348.

227. Monsanto used the Technology Agreement with farmers to limit what purposes farmers could sell seed to grain elevators, e.g. as a commodity but not for planting. Once seed was sold by grain elevator not in privity with a patent right holder, then all rights (except the rarely exhausted right to make) should be exhausted.

228. Petition for Writ of Certiorari, *Bowman v. Monsanto Co.*, 2011 WL 6468161, *9-20.

229. *Bowman v. Monsanto*, 133 S. Ct. 1761, 1765-66 (2013) (Bowman "took the soybeans he purchased home; planted them in his fields at the time he thought best; applied glyphosate to kill weeds (as well as any soy plants lacking the Roundup Ready trait); and finally harvested more (many more) beans than he started with. That is how 'to make a new product,' to use Bowman's words, when the original product is a seed. Brief for Petitioner 37; *see* Webster's Third New International Dictionary 1363 (1961) ('make' means 'cause to exist, occur, or appear,' or more specifically, 'plant and raise (a crop)'). "Bowman was not a passive observer of his soybeans' multiplication; or put another way,the seeds he purchased (miraculous though they might be in other respects) did not spontaneously create eight successive soybean crops . . . it was Bowman, and not the bean, who controlled the reproduction (unto the eighth generation) of Monsanto's patented invention."); Brief of CropLife America as Amici Curiae in Support of Respondent, *supra* n. 47, at 26; Brief of the United States as Amici Curiae in Supporting Affirmance at 26-28, *Bowman v. Monsanto Co.*, 133 S. Ct. 1761 (2013) (No. 11-796) ; Brief of Wisconsin Alumni Research Found. et al. as Amici Curiae in Support of Respondent at 27-30, *Bowman v. Monsanto Co.*, 133 S. Ct. 1761 (2013) (No. 11-796).

230. *Bowman*, 133 S. Ct. at 1763-66.

patent license agreement to reproduce the patented seeds through planting and harvesting without the patent holder's permission (either express or implied).[231] "Because Bowman thus reproduced Monsanto's patented invention, the exhaustion doctrine does not protect him."[232] The Supreme Court's new doctrine protects patented, self-replicating products while creating a risk of patent infringement for downstream users regardless of notice of any patent rights in the self-replicating product.

IV. PATENT MISUSE AND THE INEXHAUSTIBLE RIGHT TO EXCLUDE REPRODUCTION DOCTRINE

Patent misuse requires an expansion of the patent beyond its scope.[233] The exhaustion of patent rights could lead to a finding of a patent misuse after a patentee tried to improperly extend a patent by restricting rights that no longer exist because of exhaustion. The mere act of attempting to contract around patent exhaustion might constitute patent misuse.[234] Thus, a holding of patent misuse might depend on the threshold finding of patent exhaustion. If a patent right is exhausted, then a post-sale restriction based on the exhausted patent right is not only unenforceable under patent law but might represent patent misuse.[235] Thus, the occurrence of patent exhaustion is not only a defense to patent infringement but is also sometimes a prerequisite for conduct to be considered patent misuse.

A. The Doctrine of Patent Misuse

The doctrine of patent misuse, related to the equitable doctrine of unclean hands, is a way of limiting the abuse of patent

---

231. *Id.* at 1764-65.

232. *Id.* at 1765..

233. *See Broadcom Corp. v. Qualcomm Inc.*, No. 08cv1829, 2009 WL 684835, *2-*3 (S.D. Cal. Mar. 12, 2009) (In a declaratory judgment action, Broadcom alleged Qualcomm committed patent misuse by asserting exhausted patent rights based on patent license; however, the district court dismissed the complaint for failing to identify the specific patent exhausted.); Oliver, *supra* n. 6, at 63; Dong, *supra* n. 6, at 51, 73.

234. Judge Posner's reading of *Bauer* suggested that patent misuse could be based on an exhausted patent right, at least in the context of a restriction on an exhausted right to sell that resulted in price fixing. *USM Corp. v. SPS Tech., Inc.*, 694 F.2d 505, 510-12 (7th Cir. 1982).

235. A finding of patent misuse would also require the defending party to establish an anticompetitive effect that the patentee cannot justify by a showing of a procompetitive effect(s).

rights separate from antitrust law.[236] Patent misuse renders patent rights unenforceable in the case of the patentee's inequitable conduct in the enforcement or procurement of a patent claim.[237] A finding of patent misuse requires that "the patentee has impermissibly broadened the 'physical or temporal scope' of the patent grant with anticompetitive effect."[238] The difference between patent exhaustion and patent misuse is the difference between law and equity. Patent exhaustion refers to when there exists no legal right to enforce, whereas patent misuse refers to when the legal right to enforce exists but is unavailable for reasons of equity.

The doctrine of patent misuse was first articulated clearly during the 1940s in a series of three cases: *Ethyl Gasoline*, *Morton Salt* and *Mercoid*.[239] The Supreme Court reasoned that although a patent owner may grant licenses to make, use or sell a patented product, "restricted in point of space or time, or with any other restriction upon the exercise of the granted privilege," a patent owner may not enlarge their monopoly by attaching a condition to their license in an effort to "thus acquire some other [right] which the statute and the patent together did not give."[240]

Thus, just as patent exhaustion results in the extinguishment of a legal right because it falls outside the patent monopoly, patent misuse renders a patent unenforceable for conduct attempting to enlarge the patent monopoly. The question is whether conduct is permissible (for being within the patent monopoly) or impermissible (for attempting to expand the patent monopoly) based on the underlying public policy goals of patent law. Aside from fraudulent procurement of a patent, most patent misuse litigation involves the terms of contracts formed between patent owners and others. In addition, patent misuse

---

236. *B. Braun Med., Inc. v. Abbott Labs.*, 124 F.3d 1419, 1426 (Fed. Cir. 1997). Unlike a true unclean hands doctrine, patent misuse bars both equitable and legal remedies and allows for pre-misuse remedies.

237. *See C. R. Bard, Inc. v. M3 Sys.*, 157 F.3d 1340, 1365-66 (Fed. Cir. 1998); *Virginia Panel Corp. v. MAC Panel Co.*, 133 F.3d 860, 868-71 (Fed. Cir. 1997).

238. *Princo Corp. v. Int'l Trade Commn.*, 616 F.3d 1318, 1328 (Fed. Cir. 2010) (en banc); *Windsurfing Int'l v. AMF, Inc.*, 782 F.2d 995, 995 (Fed. Cir. 1986) (quoting *Blonder-Tongue Labs., Inc. v. University of Illinois Found.,* 402 U.S. 313, 343 (1971).

239. *Mercoid Corp. v. Mid-Continent Inv. Co.*, 320 U.S. 661 (1944); *Morton Salt v. G. S. Suppiger Co.*, 314 U.S. 488 (1942); *Ethyl Gasoline Corp. v. United States*, 309 U.S. 436 (1940).

240. *Id.* at 456.

jurisprudence often includes inquiries into anticompetitive effects, and thus, patent misuse analyses often resemble antitrust law inquiries. However, unlike the sword of claiming an antitrust violation, patent misuse is only available as a shield against patent infringement.[241]

Congress has created five statutory exceptions to patent misuse.[242] The most recent exception was created because "Congress was concerned about the open-ended scope of the [patent misuse] doctrine and sought to confine it to anticompetitive conduct by patentees who leverage their patents to obtain economic advantages outside the legitimate scope of the patent grant."[243] Patent misuse analysis can now be divided into three regimes: 1) conduct considered *per se* misuse, 2) conduct considered statutorily not misuse, and the middle ground, 3) conduct considered misuse based on a rule of reason analysis.

Conduct considered *per se* patent misuse include the fraudulent procurement of a patent claim[244] and contractual arrangements that abuse patent rights, such as patent right assignments or licenses with 1) agreements that extend patent rights after a patent expires—e.g. attempts to collect post-expiration royalties—[245] and 2) agreements that maintain resale prices of patented inventions in concert with others—i.e. a price-fixing conspiracy.[246]

Conduct considered patent misuse under the rule of reason must 1) attempt to improperly expand the scope or term of a

---

241. *Bio-Rad Labs., Inc. v. Nicolet Instrument Corp.,* 739 F.2d 604, 617 (Fed. Cir. 1984).

242. 35 U.S.C. § 271.

243. *Princo*, 616 F.3d at 1331. In 1984, the Supreme Court held that "if the Government has granted the seller a patent or similar monopoly over a product, it is fair to presume that the inability to buy the product elsewhere gives the seller market power." *Jefferson Parish Hospital Dist. No. 2 v. Hyde,* 466 U.S. 2, 16 (1984). "In 1988, Congress substantially undermined that foundation, amending the Patent Act to eliminate the market power presumption in patent misuse cases." *Illinois Tool Works Inc. v. Independent Ink, Inc.*, 547 U.S. 28, 31 (2006).

244. *C. R. Bard, Inc. v. M3 Sys.*157 F.3d 1340, 1364-65 (Fed. Cir. 1998).

245. *Brulotte v. Thys Co.*, 379 U.S. 29, 32-33 (1964); *see Virginia Panel Corp. v. MAC Panel Co.*, 133 F.3d 860, 868-69 (Fed. Cir. 1997).

246. *B. Braun Med., Inc. v. Abbott Labs.*, 124 F.3d 1419, 1426 (Fed. Cir. 1997); *Mallinckrodt, Inc. v. Medipart, Inc.*, 976 F.2d 700, 706 (Fed. Cir. 1992); *see, e.g.*, *United States v. New Wrinkle, Inc.*, 342 U.S. 371 (1952); *Newbourgh Moire Co. v. Superior Moire Co.*, 237 F.2d 283 (3d Cir. 1956).

patent claim and 2) result in an anticompetitive effect.[247] To improperly expand the scope or term of a patent has been described as imposing overbroad conditions on the use of a patent in order to leverage a patent "to obtain economic advantages outside the legitimate scope of the patent grant."[248] An anticompetitive effect tends "to restrain competition unlawfully in an appropriately defined relevant market."[249]

Examples of conduct held to be patent misuse under the rule of reason include licensing agreements that 1) use coercive package licensing of two or more patents;[250] 2) use tying arrangements of patented products to unpatented, separable products;[251] 3) use tying arrangements with compulsory total sales royalties;[252] and 4) limit the licensee's dealing with, developing or motivation to develop competing technologies, e.g. agreements not to buy or make competing products ("tie-outs") and grantback provisions that disincentivize competitive innovation.[253]

Patent misuse has been characterized by the Federal Circuit as "the patentee's act of impermissibly broadening the physical or temporal scope of the patent grant with anticompetitive effect."[254] When contractual conditions violate public policy in this way, the patents become unenforceable.[255] "The doctrine of patent misuse is thus grounded in the policy-based desire to 'prevent a patentee from using the patent to obtain market benefit beyond that which inheres in the statutory patent right.'"[256] "What patent misuse is about, in short, is 'patent leverage,' i.e., the use of the patent power to impose overbroad conditions on the use of the patent in suit that

---

247. *Virginia Panel*, 133 F.3d at 869-71; *Windsurfing Int'l v. AMF, Inc.*, 782 F.2d 995, 1001-02 (Fed. Cir. 1986).

248. *Princo*, 616 F.3d at 1331.

249. *Windsurfing Int'l*, 782 F.2d at 1002.

250. *Carbice Corp. of Am. v. Am. Patents Dev. Corp.*, 283 U.S. 27 (1931).

251. *United States v. Studiengesellschaft Kohle, m.b.H.*, 670 F.2d 1122, 1128 (D.C.C. 1981); *Robintech, Inc. v. Chemidus Wavin, Ltd.*, 628 F.2d 142 (D.C.C. 1980); *Amgen, Inc. v. Chugai Pharm. Co.*, 808 F. Supp. 894, 904 (D. Mass. 1992).

252. *Windsurfing Int'l*, 782 F.2d at 995; s*ee Zenith Radio Corp. v. Hazeltine Research, Inc.*, 395 U.S. 100, 137 (1969); *Glen Mfg. Inc. v. Perfect Fit Indus., Inc.*, 420 F.2d 319 (2d Cir. 1970); *Lightwave Techs., Inc. v. Corning Glass Works*, 19 U.S.P.Q.2d 1838, 1840 (S.D.N.Y. 1991).

253. *Princo*, 616 F.3d at 1328; *Virginia Panel Corp. v. MAC Panel Co.*, 133 F.3d 860 (Fed. Cir. 1997).

254. *Princo*, 616 F.3d at 1328 (citing *Windsurfing Int'l*, 782 F.2d at 1001).

255. *Id.*

256. *Id.* (citing *Mallinckrodt, Inc. v. Medipart, Inc.*, 976 F.2d 700, 704 (Fed. Cir. 1992)).

are 'not within the reach of the monopoly granted by the Government.'"[257] Overly broad conditions are conditions that effectuate the leveraging of a patent "to obtain economic advantages outside the legitimate scope of the patent grant."[258]

Like many equitable doctrines, patent misuse is amorphous.[259] Over time, as the number of decisions applying the doctrine of patent misuse increased, the contours of what constitutes patent misuse began to take shape.[260] Since 1986, the Federal Circuit has minimized the doctrine of patent misuse by confining the analysis almost exclusively to conduct constituting violations of antitrust law.[261] The main inquiry for patent misuse is "whether, by imposing conditions that derive their force from the patent, the patentee has impermissibly broadened the scope of the patent grant with anticompetitive effect."[262]

The requirement of an expansion of the patent grant restricts patent misuse to conduct deemed outside the boundary of patent law. However, the dependence of the doctrine of patent misuse on a finding of an unjustified anticompetitive effect focuses the analysis on whether that expansive conduct harmed competition in the relevant market.[263] Both the expansion of the

---

257. *Id.* at 1331 (citing *Zenith*, 395 U.S. at 136-38).

258. *Id.* at 1330.

259. *See* Janice M. Mueller, Patent Law 442 (3d ed., Aspen Publishers 2009).

260. *USM Corp. v. SPS Tech., Inc.*, 694 F.2d 505, 510-14 (7th Cir. 1982) (Judge Posner held that price discrimination via licensing agreements is not patent misuse. "The doctrine of patent misuse has been described as an equitable concept designed to prevent a patent owner from using the patent in a manner contrary to public policy. *Morton Salt Co. v. G.S. Suppiger Co.,* 314 U.S. 488 (1942). This is too vague a formulation to be useful; taken seriously it would put all patent rights at hazard; and in application the doctrine has largely been confined to a handful of specific practices by which the patentee seemed to be trying to 'extend' his patent grant beyond its statutory limits.").

261. *Windsurfing Int'l v. AMF, Inc.*, 782 F.2d 995, 995 (Fed. Cir. 1986). Prior to this, precedent held that only an impermissible broadening of the patent grant was required for a finding of patent misuse.

262. *C.R. Bard, Inc. v. M3 Sys.*, 157 F.3d 1340, 1372 (Fed. Cir. 1998).

263. It has been argued that this narrow focus on anticompetition is flawed because the Federal Circuit ignored precedents and misinterpreted legislative history that indicated patent misuse covers more than antitrust violations. *See* Camille Barr, Student Author, *License to Collude: Patent Pools, the Patent Misuse Doctrine, and Princo*, 45 U.C. Davis L. Rev. 629, 647-51 (2011); Richard Li-dar Wang, *Deviated, Unsound, and Self-Retreating: A Critical Assessment of the Princo v. ITC En Banc Decision*, 16 Marq. Intell. Prop. L. Rev. 51, 69 (2012); Saami Zain, *Misuse of Misuse: Princo Corp. v. International Trade Commission and the Federal Circuit's Misguided Patent Misuse Jurisprudence*, 13 N.C.J.L. & Tech. 95, 142-43 (2011).

patent grant and an unjustified anticompetitive effect are required to establish patent misuse. Thus, conduct that has a net anticompetitive effect but is within the scope of the patentee's patent grant is not patent misuse;[264] similarly, conduct that broadens the scope of the patent claim but does not have a net anticompetitive effect is not patent misuse. The defense of patent misuse is not available "simply because a patentee engages in wrongful commercial conduct, even conduct that may have anticompetitive effects."[265]

For example, a horizontal agreement that induces an uninvolved third party not to license its separate, competing technology resulting in an anticompetitive effect is not patent misuse because the conduct by the patentee(s) does not expand or attempt to expand the scope of the patent grant.[266] On the other hand, a tying arrangement that expands the scope of the patent will not be considered patent misuse if the patentee can justify its anticompetitive effects by a showing of net procompetitive effects.[267]

B. When Is Contracting Around Patent Exhaustion Impermissible?

"Breach of an enforceable condition of sale or license may leave the breaching party open to a claim for patent infringement."[268] However, there is confusion as to whether conditions that prevent patent exhaustion are enforceable using

---

264. *Princo Corp. v. Int'l Trade Commn.*, 616 F.3d 1318, 1329 (Fed. Cir. 2010) (en banc) ("Recognizing the narrow scope of the doctrine, we have emphasized that the defense of patent misuse is not available to a presumptive infringer simply because a patentee engages in some kind of wrongful commercial conduct, even conduct that may have anticompetitive effects").

265. *Id.*; *C.R. Bard,* 157 F.3d at 1373.

266. *Princo*, 616 F.3d at 1331.

267. *See Jefferson Parish Hospital Dist. No. 2 v. Hyde,* 466 U.S. 2, 41 (1984) (O'Connor, J., concurring) ("[Tie-ins] may facilitate new entry into fields where established sellers have wedded their customers to them by ties of habit and custom. . . . They may permit clandestine price cutting in products which otherwise would have no price competition at all because of fear of retaliation from the few other producers dealing in the market. They may protect the reputation of the tying product if failure to use the tied product in conjunction with it may cause it to misfunction. . . . And, if the tied and tying products are functionally related, they may reduce costs through economies of joint production and distribution. . . . A tie-in should be condemned only when its anticompetitive impact outweighs its contribution to efficiency.").

268. *Kendall Co. v. Progressive Med. Tech., Inc.*, 85 F.3d 1570, 1576 (Fed. Cir. 1996).

patent infringement actions.[269] This often is referred to by distinguishing whether patent exhaustion is a default rule or an immutable rule.[270] Patent exhaustion is an immutable rule; when its preconditions are met it controls, and patent exhaustion is never a default rule because it is either applicable or inapplicable. Patent exhaustion occurs only when certain conditions are met, and these conditions often involve contracts.

1. Patent Exhaustion Can Be Prevented Using Contracts

Patent exhaustion turns on whether a sale was both authorized and unconditional. Thus, one way to avoid patent exhaustion is to use contracts to make conditional sales and/or to define what is an authorized sale. Is this contracting around patent exhaustion? Yes, in the sense that contracts are used to avoid patent exhaustion; this is "contracting around" patent exhaustion as a way of solving a problem. However, as a matter of law, patent exhaustion either occurs or does not occur. Thus, the triggering of patent exhaustion rests upon the conditionality of the conveyance, which in turn often depends on the validity and enforceability of contract terms. The definition of exhaustion includes conditionality and authorization, both of which can depend on contract terms, so the definition is tautological. If patent exhaustion is taken into account by contract, then exhaustion might not occur. The definition of patent exhaustion is not altered by contract, so there is no modification of a substantive principle. In other words, the principle of patent exhaustion cannot be contracted around; it is the occurrence of patent exhaustion that is prevented by contract. Thus, contracting to avoid patent exhaustion is not equivalent to circumventing substantive law. The substantive rule of patent exhaustion is not evaded but rather prevented from being applicable.

Patent exhaustion can be avoided by a patentee in four ways. First, the patentee can expressly license patent rights with the conveyance of a product to the purchaser, creating a licensor-licensee arrangement and expressly reserving property rights in the

---

269. Donald S. Chisum, *Chisum on Patents*, §16.03[2][a][iii] (2008) ("Supreme Court decisions give apparently conflicting signals on whether a patent owner may limit exhaustion and restrict resales by imposing conditions on its sales of product or on sales by its licensees."); Rinehart, *supra* n. 75, at 499-503.

270. *Brief of the United States as Amicus Curiae in Support of Petitioners*, *supra* n. 109, at 6; Rinehart, *supra* n. 75, at 486 n. 13; Vincent Chiappetta, *Patent Exhaustion: What's It Good For?*, 51 Santa Clara L. Rev. 1087, 1098-116 (2011).

product. Second, the patentee can license patent rights to its licensee with a limited right to sublicense the patent rights. This is similar to the first approach because it creates a licensor-licensee-sub-licensee arrangement in which the patentee chooses the scope of rights authorized to be sub-licensed by its licensee and requires purchasers to become sub-licensees.[271] Third, in an attempt to limit the scope of patent rights that become exhausted or to leave room for the patentee to negotiate a separate license with each purchaser, the patentee can try to impose *Mallinckrodt*-style, post-sale restrictions directly on purchasers by expressly stating the consideration paid to the patentee is not for full patent rights. Fourth, the patentee can try to use *General Talking Pictures*-style authorization restrictions on the right to sell imposed on licensees to indirectly restrict purchasers' right to use.[272] In principle, these four arrangements should be able to preserve patent rights embodied in tangible personal property conveyed between parties.

Although it is possible to use contracts to prevent patent exhaustion from occurring, this cannot be done without limits. According to *Mallinckrodt*, the power to "contract around" patent exhaustion is limited under patent law by the prohibitions against enforcing restrictions that exceed the scope of patent grant under the doctrine of patent misuse.[273] After the debate stimulated by *Quanta*, there is some uncertainty as to which *Mallinckrodt*-style or *General Talking Pictures*-style restrictions would be enforceable and/or might open the door to patent misuse for venturing beyond the patent grant.[274]

Examples of post-sale restrictions on the use of a patented product that might be outside the scope of the patent grant include

---

271. For example in the copyright context, eBooks are typically provided to consumers as content protected by copyright and conveyed under a license-to-use, which is revocable and does not allow reproduction. Thus, eBooks are not subject to the first sale doctrine. *See* Joseph Gratz, *Digital Book Distribution: The End of the First-Sale Doctrine?*, 3 No. 5 Landslide 8 (2011).

272. If you never grant right to sell then patent exhaustion might never occur. *See* Dong, *supra* n. 6, at 50. This has been argued as harmful because costs might be borne primarily by persons not party to a contract with the restriction. Chiappetta, *supra*, n. 266, at 1125-27.

273. *Mallinckrodt, Inc. v. Medipart, Inc.*, 976 F.2d 700, 703 (Fed. Cir. 1992).

274. Austin, *supra* n. 166, at 2968-78; Dong, *supra* n. 6, at 47-62; Dufrense, *supra* n. 106, at 39-44; Thomas G. Hungar, *Observations Regarding the Supreme Court's Decision in Quanta Computer Inc. v. LG Electronics, Inc.*, 49 IDEA 517, 527-541 (2009); Jason McCammon, *The Validity of Conditional Sales: Competing Views of Patent Exhaustion in* Quanta Computer, Inc. v. LG Electronics, Inc.*, 128 S. Ct. 2109 (2008)*, 32 Harv. J.L. & Pub. Pol'y 785, 790-796 (2009); Patterson, *supra* n. 124, at 167-71; Zain, *supra* n. 166, at 100-03.

prohibitions on repair or resale.[275] Professor Patterson explained that when the default right to repair a patented product is taken away by contract, the patentee is effectively redefining patent infringement in a way that expands the patent statute.[276] Professor Patterson argued that this type of contract provision should not be enforceable using patent law.[277]

2. More Restrictive Terms Can Be Enforced on Licensees than on Purchasers

The distinction between a conditional sale and license is significant with regard to what restrictions are within the patentee's power to enforce using patent law. Although there are limits to contracting around patent exhaustion, these limits change when considering licensees versus purchasers. Purchasers are protected by the principle of patent exhaustion whereas licensees are not.[278] Sales involve passage of title to property and thus are governed by the principle of patent exhaustion based in the policies of patent law, whereas licenses are agreements between private parties governed by contract law, which is largely unrestrained by patent law.

Professor Patterson argued that license terms restricting resale should not be enforceable using patent law because such terms impermissibly expand the patent grant to define infringement.[279] This reasoning only applies to sales of tangible property that convey unconditional title. A licensor can retain property rights in personal property in the possession of a licensee. A licensee stands in the shoes of the patentee and thus can be restricted as if they were the patentee.[280] A licensee can be restricted to almost any field-of-use, geographic boundary, or sales price. The patentee can withhold the entire right to sell patented entities that their licensee creates.[281]

---

275. Patterson, *supra* n. 124, at 191-204.

276. *Id.*; *see also* Brief of Automotive Aftermarket Indus. Assn. et al. as Amici Curiae in Support of Petitioner at 31, *Bowman v. Monsanto Co.*, 133 S. Ct. 1761 (2013) (No. 11-796) ("By sweeping post-sale conditions within the patent right, the Federal Circuit improperly broadens the patent owner's right to exclude and narrows the field of lawful competition.").

277. *Id.*

278. Patterson, *supra* n. 124, at 164-165.

279. *Id.* at 193-211.

280. *United States v. Gen. Elec. Co*, 272 U.S. 476, 490 (1926).

281. *Id.*; *see* Patterson, *supra* n. 124, at 164-165 (In the situation of a license, it is clear that a patent owner can control the terms of the licensed rights via restrictions, even withholding specific rights. The licensee is an agent of the

C. Applying the Doctrine of Patent Misuse to Patented, Self-Replicating Entities

In the context of patented, self-replicating technology like plants, Monsanto has been accused of patent misuse for contracting around patent exhaustion in order to increase prices and collect duplicate royalties.[282] However, to determine whether Monsanto committed patent misuse, as explained above, there must be a threshold finding of patent exhaustion. Based on the Federal Circuit's Inexhaustible Right to Reproduction doctrine, any licensing terms or post-sale restrictions that limit the use of second-generation seed fall within the scope of a patent grant claiming a self-replicating entity and so cannot constitute patent misuse for attempting to expand the patent grant.

1. Monsanto Co. v. McFarling (Federal Circuit 2002)

In *McFarling*, the Federal Circuit upheld the district court's grant of a preliminary injunction against McFarling for patent infringement of Monsanto's patents by replanting patented Roundup Ready® soybean seeds.[283] McFarling raised the affirmative defense of patent misuse and a counterclaim of antitrust violations. McFarling argued that Monsanto committed antitrust violations by imposing tying arrangements and contracting around patent exhaustion in a concerted action with others to fix prices and argued that these actions constituted patent misuse. However, the court held that McFarling did not establish a reasonable likelihood of success on any defense or antitrust counterclaim.[284]

---

patent owner and "in effect stand in the shoes of the patentee," and accordingly the Supreme Court "has allowed the patentee to restrict its licensees as if the patentee itself were exercising the exclusive patent rights, as long as the restrictions are normally and reasonably adapted to secure pecuniary reward for the patentee's monopoly.").

282. *Monsanto v. McFarling*, 363 F.3d 1336, 1341-43 (Fed. Cir. 2004); *Monsanto v. McFarling*, 302 F.3d 1291, 1299 (Fed. Cir. 2002).

283. *McFarling*, 302 F.3d at 1299-300.

284. *Id.* (The district court concluded that there was no antitrust violation. The district court held that the relevant market was soybean seed sold in the U.S. The court reasoned that McFarling had not established that Monsanto committed an antitrust violation because competitors' prices or sales of soybean seeds were not controlled by Monsanto nor had the terms of the Technology Agreements created any restraint on farmers from buying competitors' soybean seeds.)

The Technology Agreement executed by McFarling limited his right to use seeds embodying patented technology.[285] First, the patented seeds were only allowed to be planted for a single commercial crop. Second, saving seed for the purpose of replanting was prohibited. Third, using the seed for research purposes was prohibited. Fourth, the selling of harvested seed to another for the purpose of replanting or research was prohibited. The Technology Agreement assures Monsanto that farmers must purchase new Roundup Ready seed each harvesting season and charges a Technology Fee per unit of seed purchased.[286]

McFarling argued the Technology Agreement impermissibly contracted around patent exhaustion and amounted to an illegal restraint of trade.[287] McFarling argued that by contracting around patent exhaustion, Monsanto forced farmers to buy new seed each year even though farmers can produce their own Roundup Ready® soybeans from their purchased seed.[288] McFarling argued the Technology Agreement constituted patent misuse because contracting around patent exhaustion broadened the patent grant with the anticompetitive effect of preventing farmers from growing multiple generations from their purchased seeds, thereby making them dependent on Monsanto each growing season to continue using the patented technology, which required yearly Technology Fee payments.[289] McFarling argued the terms of the Technology Agreements constituted both patent misuse and antitrust violations by coercing farmers into agreeing to a tying arrangement where the tied product was "fresh," i.e. not yet purchased patented seed, and the tied product was the "original" purchased seed.[290]

The Federal Circuit held that this was not patent misuse because patent exhaustion was not applicable when the patented seeds were conveyed under a license.[291] The court cited *Mallinckrodt* for the proposition that conditional sales are allowed if the condition is within the scope of the patent and does not violate some other law or policy. This analysis was in the rule-of-reason regime, which requires the party raising the patent misuse defense to establish an impermissible broadening of the scope of

285. *McFarling*, 363 F.3d at 1339.
286. *Id.*; *see Monsanto Co. v. David*, 516 F.3d 1009, 1012 (Fed. Cir. 2008).
287. *McFarling*, 302 F.3d at 1297-1299.
288. *Id.*
289. *Id.* at 1297-300.
290. *Id.*
291. *Id.* at 1297-99.

the patent grant with an anticompetitive effect. The Federal Circuit held that this was not patent misuse because the conditions that restricted use were within the scope of the patent. The court noted that, if, in order for farmers to buy patented seeds in the present, farmers were required by Monsanto's agreement to buy patented seeds from Monsanto in the future, then that would be patent misuse.[292]

2. Monsanto Co. v. McFarling (Federal Circuit 2004)

During the appeal of the district court's holding of patent infringement and breach of contract, McFarling argued that Monsanto committed patent misuse by prohibiting replanting in the Technology Agreement, which resulted in an impermissible tying arrangement.[293] McFarling's argument was unique to a self-replicating patented product. McFarling argued that once he purchased the patented soybean seed with the right to grow a first generation, then the natural growth of successive generations would be outside the scope of the patent, i.e. not infringement.[294] Thus, McFarling argued that Monsanto's Technology Agreement abuses patent law by attempting to enforce a restriction outside the scope of the patent by using contract terms to redefine the scope of a patent. In essence, McFarling argued that the license terms redefined the scope of infringement a way contrary to and broader than the patent grant.

The argument Monsanto's Technology Agreement constitutes impermissible tying is based on the authorized infringing use (growing the first generation) being illegally tied to the purported non-infringing use (growing n+1 generations). This arrangement forces a farmer to pay two separate patent royalties each season: 1) the Technology Fee for the right to grow a new generation and 2) a "patented seed fee" built into the price of

---

292. *Id.*

293. *McFarling*, 363 F.3d at 1341. In addition, McFarling argued that the no replant policy prevents the formation of a secondary market, which would result in lower prices for patented seeds, and thus Monsanto was impermissibly inflating patented seed prices by contracting around patent exhaustion. *See* Savich, *supra* n. 7, at 128. McFarling offered a novel tying argument that the plant trait, e.g. glyphosate resistance conferred by patented DNA molecules, was tied to the patented seeds, such that farmers are forced to pay for the right to use a patented trait each year. McFarling argued that the trait conferring seeds, once purchased, should be free from any prohibition on replanting or experimental crossing.

294. *McFarling*, 363 F.3d at 1342.

buying new patented seeds.[295] This might be viewed as an attempt at patent royalty double-dipping, which the principle of patent exhaustion serves to prevent.[296] McFarling argued that the purchase of seed should only require paying Monsanto the "patented seed royalty" once and thereafter farmers should be allowed to continuously replant patented seeds so long as they pay the annual Technology Fee royalty.[297]

The Federal Circuit characterized this argument as, in effect, proposing a compulsory license for the right to use patented seeds for future planting.[298] The court held that the restrictions of the licensing agreements did not extend Monsanto's rights under the patent statute because unmodified soybeans were available in the market and Monsanto had the exclusive right to exclude anyone from using their patented technology to confer Roundup® resistance to a seed.[299] The court held that these conditions were within the scope of the patent because the claims read on both first-generation and future generations of seed regardless of the method of its creation.[300] Because the conduct was within the scope of the patent, the court did not analyze any possible anticompetitive effects of the licensing arrangement.

The Federal Circuit rejected McFarling's antitrust counterclaim because it was based on an alleged tying arrangement already found to be unsupported in its patent misuse analysis.[301] The court asserted that licensing and selling activity with the scope of the patent grant cannot support an antitrust violation. The court characterized McFarling's antitrust argument as based on Monsanto's refusal "to grant him a license to use the second-generation genetically modified seeds in his possession after harvest," which the court characterized as a permissible refusal to license use rights in future planting seasons.[302]

3. Monsanto Co. v. Scruggs (Federal Circuit 2006)

---

295. *Id.*

296. *See PSC Inc. v. Symbol Techs.*, 26 F. Supp. 2d 505, 510 (W.D.N.Y. 1998).

297. *McFarling*, 363 F.3d at 1342; *see Monsanto v. Scruggs*, 459 F.3d 1328, 1340 (Fed. Cir. 2006).

298. *McFarling*, 363 F.3d at 1341-44.

299. *Id.*

300. *Id.*

301. *Id.* at 1343-44.

302. *Id.*

When Monsanto sued Scruggs for patent infringement for saving second-generation soybean and cotton seeds to grow subsequent generations of infringing crops, Scruggs raised the affirmative defense of patent misuse and also accused Monsanto of antitrust violations.[303] Scruggs argued that Monsanto's licensing agreements included tying arrangements and field-of-use restrictions that used patent leverage to restrain trade.[304] For example, Monsanto was accused of tying different patented products together: 1) selling patented Roundup Ready® cotton only with patented Bollgard® resistance technology and 2) licensing use of Roundup Ready® seed only with Monsanto's patented glyphosate herbicide and not any competitor's glyphosate.[305] In addition, Monsanto was accused of imposing impermissible field-of-use limitations by prohibiting: 1) the replanting of patented seeds and 2) the use of seeds for research.[306]

The Federal Circuit held that Scruggs failed to establish that Monsanto committed illegal tying and held that field-of-use licensing restrictions were within the scope of the patent.[307] In order for conduct to amount to patent misuse, the patentee must impermissibly broaden the scope of the patent grant.[308] Thus, if the restriction is reasonably within the patent grant, then the patent misuse defense can never succeed. The Federal Circuit held that Scruggs did not point to any activity falling outside Monsanto's patents and thus Scruggs did not provide sufficient evidence to establish that Monsanto's behavior amounted to illegal tying, such as by the use of coercion.[309]

---

303. *Monsanto v. Scruggs*, 459 F.3d 1328, 1339 (Fed. Cir. 2006) (The Federal Circuit held that Scruggs failed to establish Monsanto committed an antitrust violation because the restrictions in Monsanto's Technology Agreements were found to be within the protection of the patent laws and there was no showing of an illegal tying arrangement.).

304. *Monsanto Co. v. Scruggs*, 342 F. Supp. 2d 568, 572-77 (N.D. Miss. 2004).

305. *Scruggs*, 459 F.3d at 1339 (The Federal Circuit found the tying arrangement of using patented Roundup Ready® seed to grow one generation of crops and to only use patented Roundup® did not to have an adverse effect on competition because Roundup® was the only Environmental Protection Agency approved glyphosate on the market at the time. Generic versions had been created but had not received government approval for sale on the market.).

306. *Id.*

307. *Id.* at 1340-41.

308. *Id.*

309. *Id.* at 1341.

> Monsanto has a right to exclude others from making, using or selling its patented plant technology, *see Brulotte,* 379 U.S. at 29-30, and its no replant policy simply prevents purchasers of the seeds from using the patented biotechnology when that biotechnology makes a copy of itself. . . Lastly, the no research policy is a field-of-use restriction and is also within the protection of the patent laws.[310]

In *McFarling*, patent exhaustion did not apply because McFarling was a licensee of Monsanto without the right to use the infringing seeds.[311] Although contrary to intuition, farmers in McFarling's situation can be considered "licensed manufacturers" of Monsanto's patented inventions. This type of licensing situation might allow Monsanto to exert more extreme contract terms than those currently being used in Monsanto's Technology Agreements. On the other hand, the Federal Circuit considered the situation in *Scruggs* to entail a conditional sale that should include stricter scrutiny of post-sale restrictions based on the policies underlying patent exhaustion.

D. The Inexhaustible Right to Exclude Reproduction Doctrine

There exists a tension between patent owners' legitimate desire to protect their rights embodied in patented, self-replicating products and the enforcement of the principle of patent exhaustion. Patentees want to prevent every purchaser from becoming a potential producer.[312] However, purchasers might need protection from patentees exceeding the bounds of their patent grants, such as by double-dipping and unreasonable restraints on personal property. The public should be served by a patent system that promotes innovation without allowing patentees to abuse their patent rights. The District Court of the Northern District of Mississippi explained the underlying problem in *Scruggs*

> Given the fact that the gene technology at issue is passed on to subsequent generations of seed, Monsanto's restriction to the production of a

310. *Id.* at 1340. The *Scruggs* court's analysis of Monsanto's field-of-use restrictions has been described as inadequate, leading to the conclusion that the Federal Circuit will allow almost any field-of-use restriction. Patterson, *supra* n. 124, at 183-185.

311. *Monsanto v. McFarling*, 302 F.3d 1291, 1299 (Fed. Cir. 2002).

312. Savich, *supra* n. 7, at 115.

> single commercial crop is logically intended to protect its patent monopoly and to thereby permit it to capture revenue in the form of future sales of technology. Without the prohibition against the saving of seed for replanting or resale, Monsanto's patent would soon be rendered useless by virtue of the potential for exponential multiplication of the seed containing its patented technology. Given the risk of Monsanto's thus losing control of its technology, the limited license of its technology was the only reasonable alternative available to it if it hoped to garner a reasonable return on its sizeable investment while making the technology available for commercial use at a reasonable price to consumers.[313]

Therefore, the legal system should both 1) prevent the evisceration of the patentee's right to collect its reward in patenting a self-replicating product and 2) fulfill the goals of patent exhaustion. The dilemma is how to preserve patent owners' right to collect a fair reward within the scope of their patents while instituting a principle of patent exhaustion that sets a reasonable boundary on the patent grant. In *Quanta*, the U.S. Solicitor General's amicus brief argued that the Supreme Court had never suggested that "the patent-exhaustion doctrine applies to the *products* of a patented item that is capable of reproducing itself in the hands of the purchaser — e.g. newly-grown seeds that are identical to, and grown from, a patented genetically modified seed that was purchased from the patentee or an authorized licensee."[314] In this vacuum of guidance from the Supreme Court, the Federal Circuit has created a new doctrine in *Bowman* and *Scruggs*. This inexhaustible right to exclude reproduction doctrine defines the patent right to make to include by default the creation of progeny of patented organisms without the patentee's consent and defines the enforcement of post-sale restrictions on reproduction as within the scope of patent law so that it is not patent misuse. Although this doctrine was formulated for seeds and plants, this new doctrine suggests a general rule where the patentee's right to make is inexhaustible for any patented self-replicating entity, such as

313. *Monsanto Co. v. Scruggs*, 249 F. Supp. 2d 746, 753 (N.D. Miss. 2001).

314. *Brief of the United States as Amicus Curiae in Support of Petitioners*, *supra* n. 109, at 16, n. 6.

organisms, viruses, prions, ribozymes, transposons and nanoscale machines.

V. THE DOCTRINE OF THE INEXHAUSTIBLE RIGHT TO EXCLUDE REPRODUCTION PROMOTES INNOVATION WITH LITTLE PRESENT DAY PRACTICAL HARM TO THE PUBLIC

Patent law must set a balance that allows for patent owners' rights to collect a fair reward within the scope of their patents while instituting doctrines of patent exhaustion and patent misuse that set the boundaries of the patent grant to protect purchasers and downstream users. The Federal Circuit's current inexhaustible right to exclude reproduction doctrine defines the patent right to use as not including the right to make progeny without the patentee's consent, regardless of any contract arrangement or patent rights license. Does the inexhaustible right to exclude reproduction doctrine mesh with the goals of patent exhaustion and patent misuse?

A. How Should Patent Exhaustion Be Applied to Self-Replicating Technologies?

Autonomously self-replicating technologies pose unique problems for the principle of patent exhaustion. In addition, some instances of patent misuse might be based on a patentee's effort to enforce an exhausted patent right.[315] Because it is unclear how patent exhaustion should apply to self-replicating products, it also is unclear how the doctrine of patent misuse should apply to the use of contracts intended to prevent the exhaustion of patent rights in self-replicating products.[316] The Supreme Court's new inexhaustible right to exclude reproduction doctrine correctly holds that the replication or reproduction of a new, self-replicating inventive entity should fall within the general scope of the patent grant for all patentees. However, does this doctrine create restrictions on trade based on patent law that move forever with personal property and allow patentees to tax downstream users in a way that over-rewards patentees or is unreasonably anticompetitive?

1. The Unauthorized Creation of a New Inventive Entity Should Be Patent Infringement

315. *See supra* n. 230.

316. *See McFarling*, 302 F.3d at 1297-300.

Is the inexhaustible right to exclude reproduction doctrine correct, or should farmers like Bowman have the right to plant the seeds purchased from a grain elevator but not the right to replant second-generation seeds? The right to use is often exhausted; whereas, the right to make is rarely exhausted because this occurs upon the sale of unfinished patented product or unpatented component that substantially embodies a patented invention where its only reasonable use is to practice the invention.[317]

The Supreme Court's inexhaustible right to exclude reproduction doctrine correctly defines the reproduction of a new inventive entity as falling within the scope of the general patent grant.[318] However, the principle of patent exhaustion depends on the circumstances at the time of conveyance of tangible property embodying patent rights. Perhaps the authorized sale of seeds not covered by any contract either 1) exhausted the patentee's right to exclude the planting and making of second-generation seeds or 2) conveyed an implied right to plant the seeds to generate second-generation seeds.

What if Monsanto had charged Bowman with patent infringement for making the first generation? First, neither Bowman nor the grain elevator was bound by any contract restriction with regard to the seeds that were purchased and sold. Second, Bowman could argue that when the grain elevator sold seeds to Bowman the reasonable and intended uses included both as a commodity and for planting. Thus, the reasonable and implied use of seeds for planting created an implied license.[319] Third, Bowman could argue that the authorized sale of the seeds exhausted the right to use the purchased seeds (but not the right to generate more seeds). The success of this argument would turn on whether the two prong test from *Univis* test could be satisfied.[320] The essential features prong probably could be met, but the reasonable and intended use prong probably could not be met.

Under the essential features prong, the inquiry would involve whether 1) the purchased soybean seeds substantially embodied all the patent claims-in-suit and 2) only common

---

317. *Supra* pt. II (A)(5).

318. *See* Michelle Ma, Student Author, *Anticipating and Reducing the Unfairness of Monsanto's Inadvertent Infringement Lawsuits: A Proposal to Import Copyright Law's Notice-and-Takedown Regime into the Seed Patent Context*, 100 Cal. L. Rev. 691, 711-13 (2012).

319. *But see Monsanto Co. v. Bowman*, 686 F. Supp. 2d 834, 839 (S.D. Ind. 2009) (The grain elevator "had no right to plant the soybeans and could not confer such a right on Bowman").

320. *See supra* pt. II (A)(1).

processes or standard parts were used to change the purchased item into the infringing item.[321] The purchased seeds substantially embodied all the patent claims potentially asserted against Bowman. For example, Monsanto might have asserted that Bowman infringed the right to make both a Roundup® tolerant plant cell and a synthetic DNA molecule encoding Roundup® tolerance. The purchased seed 1) contained patented DNA molecules, 2) contained patented plant cells, 3) was capable of creating patented plant cells containing patented DNA molecules and 4) was capable of growing into a plant exhibiting the Roundup® tolerance trait. It would not be unreasonable to conclude that the purchased seeds embody these patent claims. Under the reasonable and intended use prong, the inquiry would be whether the purchased soybean seeds had any reasonable noninfringing use and only noninventive processes were applied to them to create the allegedly infringing entities.[322] Bowman could have successfully argued that cultivating the soybeans with herbicide consisted entirely of authorized and non-inventive processes. However, Monsanto might successfully have counter-argued that the seeds could be used as a commodity, such as a consumable, which is a reasonable and non-infringing use.[323] Monsanto should have succeeded because the inquiry is "whether the product is 'capable of use only in practicing the patent,' not whether other potential uses are infringing."[324] Thus, if seeds reasonably could be used as a consumable commodity and for cultivating plants, then patent rights are not exhausted.[325]

Fourth, Monsanto probably could have charged Bowman with patent infringement of the right to make a patented DNA molecule or a patented plant cell for Bowman's conduct in cultivating the first generation in 1999. Technically Bowman committed patent infringement each time a plant cell divided as the seedling changed into a plant because this involved making patented plant cells and patented DNA molecules.[326] Again,

---

321. *Quanta Comp., Inc. v. LG Elec., Inc.*, 553 U.S. 617, 633-34 (2008).

322. *Id.* at 633-34, 638.

323. *Bowman v. Monsanto Co.*, 133 S. Ct. 1761, 1765-66 (2013) ("the commodity soybeans he purchased were intended not for planting, but for consumption"); *Monsanto Co. v. Bowman*, 657 F.3d 1341, 1347-48 (Fed. Cir. 2011); Brief of Am. Intell. Prop. Law Assn. as Amici Curiae in Support of Petitioner at 18, *Bowman v. Monsanto Co.*, 133 S. Ct. 1761, 1765-66 (2013).

324. *Quanta*, 553 U.S. at 631 (quoting *United States v. Univis Lens Co.,* 316 U.S. 241, *249 (1942)).*

325. *Bowman*, 657 F.3d at 1347-48.

326. *See Monsanto Co. v. David*, 516 F.3d 1009, 1092-94 (Fed. Cir. 2008).

Bowman could have argued the defense of patent exhaustion and the essential features prong probably could be met; however, the reasonable and intended use prong would fail because the purchased seeds have a reasonable and non-infringing use as a commodity.[327]

2. The Fine Line between the Right to Use and the Right to Make When Selling Seeds

In general, there is a clear difference between using something and making something. However, the licensing of patented seeds for growing blurs this difference. Monsanto licenses to farmers the right to use a patented seed to plant and grow an adult plant for only a single growing season. However, the right to make is intertwined with the right to use.[328] First, if a seed is bought with a right to use that only includes one generation of reproduction, then how should this affect patent exhaustion or implied license defenses to charges of infringement of the right to make?

Monsanto sells P_0 seeds and intends to let the farmer grow P_0 plants that generate F_1 seeds. Monsanto prohibits the farmer from growing F_1 plants or F_2 seeds.[329] However, the right to grow the P_0 plant that generates F_1 seeds by definition was the creation of a second-generation, albeit at its earliest developmental stage. This authorized use results in the "making" of a second generation of patented F_1 seeds when the first-generation P_0 plant flowers.[330] Thus, Monsanto is actually granting farmers both 1) a limited right to use and 2) a limited right to "make" its patented entities.

---

327. *Supra* n. 324.

328. Jeremy N. Sheff, *Self-Replicating Technologies*, 16 Stan. Tech. L. Rev. 229, 238-40 (2013).

329. This is common genetic nomenclature where P_0 is equivalent to first-generation; F_1 is the second generation and F_2 is the third generation. It may be conceptually advantageous to some use this scientific nomenclature.

330. In the patent license situation, farmers act as licensed "manufacturers" of patented products when they plant patented seeds and grow flowering plants to produce more seeds; however, some may disagree with the characterization of reproducing an organism as "making." One definition of "make" is "to cause to exist," which should require human intervention, in this case planting the seed. A commercial farmer would rarely accident or unintentionally plant seeds. Thus, the conduct of planting a seed that results in the reproduction of a patented organism may properly be characterized as infringing the right to make; whereas, the wind blowing a seed onto your land resulting in the reproduction of a patented organism would not infringe the right to make.

Furthermore, Monsanto owns patents claiming DNA molecules in the seeds and every cell in Roundup Ready® plants. When Monsanto licenses to farmers the right to use a patented seed to plant and grow an adult plant, then Monsanto is licensing the right to make and use patented DNA molecules for each cell division in the growing plant. However, Monsanto purports to restrict to a single planting via license agreements the right to make and use patented DNA molecules.

An unanswered question is how finely the right to use and the right to make an organism can be divided without exhausting either right in the process. Can patent rights in a patented organism be subdivided by field-of-use restrictions such that one can make a second-generation F_1 zygote but not a second-generation F_1 adult?

The answer to this question might need to differentiate the reproduction of an organism from the replication of a patented technology embodied in an organism and/or the specific uses of the organisms with relation to the patented phenotypic traits conferred by separately patented technology. Conduct that does not exploit the patented technology might be shielded from liability by the occurrence of patent exhaustion. For example, the using of Roundup Ready® plant tissue as a commodity is very different from cultivating it to out-compete other plants when exposed to glyphosate herbicides.

3. Does licensing rights with seeds to create a first-generation plant that flowers to make second-generation seeds exhaust the right to use second-generation seeds for planting?

In *McFarling*, the Federal Circuit's answer was no.[331] McFarling was authorized to use purchased seeds to create second-generation F_1 seeds. However, McFarling committed patent infringement when he planted those authorized, second-generation F_1 seeds because this violated the terms of the Technology Agreement, a patent license. Thus, granting the right to make a patented seed does not result in exhausting the right to use that patent seed.

One could argue that authorization of the right to use the purchased P_0 seeds to 1) make P_0 plants, 2) make a F_1 seeds (crop) and 3) sell the F_1 seeds (crop) as a commodity exhausts the patent right to exclude use of those F_1 seeds. This argument asserts that

331. *Monsanto v. McFarling*, 302 F.3d 1291, 1298-99 (Fed. Cir. 2002).

the patentee's right to exclude the use of F_1 seed for replanting was exhausted. The argument is that by granting the right to make the F_1 crop, the patentee has exhausted the right to use the F_1 crop and thus the patentee has no control over the second-generation F_1 seed.[332]

However, the Federal Circuit has repeatedly rejected this argument because patent exhaustion does not apply when the second-generation seeds had never been the result of an authorized sale.[333] This argument also fails because the right to use is exhausted upon selling but not upon the licensed making. In general, a patentee is acting within their rights to license the right to manufacture a product but withhold the right to use or sell it.[334] The line between using and making is blurred for autonomously self-replicating entities because the act of self-replication is coincident with their use.

4. Does conveying a patented first-generation seed into the marketplace automatically exhaust all patent rights in second-generation seeds derived from the first-generation seed?

In *Scruggs*, the defendants purchased patented seeds in a conditional sale and committed patent infringement when they replanted second-generation seeds.[335] Unlike McFarling, Scruggs was not in privity with Monsanto. Scruggs infringed the right to make a second-generation plant because this right cannot be exhausted without the sale of the seed of the same generation as the allegedly infringing plant or a generation earlier as the allegedly infringing seeds.[336] In *Bowman*, Bowman purchased patented seeds from an unlicensed seller not in privity with Monsanto.[337] Like Scruggs, Bowman infringed the right to make a second-generation F_1 plant. The Federal Circuit held that, for self-replicating technologies, the creation of new versions (progeny) is patent infringement of the right to make regardless of any authorized sale of the parental or the grant of the right to use with

---

332. *Id.* at 1298.

333. *Monsanto Co. v. Bowman*, 657 F.3d 1341, 1347-48 (Fed. Cir. 2011); *Monsanto v. Scruggs*, 459 F.3d 1328, 1336 (Fed. Cir. 2006).

334. *See supra* n. 279.

335. *Scruggs*, 459 F.3d at 1336.

336. *Bowman*, 657 F.3d at 1347-48; *Scruggs*, 459 F.3d at 1336.

337. *Monsanto Co. v. Bowman*, 686 F. Supp. 2d 834, 835-36 (S.D. Ind. 2009).

the sale or license of the parental, either expressly or implicitly.[338] Both *Scruggs* and *Bowman* show that the right to make future generations of a patented plant is never exhausted without the sale of the same-generation seed, regardless of license terms, a lack of privity of contract or the presence of an authorized sale.[339]

5. Can Farmers Be Restricted from Replanting F_1 Seeds They Were Authorized to Make?

In *Scruggs* and *Bowman*, the Federal Circuit and the Supreme Court held the right to make future generations of a patented plant is inexhaustible without the sale of the same-generation seed.[340] Thus, Monsanto does not need to use contracts to prohibit the replanting second-generation seeds in order to avoid patent exhaustion. It is still valuable to ask whether Monsanto's post-sale restrictions were within the scope of the patent grant and, if not, whether Monsanto might have committed patent misuse. The first step to determining whether a post-sale restriction is impermissible for exceeding the patent grant is to "distinguish between the rights which are given to the inventor by the patent law and which he may assert against all the world through an infringement proceeding, and rights which he may create for himself by private contract, which, however, are subject to the rules of general, as distinguished from those of the patent, law."[341] A restriction "may not enlarge a patent monopoly to create patent infringement for something which the statute and the patent together did not give."[342]

Monsanto's Technology Agreements prohibited 1) replanting patented seeds and 2) experimenting with patented technologies.[343] These represent field-of-use limitations. The

338. *Bowman*, 657 F.3d at 1347-48.

339. *Bowman v. Monsanto Co.*, 133 S. Ct. 1761, 1767 n. 3 (2013) ("This conclusion applies however Bowman acquired Roundup Ready seed: The doctrine of patent exhaustion no more protected Bowman's reproduction of the seed he purchased for his first crop (from a Monsanto affiliated seed company) than the beans he bought for his second (from a grain elevator). The difference between the two purchases was that the first—but not the second—came with a license from Monsanto to plant the seed and then harvest and market one crop of beans."); *Bowman*, 657 F.3d at 1347-1348; *Scruggs*, 459 F.3d at 1336.

340. *Bowman*, 657 F.3d at 1347-48; *Scruggs*, 459 F.3d at 1336.

341. *Motion Picture Patents Co. v. Universal Film Co.*, 243 U.S. 502, 514 (1917).

342. *Ethyl Gasoline Corp. v. United States*, 309 U.S. 436, 625 (1940).

343. *Bowman*, 657 F.3d at 1344-1345; *Scruggs*, 459 F.3d at 1333; *Monsanto v. McFarling*, 363 F.3d 1336, 1339 (Fed. Cir. 2004).

prohibitions on replanting and experimenting do not exceed the patent grant because contract law is not being used to redefine patent infringement.[344] Any planting of patented seeds without the patentee's consent is patent infringement of the right to make. Similarly, most types of experimentation would infringe the right to make at least the claimed DNA molecules and/or plant cells.

6. Can Farmers Be Restricted from Selling F_1 Seeds They Were Authorized to Make?

Monsanto's Technology Agreements prohibited 1) selling patented seeds for replanting and 2) selling patented seeds for experimenting.[345] In *Scruggs*, the defendants probably would not have been liable for patent infringement if they had only sold patented soybean seeds for planting or experimenting—acts prohibited by the Technology Agreement. A hypothetical purchaser, like Bowman, could plant purchased seeds without the risk of infringement because of patent exhaustion, but only for a single generation because the inexhaustible right-to-make a patented plant would come into play again in the planting of the second-generation.[346]

This hypothetical purchaser could resell the seeds without any legal repercussions because the hypothetical purchaser is not bound by any contract or conditions of sale mentioned in the Technology Agreement. Thus, any subsequent sale of the seeds would be authorized.[347] Patent exhaustion of the patentee's right to exclude sale would have already occurred upon purchase and any subsequent sale would not be patent infringement. However, if the subsequent purchaser experimented or planted the seeds then this would bring the inexhaustible right-to-make into play again, resulting in patent infringement. In effect, the Technology Agreement's prohibitions on experimenting and replanting are

---

344. *Monsanto v. McFarling*, 302 F.3d 1291, 1298-99 (Fed. Cir. 2002); *see McFarling*, 363 F.3d at 1342-43.

345. *Bowman*, 657 F.3d at 1344-45; *Scruggs*, 459 F.3d at 1333; *McFarling*, 363 F.3d at 1339.

346. *See Aro Mfg. Co. v. Convertible Top Replacement Co.*, 365 U.S. 336, 346 (1961) (A purchaser's "second creation of the patented entity" calls "the monopoly, conferred by the patent grant, into play for a second time.").

347. *Cyrix Corp. v. Intel Corp.*, 846 F. Supp. 522, 538 (E.D. Tex. 1994) ("An authorized sale of the patented invention by a licensee to a third party places any resale by the third party beyond the reach of the infringement statute by reason of the third party's 'authority to resell the product' derived from the licensee.").

enforceable in the absence of any contractual relationship because the inexhaustible right-to-make will be infringed by these prohibited activities.

Because the right to make is not exhausted, Monsanto is not exceeding the scope of its patent claims by limiting the making of patented entities by contract, such as prohibiting certain types of experimentation or limiting reproduction, which by definition is the act of making of a patented entity.[348] On the other hand, the right to sell is exhausted. Monsanto is not permitted to limit the selling of products conveyed in a conditional sale, e.g. use of first-generation seeds. Of course, Monsanto is permitted to limit the selling of second-generation seeds created with authorized consent based on a licensing agreement, but Scruggs was not a licensee of Monsanto.

In summary, neither the principle of patent exhaustion nor the doctrine of patent misuse prevents patentees from severely restricting farmers' use of patented seeds. The principles of patent exhaustion and patent misuse are inapplicable to post-sale restrictions on uses that implicate the right to make because these restrictions are within the scope of the patent grant. A patentee does not exceed the scope of its patent by restricting activities that result in making new patented entities.

7. The Fine Lines between Unrestricted Sales, Conditional Sales and Licenses to Use

Patent exhaustion can be avoided by direct licensing; however, the difference between a license and a sale is not always clear. First, the conditionality of a sale is mainly a question of commercial or contract law, but the Federal Circuit has given such issues short shrift.[349] Monsanto probably considers all sales of its patented seeds merely to convey a limited license to use its patented technology, be it patented 1) plant germ cells, 2) seeds, 3) DNA molecules, 4) plant cells exhibiting specific traits, 5) plants or 6) methods of generating transgenic plants with specific traits. Monsanto has compared "transgenic seed to a rental car: when you've finished using it, you return it to the owner. In other words, the company doesn't sell seed, it just rents them, for one season, and it remains the permanent owner of the genetic information

348. This is like an eBook that cannot be distributed onto other devices without consent of the intellectual property rights owner(s). *See* Gratz, *supra*, n. 267, at 9-10.

349. *See* Patterson, *supra* n. 124, at 185-190.

contained in the seed."[350] This favors Monsanto because licensing prevents patent exhaustion.

However, litigation of different fact patterns has revealed variations in the legal categorizations of conveyances of seeds embodying Monsanto's patented technologies. In *McFarling*, the Federal Circuit considered the conveyance of patented seeds by Monsanto's licensee to be a patent license arrangement because McFarling executed a Technology Agreement.[351] In *Scruggs*, the Federal Circuit considered the conveyance of patented seeds by Monsanto's licensee a conditional sale because Scruggs did not sign any contract.[352] In *Bowman*, the conveyance of patented seeds was immaterial,[353] but the Federal Circuit suggested in dictum that it was a conditional sale because the grain elevator was only authorized to buy and sell patented seeds for use as a commodity.[354]

8. Are farmers who are not in privity limited when purchasing seeds from conditional licensees?

One question is whether patentees can indirectly limit purchasers not in privity by defining authorized sales in contracts with parties selling the products. This issue was raised in *Bowman*, but the judiciary never answered this question.[355] As a general issue, it is not clear if post-sale restrictions in the style of *General Talking Pictures* are enforceable against purchasers using patent law and whether notice of the restriction is required. A purchaser need not have any notice to be held liable for patent infringement.[356] To be held liable for damages, a purchaser might

---

350. Robin, *supra* n. 42, at 204.

351. *McFarling*, 363 F.3d at 1339, 1342-43; *McFarling*, 302 F.3d at 1293.

352. *Scruggs*, 459 F.3d at 1332-33.

353. *Bowman v. Monsanto Co.*, 133 S. Ct. 1761, 1766-67 (2013); *Monsanto Co. v. Bowman*, 657 F.3d 1341, 1347-48 (Fed. Cir. 2011); *Scruggs*, 459 F.3d at 1336.

354. *Bowman*, 657 F.3d at 1345.

355. *Id.* at 1348 ("Even if Monsanto's patent rights in the commodity seeds are exhausted, such a conclusion would be of no consequence").

356. *Jurgens v. CBK, Ltd.*, 80 F.3d 1566, 1570 n. 2 (Fed. Cir. 1996); *Blair v. Westinghouse Elec. Corp.*, 291 F. Supp. 664, 670 (D.D.C. 1968) ("It is, of course, elementary, that infringement may be entirely inadvertent and unintentional and without knowledge of the patent."); *see* Brief of Various Law Professors as Amici Curiae in Support of Respondent at 16-17, *Quanta Comp., Inc. v. LG Elec., Inc.*, 553 U.S. 617 (2008) ("The Law Has Long Recognized that Patent Law Does Not Include a Good Faith Purchaser Rule"—asserting notice is not required for patent infringement because "even an innocent infringer, without knowledge of

only need to have notice that some patented technology is involved and not of any specific conditions placed on the seller by the patentee.

A patentee might exceed the scope of its patent claims if they attempted to restrict the right to sell second-generation F_1 seeds outside of a valid licensing arrangement, such as by merely giving notice of such restrictions to purchasers. The patentee's right to exclude sale of the second-generation seed should be exhausted by the conditional sale of the first-generation seed and any attempts to limit sale might open the door to patent misuse for reaching beyond the patent grant.

It is clear that a patentee's definition of authorized sales in a patent license can have an impact on a purchaser's defense of implied license. In *Scruggs*, the Federal Circuit held that the terms of a patent license with the seller prevented a finding of an implied license, perhaps even in the absence of any notice of the terms to the purchaser.[357]

The implied license doctrine is born from principles of equity, such that the court will only find an implied license when the circumstances and objective conduct of the parties reasonably created the inference.[358] No formal granting of a license is necessary in order to raise an implied license of patent rights.[359] Any conduct on the part of the patent owner "exhibited to another from which that other may properly infer that the owner consents to his use of the patent in making or using it, or selling it, upon which the other acts, constitutes a license" and a defense to a

---

a patent" and in the absence of a contractual relationship with the patentee may be liable for patent infringement); Herbert Hovenkamp, *Post-sale Restraints and Competitive Harm: The First Sale Doctrine in Perspective*, 66 N.Y.U. Ann. Surv. Am. L. 487, 516-21, 541-43 (2011) (stating that the precedents are unclear on this issue); Zain, *supra* n. 166, at 109 (reading *General Talking Pictures* as requiring notice to accused infringer for finding patent infringement).

357. *Scruggs*, 459 F.3d at 1336 (The seed distributors "could not confer any sort of license to use the seeds").

358. *Medeco Sec. Locks, Inc. v. Lock Tech. Corp.*, 199 U.S.P.Q. 519, 524 (B.PA.I. 1976). *Lawther* provides an early example of the concept of implied license in the patent context. For an explanation of the difference between the principle of patent exhaustion and the doctrine of implied license *see* Julie Cohen and Mark Lemley, *Patent Scope and Innovation in the Software Industry*, 89 Cal. L. Rev. 1, 31-32 (2001).

359. *Wang Labs., Inc. v. Mitsubishi Electr. America, Inc.*, 103 F.3d 1571, 1578-82 (Fed. Cir. 1997); *Met-Coil Systems Corp. v. Korners Unltd., Inc.*, 803 F.2d 684, 686-7 (Fed. Cir. 1986).

patent infringement.[360] The Federal Circuit has explained that all or part of a patent owner's right to exclude can be waived by an implied license.[361] The Federal Circuit has reasoned that an implied license can arise by the patentee's conduct for products without a non-infringing use under theories such as 1) acquiescent conduct, 2) equitable estoppel or 3) legal estoppel.[362]

Monsanto should argue that all conveyances of their patented seeds are licenses and if characterized as a sale, then the sale was clearly conditional and that any implied licenses were expressly disclaimed and Monsanto's conduct never suggested any expectation of such an implied license. This raises the question of whether Monsanto's contractual conditions on farmers and grain elevators are binding and enforceable.

9. Are farmers limited by the unilateral terms of seedwrap or licensing agreements?

Another question is whether purchasers of patented seeds are forming contractual relationships with patentees, and if so, are the terms of these contracts enforceable. In *McFarling*, the Federal Circuit's answer to these two questions was yes.[363] However, the validity and enforceability of unilateral contracts of adhesion and their individual provisions remain controversial. Unilateral contracts of adhesion, like seedwrap licenses and Monsanto's Technology Agreements, might not be valid for a lack of contract formation, or individual provisions might be unenforceable because of unconscionability. In *McFarling*, Circuit Judge Clevenger dissented from the court holding enforceable the forum selection clause of Monsanto's Technology Agreement; he

---

360. *De Forest Radio Tel. Co. v. United States*, 273 U.S. 236, 241 (1927); *Hewlett-Packard Company v. Repeat-O-Type Stencil Mfg. Corp., Inc.,* 123 F.3d 1445, 1451 (Fed. Cir. 1997).

361. *See Wang Labs.*, 103 F.3d at 1580-82 (Fed. Cir. 1997) ("In patent law, an implied license merely signifies a patentee's waiver of the statutory right to exclude others from making, using, or selling the patented invention"); *Carborundum Co. v. Molten Metal Equip. Innovations,* 72 F.3d 872, 878 (Fed. Cir. 1995). Some commentators have argued that the concept of implied license applies only to conditional sales and that patent exhaustion applies only to unconditional sales. *Brief of Various Law Professors as Amici Curiae*, *supra* n. 350, at 17-18.

362. *See Wang Labs.*, 103 F.3d at 1580; *Anton/Bauer, Inc. v. PAG, Ltd.*, 329 F.3d 1343, 1350-53 (Fed. Cir. 2003); *B. Braun Med., Inc. v. Abbott Labs.*, 124 F.3d 1419, 1425 (Fed. Cir. 1997).

363. *Monsanto v. McFarling*, 363 F.3d 1336, 1340-44 (Fed. Cir. 2004).

suggested that issues of contract law required a more detailed analysis in conditional sales or in licensing of patented seeds.[364]

First, Circuit Judge Clevenger categorized the Technology Agreement as a contract of adhesion formed between parties with unequal standing in terms of bargaining power and involved take-it-or-leave-it provisions with lopsided terms favoring the drafting party.[365] He found that the terms of the Technology Agreement were not subject to negotiation and were decidedly one-sided in favor of Monsanto (e.g. forum selection clause, liquidated damages clause, legal fees clause). Second, he noted that contracts of adhesion often involve goods or services not available on alternative terms or from any other source—meaning that beyond take-it-or-leave-it, this is the only way to get it.[366] Finally, Judge Clevenger noted that these terms are generally enforceable unless the terms are substantively unconscionable.[367]

While the mere unilateral notice of restrictions to purchasers does not generally give rise to enforceable contractual restrictions, contract formation is not required to give rise to a conditional sale that prevents patent exhaustion.[368] In *Scruggs*, the failure of the purchaser to execute a contract did not mean a sale intended to be conditional automatically became unconditional. Furthermore, no notice of any restriction is required for the strict liability of patent infringement.[369]

---

364. *Monsanto v. McFarling*, 302 F.3d 1291, 1300-07 (Fed. Cir. 2002).

365. *Id.*

366. *Id.*; *see* Glen O. Robinson, *Personal Property Servitudes*, 71 U. Chi. L. Rev. 1449, 1475-76 (2004) ("Most consumer goods are sold on a take-it-or-leave-it basis. . . . no one expects to bargain with Wal-Mart over the price of electrical kitchen appliances . . . it is quaint to think about replacing standardized mass marketing with the methods of a Turkish bazaar.").

367. *McFarling*, 302 F.3d at 1296 n. 3, 1301. Contractual terms are also unenforceable if they violate public policy, which might include terms considered patent misuse for attempting to expand the scope of the patent with an anticompetitive effect.

368. *Mallinckrodt, Inc. v. Medipart, Inc.*, 976 F.2d 700, 708 n. 7 (Fed. Cir. 1992) ("In accordance with the Uniform Commercial Code a license notice may become a term of sale, even if not part of the original transaction, if not objected to within a reasonable time. U.C.C. § 2-207(2)(c)."); *see* s*upra* n. 350. For example in *General Talking Pictures*, the absence of a contract with the purchaser did not prevent a holding of patent infringement for violating a field-of-use restriction. In addition, mere notice of a restriction can become a condition of sale under the U.C.C. *Mallinckrodt*, 976 F.2d at 708 n. 7.

369. *Supra* n. 350; Chiappetta, *supra*, n. 266, at 1125-1132; *Brief of Wisconsin Alumni Research Found. et al. as Amici Curiae in Support of Respondent*, *supra* n. 230, at 25-27.

In addition, the *Scruggs* court held that the purchaser could not have expected to have an implied license when he admitted to being aware of conditions in the seedwrap and/or Technology Agreements.[370] This means that a purchaser's awareness of patentee conduct that expressly shows the patentee's intent to limit or condition the sale of product can be important with regard to an implied license defense in the absence of any contractual relationship.

In summary, the Federal Circuit's new doctrine is that the right to make a patented, second-generation organism is inexhaustible. Although this right can be implied, implied rights can always be disclaimed by the patentee. The principle of patent exhaustion does not prevent a patentee of a self-replicating product from imposing extensive, post-sale restrictions under threat of patent infringement. First, farmers' use of patented seeds can be limited if the seeds were purchased from licensees with knowledge of the patented technology they embody. Second, farmers can be limited by conditions of sale expressed in seedwrap agreements. Third, the right to exclude the use of a second-generation seed is not exhausted by granting the right to plant a first-generation seed or by the authorized selling of a first-generation seed embodying patented technology.

B. The Inexhaustible Right to Exclude Reproduction Doctrine Does Not Violate the Goals of Patent Exhaustion or Patent Misuse

The policy goals of patent exhaustion and patent misuse should be considered before applying these doctrines to self-replicating products. Both patent exhaustion and patent misuse are creatures of patent law so their rationales should be based primarily in the public policies underlying patent law, not in antitrust doctrines or property law theories of free trade. Patent law should set the balance between rewarding the patentee while guarding "the rights and welfare of the community."[371] However,

---

370. *Monsanto v. Scruggs*, 459 F.3d 1328, 1336 (Fed. Cir. 2006); *Monsanto Co. v. Scruggs*, 249 F. Supp. 2d 746, 752 (N.D. Miss. 2001) (Scruggs "admits he was aware of the conditions under which Monsanto licenses its technology to seed companies and farmers").

371. *Kendall v. Winsor*, 62 U.S. 322, 329 (1859) ("Whilst the remuneration of genius and useful ingenuity is

a duty incumbent upon the public, the rights and welfare of the community must be fairly dealt with and effectually

guarded.").

it is difficult to set this balance when the goals of patent exhaustion and patent misuse are unclear and mutable.

1. The Goals Underlying the Principle of Patent Exhaustion – Setting Limits on the Patent Grant's Scope

The policies underlying the principle of patent exhaustion are hazy.[372] The principle of patent exhaustion, along with the doctrine of patent misuse, serves to 1) confine the patent grant to the scope of its claims[373] and 2) confine the patent right to the scope intended for all patentees.[374] In addition, patent exhaustion *may* serve to 3) prevent restrictions on trade colored by "deep misgivings about attaching permanent restrictions to personal property" [375] and 4) prevent double-dipping—i.e. patentees collecting duplicate royalties.[376]

For example, the principle of patent exhaustion has been recognized as playing an important role in preventing rent seeking by patentees by authorizing the sale of uncompleted inventions and then taxing purchasers or users who use common and non-inventive materials or processes to produce the completed invention.[377] This shows all the possible goals at work. First, the

---

372. Dufrense, *supra* n. 106, at 13.

373. *Keeler v. Standard Folding Bed Co.*, 157 U.S. 659, 661, 664 (1895) (patent exhaustion defines when a product has "passed outside of the monopoly"); *Bauer v. O'Donnell*, 229 U.S. 1, 17 (1913) (patent exhaustion defines when a product has moved "beyond the limits of the monopoly secured by the patent act").

374. *Motion Picture Patents Co. v. Universal Film Co.*, 243 U.S. 502, 513-16 (1917) ("a grant only of the right to an exclusive use of the new and useful discovery which has been made,-this and nothing more. This construction gives to the inventor the exclusive use of just what his inventive genius has discovered. It is all that the statute provides shall be given to him and it is all that he should receive, for it is the fair as well as the statutory measure of his reward for his contribution to the public stock of knowledge. . . . the exclusive right granted in every patent must be limited to the invention described in the claims of the patent").

375. Dufrense, *supra* n. 106, at 13; Rinehart, *supra* n. 75, at 486, 492 ("accommodate the free movement of patented goods in commerce" colored by "deep misgivings about attaching permanent restrictions to personal property").

376. *Cyrix Corp. v. Intel Corp.*, 846 F. Supp. 522, 539 (E.D. Tex. 1994); Hovenkamp, *supra* n. 350, at 513-515 (e.g. collecting royalties at multiple steps in a chain of distribution). This purpose of patent misuse has been described as empty. Glen O. Robinson, *Personal Property Servitudes*, 71 U. Chi. L. Rev. 1449, 1498 (2004). "Double dipping" has been described as collecting royalties from two different parties on the same patented product at two different stages of production.

377. *Quanta Comp., Inc. v. LG Elec., Inc.*, 553 U.S. 617, 633 (2008).

patent grant is confined to its claim scope by the non-inventive restriction. Second, the patent right is limited to a single reward to be received either upon selling either an incomplete or completed invention, at the patentee's discretion. Third, the unfinished invention is prevented from having a patent law-based restriction attached to it after sale that restrains the freedom of trade and moves with personal property. Finally, the patentee is prevented from extracting royalties at multiple stages of production of the invention.

However, not all of these purported goals seem legitimate. The putative goal of preventing restrictions on trade tied up in personal property is not forbidden by patent law. Patented products and methods almost always incur short-term costs affecting trade, e.g. higher prices, licensing costs, and numerous "transaction costs" related to freedom to operate, patent thickets, designing around, etc. These costs are tolerated in the patent system as part of the balance set by Congress to create long-term societal benefits of innovation and disclosure.

Patent law creates situations that are contrary to deep misgivings about permanent restrictions attached to property. For example, personal property with non-infringing uses can embody intangible patent rights granted in the form of process patent claims and create potential patent infringement liabilities based on how the property is used that move with personal property.[378]

The claimed goal of preventing patentee double dipping might be more of a side effect than a motivating principle behind the principle. Patentees are entitled to their pecuniary reward, a reward that is limited by patent law only to the boundaries of the patent rights and their specific patent claims. Patent exhaustion cuts off patent rights, which might result in the prevention of collecting multiple royalties at different steps in manufacturing.

---

378. For example, the purchase of a non-infringing product can still lead to infringement based on the manner in which it is used by the purchaser or a downstream user. *See Ricoh Co., Ltd. v. Quanta Computer Inc.*, 550 F.3d 1325, 1334-43 (Fed. Cir. 2008) (patents directed to optical recording methods for recording information to rewritable optical discs could be infringed by using a device in a certain way, but not by the making, selling or using of the same product when it has substantially non-infringing uses); *NTP, Inc. v. Research In Motion, Ltd.*, 418 F.3d 1282, 1317-18 (Fed. Cir. 2005) (method patent claims to systems "for transmitting originated information from one of a plurality of originating processors in an electronic mail system to at least one of a plurality of destination processors in the electronic mail system" could be infringed by using a device in a certain way, but not by the making, selling or using of the same device when it has substantially non-infringing uses.).

However, patent law does not forbid double dipping. For example, a licensor with multiple licensees working at different stages in manufacturing can be forced by the use of patent law to pay multiple royalties.

In summary, the most genuine goals of patent exhaustion are to confine the patent grant 1) to the scope of its claims and 2) to the power granted to all patent owners.[379] The presence of double dipping and permanent restrictions on property are tolerated within intellectual property law.

2. The Goals Underlying the Doctrine of Patent Misuse – Setting Limits on Patentee Conduct

The policies underlying the doctrine of patent misuse are hazy as well. The purpose of the patent misuse doctrine has been stated as being "to prevent a patentee from using the patent to obtain market benefit beyond that which inheres in the statutory patent right."[380] But it is not always clear what market benefits exceed the patent grant, resulting in a mutable doctrine in which various courts offer diverse public policy justifications.

In *Mercoid*, the Supreme Court held that a patent licensing arrangement constituted patent misuse because it attempted to expand the scope of the patent monopoly by tying a patented product to an unpatented product. The Court declared that if the patentee is allowed to "attach something which does not possess the quality of invention," that would divert patent law "from its statutory purpose and become a ready instrument for the economic control in domains" where antitrust law or other laws define public policy.[381] This opinion shows one goal of patent misuse is preventing the over-reward of patentees by not allowing patentees to expand their patent rights monopoly using contracts and then use the patent grant as a shield from the general law, such as antitrust law.

> The patent is a privilege. . . . conditioned by a public purpose . . . When the patentee ties something else to his invention, he acts only by virtue of his right as the owner of property to make contracts concerning it and not otherwise. He then

379. *But see* Rinehart, *supra* n. 75, at 519-22 (arguing that it is not even possible to define the scope of the patent grant in practice and attempts to approximate it are difficult and expensive).

380. *Mallinckrodt, Inc. v. Medipart, Inc.*, 976 F.2d 700, 704 (Fed. Cir. 1992).

381. *Mercoid Corp. v. Mid-Continent Inv. Co.*, 320 U.S. 661, 666 (1944).

> is subject to all the limitations upon that right which the general law imposes upon such contracts. The contract is not saved by anything in the patent laws because it relates to the invention.[382]

Patent misuse *may* serve to 1) prevent the over-reward of patentees based on conduct that serves no other purpose but to enrich the patentee at the expense of a *downstream* user;[383] 2) prevent harm to innovation based on patent leverage;[384] 3) deter sham patent infringement claims;[385] and 4) help police the fraudulent procurement of patent rights.

Whatever motivated the creation of patent misuse, the anticompetitive effect required for a holding of non-*per se* patent misuse informs that the current purpose of patent misuse is related to protecting competition, which is the goal of antitrust law. The doctrine of patent misuse "stands as a vital guardian" of the patent system's main goal of promoting innovation and invention.[386] However, patent misuse often is instead found by courts to prevent conduct involving patents deemed to be against other public policies such as restraining trade or defrauding the patent system. Thus, the doctrine of patent misuse might serve some purposes of antitrust law by providing 1) an antitrust law backup or antitrust gap filler to catch anticompetitive conduct missed by antitrust law and 2) an additional penalty for anticompetitive conduct that renders a patent unenforceable against anyone until the misuse is purged. The doctrine of patent misuse allows anticompetitive

---

382. *Id.*

383. Christina Bohannan, *IP Misuse as Foreclosure*, 96 Iowa L. Rev. 475, 482-86 (2011); Vincent Chiappetta, *Living with Patents: Insights from Patent Misuse*, 15 Marq. Intell. Prop. L. Rev. 1, 40-45 (2011).

384. *See* Bohannan, *supra* n. 377, at 497-525; Chiappetta, *supra* n. 377, at 18 ("misuse exists to prevent interference with the proper implementation of patent public policy, a role independent of (although perhaps over-lapping with) antitrust law's objectives.").

385. *See* Thomas Cotter, *Four Questionable Rationales for the Patent Misuse Doctrine*, 12 Minn. J.L. Sci. & Tech. 457, 480-85 (2011).

386. Joe Potenza *et al.*, *The Insufficiency of Antitrust Analysis for Patent Misuse*, 15 Fed. Cir. B.J. 69; 55 Hastings L.J. 399 (2003). The doctrine of patent misuse might serve some purposes of antitrust law by providing 1) an antitrust law backup or antitrust gap filler to catch anticompetitive conduct missed by antitrust law and 2) an additional penalty for anticompetitive conduct that renders a patent unenforceable against anyone until the misuse is purged. *B. B. Chemical Co. v. Ellis*, 314 U.S. 495 (1942). The doctrine of patent misuse allows anticompetitive behavior that might otherwise be shielded from antitrust law by the presence of patent rights to be remedied under patent law.

behavior that might otherwise be shielded from antitrust law by the presence of patent rights to be remedied under patent law.

Like the principle of patent exhaustion, the doctrine of patent misuse *should* serve to confine the patent grant to Congress's intended scope when creating the patent system based on the optimal balancing of public interests.[387] Congress intended patentees to have the opportunity to create a market monopoly and exert patent leverage over others, but only within the scope of their patent rights. Thus, the doctrine of patent misuse should limit the boundaries of patent rights by defining which conduct is impermissible after considering the balancing of public interests within the patent system. However, the modern goal of the doctrine of patent misuse is to condemn anticompetitive behavior that exceeds the patent grant and to condemn conduct with no redeeming value, such as fraud on the USPTO. At the core of the concept of patent misuse is the scope of the patent grant to each patentee, not anticompetitive conduct, because the doctrine of patent misuse permits various anticompetitive behaviors that remain within the bounds of the patent grant.

In conclusion, the goals of the doctrines of patent exhaustion and patent misuse overlap. Patent exhaustion is less discerning than patent misuse in that it limits rights in the absence of any anticompetitive effect. However, patent misuse is less discerning than patent exhaustion in that it cannot be prevented by contract. Both doctrines confine the patent grant by cutting of rights or behavior that exceed either the scope of the specific patent grant at issue or the general patent power given to all patentees. This prevents patentees from upsetting the balance of the patent system as set by Congress and limits the scope of patent use to what was intended by Congress. The Supreme Court noted the necessity of confining patent rights because inappropriate patents "might stifle, rather than promote, the progress of useful arts."[388]

3. The Right to Make is a Unique Patent Right within the Principle of Patent Exhaustion

According to the doctrine of the inexhaustible right to exclude reproduction, if a patent claim is directed to an organism sold as a product, then conduct resulting in the reproduction of a purchased organism to produce a new, infringing organism can

387. *See* Bohannan, *supra* n. 377, at 497.

388. *KSR Int'l Co. v. Teleflex Inc.,* 550 U.S. 398, 427 (2007).

constitute patent infringement of the right to make. This definition of infringement is both within the scope of the claims (the patent claim must read on the progeny produced) and within the scope of the general patent grant ("the right to make"). The right to make granted in general to all patentees defines infringement as the construction of a new, patent-infringing entity for any purpose.[389] The sold product "may not be the vehicle for a 'second creation of the patented entity'" because "such re-creation exceeds the rights that accompanied the initial sale."[390]

This doctrine does not create an exception based on self-replicating technologies but rather is consistent with the doctrine of impermissible reconstruction traditionally used for manufactured inventions mentioned in the discussion of *Jazz Photo* in part II (A)(5). It may seem that the patentee's opportunity to collect royalties for each growing season is a form of "taxing" users or collecting duplicate royalties. However, this is not true when a "new" infringing entity is created upon reproduction, meaning its patented technology is exploited.[391] Thus, this doctrine satisfies three of the four goals of patent exhaustion, leaving unmet only the goal of preventing restrictions on trade colored by the disfavor to permanent restrictions on personal property. In serving the goals of patent exhaustion to confining the patent grant to its intended boundaries, this doctrine also serves the goals of patent misuse by defining what is not exceeding the patent grant despite its effects on all downstream users.

C. A Stronger Patent Exhaustion Doctrine Might Reduce Incentives to Invest in Self-Replicating Technologies

Quanta has been read in different ways; it has invigorated a debate about patent exhaustion and cast uncertainty over how patentees can legally control their patent rights embodied in products conveyed into the marketplace.[392] Many have argued for a stronger application of patent exhaustion by eliminating the *Mallinckrodt* doctrine as well as preventing patent rights to travel around with seeds forever, basing their arguments on the policy grounds underlying the goals of patent exhaustion and/or

389. *See Aro Mfg.*, 365 U.S. at 346; *Jazz Photo*, 264 F.3d at 1105.

390. *Id.*

391. *See Ma, supra* n. 319, at 711-13.

392. *Static Control Components, Inc. v. Lexmark Int'l, Inc.*, 615 F. Supp. 2d 575, 585-86 (E.D. Ky. 2009); Austin, *supra* n. 166, at 2961-2969; Dong, *supra* n. 6, at 23-62; Dufrense, *supra* n. 106, at 34-47; McCammon, supra n. 270, at 790-796; Rinehart, *supra* n. 75, at 502-503; Zain, *supra*, n. 166, at 100-103.

economic theory.[393] For example, some commentators argue that the principle of patent exhaustion should be applied broadly and robustly because 1) contract law is being used to privately alter the patent law balance set by Congress;[394] 2) neither the doctrine of patent misuse nor antitrust law adequately serves the purpose of protecting downstream purchasers;[395] 3) having the onus on purchasers for the strict liability of patent infringement creates transaction costs and waste;[396] 4) this decreases allocation inefficiencies and waste;[397] 5) weaker principles of patent exhaustion harm competition and innovation;[398] and 6) the law is suspicious about servitudes on personal property.[399]

"Many a case becomes important not for what it says, but for what later courts understand it to mean."[400] There is a battle of ideas to persuade future courts about how to apply the principle of patent exhaustion. Some commentators argue that *Quanta* should establish a precedent of applying a liberal and broad principle of patent exhaustion that, at least, limits the *Mallinckrodt* doctrine. However, these arguments might mistakenly have taken too much stock in the Supreme Court's statement in *Quanta* that "patent exhaustion provides that the initial authorized sale of a patented item terminates *all* patent rights to that item."[401] This statement is misleading because the right to make is rarely exhausted by an authorized sale.[402] In addition, many commentators and amici

---

393. Hungar, *supra* n. 270, at 527-534; Ma, *supra* n. 319, at 713-716; Justin T. Rogers, student author, *The Encroachment of Intellectual Property Protections on the Rights of Farmers*, 15 Drake J. Agric. L. 149, 158-60 (2010); Zain, *supra* n. 166, at 107-120.

394. Brief for Petitioners at 47, *Quanta Comp., Inc. v. LG Elec., Inc.*, 553 U.S. 617 (2008); Patterson, *supra* n. 124, at 191-211.

395. Zain, *supra*, n. 166, at 113-17 ("patent misuse has fallen out of favor" and courts give deference "whenever a government sanctioned patent 'monopoly' is involved").

396. Chiappetta, *supra* n. 266, at 1125-32.

397. *Id.* at 1127-32.

398. *Id.* at 1132-35.

399. *Brief for Petitioners*, *supra* n. 388, at 46; Dufrense, *supra* n. 106, at 14-15; Rinehart, *supra* n. 75, at 525-526 (sold patented products "should be free to find the highest valued user in the market"). Professor Rinehart proposed the principle of patent exhaustion be applied as a pliability rule, but this argument fails in the situation of self-replicating products because all possessors become potential producers, meaning the patentee cannot control market output.

400. Edward E. Chase and Julia P. Forrester, Property Law (2d. LexisNexis 2010).

401. *Quanta Comp., Inc. v. LG Elec., Inc.*, 553 U.S. 617, 625 (2008) (emphasis added).

402. *Supra* pt. II (C)(5).

briefs expected the *Quanta* opinion to involve more sweeping issues; however, the case turned out to be very narrowly decided.

1. A Strong Patent-Exhaustion Doctrine Might Reduce Incentives to Develop Self-Replicating Products

A main policy goal underlying patent law is the incentive to innovate. If patent rights in self-replicating products can be exhausted too easily or completely eviscerated, then this incentive is severely weakened.[403] This point was stressed by the Federal Circuit in *Scruggs* and *Bowman*.[404] By the end of the twentieth century, Monsanto had already spent hundreds of millions of dollars on research and development of genetically modified plants, new plant traits and methods of making transgenic plants.[405]

---

403. Transcript of Bowman, Oral Argument at *51-52, *Bowman v. Monsanto Co.*, 133 S. Ct. 1761, 1766-67 (2013) (2013) (No. 11-796) (Mr. Waxman, representing Monsanto, said "let's look at vaccines. Because the Roundup Ready gene essentially immunizes soybean plants from the herbicide in the same way that a life-saving vaccine will immunize individuals that receive it from some external – it wouldn't be a herbicide – a life threat. Okay. Vaccines are live. They have live cultures; they can regenerate themselves. If a company develops the vaccine for, you know, H1 – I shouldn't be using – an important life-saving vaccine - (Laughter.) – it's unsupportable to say that you cannot sell a quantity of that vaccine without exhausting all of your rights in it. I mean, when -- when Schering-Plough or Bristol-Myers develops a vaccine and sells some of it to CVS so I can go in and get injected, they haven't lost all of their patent rights in that vaccine. CVS can't turn around and become a competitor."); *see* Brief of N.Y. Intell. Prop. Law Assn. as Amici Curiae in Support of Respondent at 36-39, *Bowman v. Monsanto Co.*, 133 S. Ct. 1761 (2013) (No. 11-796); Sheff, *supra n.* 326, at 243-245; *Ma, supra* n. 319, at 711-13.

404. *Bowman*, 133 S. Ct. at 1767 ("After inventing the Roundup Ready trait, Monsanto would, to be sure, 'receiv[e] [its] reward' for the first seeds it sells. *Univis*, 316 U. S., at 251. But in short order, other seed companies could reproduce the product and market it to growers, thus depriving Monsanto of its monopoly. And farmers themselves need only buy the seed once, whether from Monsanto, a competitor, or (as here) a grain elevator. The grower could multiply his initial purchase, and then multiply that new creation, *ad infinitum*—each time profiting from the patented seed without compensating its inventor." "That is because, once again, if simple copying were a protected use, a patent would plummet in value after the first sale of the first item containing the invention. The undiluted patent monopoly, it might be said, would extend not for 20 years (as the Patent Act promises), but for only one transaction. And that would result in less incentive for innovation than Congress wanted."); *Monsanto Co. v. Bowman*, 657 F.3d 1341, 1347-48 (Fed. Cir. 2011); *Monsanto v. Scruggs*, 459 F.3d 1328, 1336 (Fed. Cir. 2006).

405. Brief of Am. Seed Trade Ass'n as Amicus Curiae in Support of Neither Party at 11-12, *Quanta Comp., Inc. v. LG Elec., Inc.*, 553 U.S. 617 (2008); Brief of CropLife International as Amicus Curiae in Support of Neither

These costs can be capitalized in an economically efficient way by spreading remuneration to the technology developers over many users and/or the same users upon many uses.

Does society want to promote investment and research into self-replicating technologies that might be sold as products? The assumed answer is yes. If a subject is patent-eligible, then that suggests patent law aims to incentivize innovation and invention of that subject matter. The incentive provided by the patent system is both the pecuniary reward derived from a twenty-year term of exclusive patent rights and the potential to charge monopoly prices in the marketplace during the patent term. This incentive would disappear if patent exhaustion applied to the right to make a self-replicating product, whether sold in a conditional sale or an unrestricted, authorized sale.

Although a strong patent exhaustion doctrine that ignored self-replicating technologies would fulfill most of the six reasons supporting a broad and robust application of the principle of patent exhaustion, licensees still could be restricted in their right to sell a patented product. A strong patent exhaustion doctrine might push patentees of self-replicating technologies to convey self-replicating products only via licenses. This might result in mass-marketed licensing arrangements paralleling those used in the software industry where the line between license and sale is blurred.[406] Under this proposal, self-replicating products will never be sold and will only be replicated in the context of patent licensing arrangements, which probably was Monsanto's model.

2. A Strong Patent-Exhaustion Doctrine Might Lower Costs via Secondary Markets

McFarling argued that Monsanto's Technology Agreement's prohibitions on replanting and selling second-generation seeds for replanting was unenforceable because of patent exhaustion. He argued this contract restriction prevented the formation of a secondary market for non-first-generation

---

Party, *supra* n. 46, at 7; Jay P. Kesan, *Licensing Restrictions and Appropriating Market Benefits from Plant Innovation*, 16 Fordham Intell. Prop., Media & Ent. L.J. 1081, 1082-83 (2006).

406. The Ninth Circuit held "that a software user is a licensee rather than an owner of a copy where the copyright owner (1) specifies that the user is granted a license; (2) significantly restricts the user's ability to transfer the software; and (3) imposes notable use restrictions." *Vernor v. Autodesk, Inc.*, 621 F.3d 1102, 1111 (9th Cir. 2010).

patented seeds, which would result in lower prices.[407] McFarling accused Monsanto of impermissibly inflating patented seed prices by contracting around patent exhaustion. Similarly, Bowman argued that to consider the planting of unsegregated commodity seeds to be patent infringement would eliminate a low cost but high risk source of herbicide resistant seeds.[408]

The counter argument is that a main goal of the patent system is to incentivize innovation and invention by providing a pecuniary reward to patentees that includes the potential to charge monopolistic prices. The secondary market itself can be considered a form of free-riding that patent law seeks to reduce.[409] On the other hand, Monsanto did not invent anything related to the secondary market itself, such as an innovation in the distribution of seeds. There is no clear answer to this question because there is no clear standard for the Supreme Court's vague principle that the patentee is entitled to conduct "normally and reasonably adapted to secure pecuniary award" by using "conditions the performance of which is reasonably within the reward which the patentee by the grant of the patent is entitled to secure" in order to receive remuneration within the scope of their patent rights.[410]

The fact that a practice maintains higher prices and prevents competition does not automatically mean it should be condemned by the doctrines of patent exhaustion and/or patent misuse.[411] For patent law to condemn a practice, it must exceed the scope of the patent grant. While patent exhaustion might be applied as a way to prevent the prohibition on replanting imposed as a condition of sale, this practice might also result in weakening the incentive to develop self-replicating products by reducing the patentees remuneration or instead may result in prices being raised even higher as patentees try to extract more remuneration in the primary market.

3. A Strong Patent-Exhaustion Doctrine Might Force Reliance on Technological Restraints

---

407. Savich, *supra* n. 7, at 128.

408. *Monsanto Co. v. Bowman*, 686 F. Supp. 2d 834, 836-37 (S.D. Ind. 2009).

409. *See* Patterson, *supra* n. 124, at 213-220.

410. *See United States v. Gen. Elec. Co*, 272 U.S. 476, 489-90 (1926).

411. *Id.* at 490-94.

The result of a broad and liberal patent-exhaustion doctrine might lead to technological restraints on self-replicating products, e.g. engineering away their ability to self-replicate. Monsanto already has the capacity to render plant seeds infertile, which could be used to enforce a single planting restriction via genetic technology.[412] This is similar to the use of digital rights management to prevent copyright infringement or other activities difficult to enforce using the legal system.[413]

Engineered sterility is a very effective way to prevent the propagation of a patented organism and should reduce competition via secondary markets and follow-on improvements. Genetic technologies to accomplish this are referred to as "terminator technology" or "genetic use restriction technologies" (GURTs), and utilize DNA sequences inserted into an organism's genome that can render it or its progeny sterile.[414] These genetic restraints are capable of restricting an organism to a single generation that can be sold without the ability to produce progeny. In addition, transgenic-based technologies for sterility are patented.[415]

The sale of patented seeds that produce either sterile progeny or are incapable of producing progeny would not violate any law, as long as it first received regulatory approval. This approach would ensure that farmers must purchase seeds every growing season from patent owners like Monsanto. For example, Monsanto could incorporate sterility technology into Roundup

412. Andrew Pollack, *Monsanto Buys Delta and Pine Land, Top Supplier of Cotton Seeds in U.S.*, N.Y. Times (August 16, 2006).

413. Savich, *supra* n. 7, at 129-133.

414. Melissa J. Hills, et al., *Genetic use restriction technologies (GURTs): strategies to impede transgene movement*, 12 Trends Plant Sci. 177 (2007); Hani Al-Ahmad, et al., *Mitigation of establishment of Brassica napus transgenes in volunteers using a tandem construct containing a selectively unfit gene*, 4 Plant Biotechnol. J. 7 (2006); Sina Muscati, *Terminator Technology: Protection of Patents or a Threat to the Patent System?*, 45 IDEA 477 (2005); Johann P. Schernthaner, et al., *Control of Seed germination in transgenic plants based on the segregation of a two-component genetic system*, 100 PNAS 6855 (2003); C. Neil Stewart, et. al., *Transgene introgression from genetically modified crops to their wild relatives*, 4 Nat. Rev. Genet. 806 (2003); Henry Daniell, *Molecular strategies for gene containment in transgenic crops*, 30 Nat. Biotechnol. 581 (2002).

415. *See, e.g.*, U.S. Patent Nos. 5,723,765 (filed Nov. 7, 1995); 5,808,034 (filed Aug. 22, 1994); 5,925,808 (filed Dec. 19, 1997); and 5,977,441 (filed Apr. 22, 1998).

Ready®, Bollgard® and DroughtGard®[416] plants to protect its patent rights and help ensure receipt of its reward for its invention. Some might think an engineered sterility approach over-rewards Monsanto, but surely it does not. It only gives Monsanto a reward similar to that which could be achieved by the "no replant" policy of their Technology Agreements or adherence to the Supreme Court's inexhaustible right to exclude reproduction doctrine.

Some argue that this sterility-based technological solution might be of overall benefit by reducing total costs to society.[417] In contrast, it has been speculatively argued that this would incur higher costs on society.[418] Without technological restraints, the cost of monitoring for patent infringement might be very high and presumably would be passed along to the purchaser and, ultimately, to the consumer.[419] In addition, the cost of patent litigation is high. Thus, farmers who face penalties for violating their licenses or conditions of sale are probably better off not even having the possibility of violating them. If plants with genetically engineered sterility are used by Monsanto, then farmers like McFarling, Scruggs and Bowman might well be financially better off. Farmers would only have to pay a yearly technology fee, which could be reduced by the patentee's savings on monitoring costs, and could avoid costly litigation and/or settlement agreements.

In addition, genetically engineered sterility might be bioprotective by reducing biocontamination of the environment with artificial DNA, such as RoundUp® resistance-encoding DNA

---

416. *See, e.g.*, U.S. Patent Nos. 6,441,277 (filed June 16, 2002) and 7,786,353 (filed Sept. 29, 2004).

417. Hills, *supra* n. 411; Jeremy P. Oczek, *In the Aftermath of the "Terminator" Technology Controversy: Intellectual Property Protections for Genetically Engineered Seeds and the Right to Save and Replant Seed*, 41 B.C.L. Rev. 627, 653-57 (2000); *see* C.J. Arntzen, et al., *GM crops: science, politics and communication*, 4 Nat Rev Genet., 839 (2003); Stewart, *supra* n. 411, at 813-15; Daniell, *supra* n. 411, at 814.

418. *See* Savich, *supra* n. 7, at n. 235; Brief of Economists as Amici Curiae in Support of Respondents at 21-22, *Bowman v. Monsanto Co.*, 133 S. Ct. 1761 (2013).

419. In the 1990s, Monsanto reportedly spent about $10 million per year on "gene police" to search for patent infringers, referred to as "seed pirates." Some investigations were agreed to by farmers based on the terms of Monsanto's Technology Agreements. Investigations included aerial surveillance of farms and "entrapment" by actors posing as seed purchasers. In 1998, Monsanto established a tipline (1-800-ROUNDUP) where farmers could turn in their neighbors for "seed piracy." Rick Weiss, *Seeds of Discord*, Washington Post (Feb. 3, 1999); Robin, *supra* n. 42, at 204.

molecules.[420] On the other hand, one might argue that the use of sterility genes in plants might lead to the biocontamination of the environment with the DNA molecules causing sterility: however, natural selection should either kill off the organisms expressing these contaminating DNAs or quickly inactivate or suppress these sterility-causing DNA sequences.[421]

4. A Strong Patent-Exhaustion Doctrine Might Force Sole Reliance on Contract Law

Currently, both patent law and contract law remedies are available to patentees trying to enforce post-sale restrictions. The Supreme Court has repeatedly left the door open to the possibility of contract remedies after finding patent exhaustion.[422] Even if patent exhaustion occurs, a patentee can still try to hold a purchaser liable for breaching the conditions of the sale using contract law. Similarly, if a post-sale restriction exceeds the scope of the patent, such a limitation is not enforceable under patent law, but it may be enforceable under contract law.[423]

The future understanding of *Quanta* may serve to limit, modify or even discard the *Mallinckrodt* doctrine. If the *Mallinckrodt* doctrine were to be completely overruled, contract law would be the only available option for patentees trying to control their products once they were conveyed by sales. It has been argued that contract law alone can provide patentees the

---

420. Charles Kwit, et al., *Transgene introgression in crop relatives: molecular evidence and mitigation strategies*, 29 Trends in Biotech. 284 (2011); R.S. Hails & K. Morley, *Genes invading new populations: a risk assessment perspective*, 20 Trends Ecol. Evol. 245 (2005); Muscati, *supra* n. 411, at 500-01; Stewart, *supra* n. 411.

421. *See* Stewart, *supra* n. 411, at Box 2.

422. *Quanta Comp., Inc. v. LG Elec., Inc.*, 553 U.S. 617, 637 n. 7 (2008) (the Supreme Court offered "no opinion on whether contract damages might be available even though exhaustion operates to eliminate patent damages."); *Motion Picture Patents Co. v. Universal Film Co.*, 243 U.S. 502, 513 (1917); *Keeler v. Standard Folding Bed Co.*, 157 U.S. 659, 666 (1895). Monsanto won a breach of contract claim against McFarling for replanting second-generation seed in contravention to the terms of the Technology Agreement that McFarling executed. *Monsanto v. McFarling*, 363 F.3d 1336, 1340 (Fed. Cir. 2004).

423. *Amgen, Inc. v. Chugai Pharm. Co.*, 808 F. Supp. 894, 903 (D. Mass. 1992). Restricting the use of an organism by contract is generally enforceable by contract law. *See Wilson v. Davis*, 2010 WL 2228262 (W.D. Ky. 2010); *Curry v. Bennett*, 301 S.W.3d 502 (Ky. Ct. App. 2009); *In re Calumet Farm*, 150 BR 664 (Bankr. ED Ky. 1992).

protection they desire;[424] however, others have argued that contract law alone does not provide an adequate alternative, harms innovation and prevents the procompetitive benefits of the *Mallinckrodt* doctrine.[425]

Patent infringement and breach of contract actions differ significantly. The main disadvantages of relying exclusively on contract law are the reduced types of remedies and the unavailability of injunctive relief against parties not in privity.[426] Patent law provides a wider range of remedies, such as treble damages and attorney's fees for willful infringement, than contract law.[427] Furthermore, contract remedies would probably result in compulsory licensing for what would have been considered patent infringement under the *Mallinckrodt* doctrine. Finally, contract law is state-specific, meaning patentees' ability to restrict the use of their patented products would be subject to the idiosyncrasies of each state's legislature.[428]

5. How Should Contract Law Handle Restrictions Made Unenforceable by Exhaustion?

If patent exhaustion occurs, then it is not clear how a contractual provision that restricts an exhausted patent right should impact the availability of contract law remedies and defenses. The Federal Circuit has repeatedly noted that a finding of patent misuse based on a contractual restriction causes a patentee to lose their right to sue for breach of contract for the violation of that restriction.[429] This is because violating the patent law policy "to

---

424. Dufrense, *supra* n. 106, at 45-47; *see also* Brief of Dell Inc., *et al.* in Support of Petitioners at 23-24, *Quanta*, 553 U.S. 617 (2008).

425. Brief of the Biotech. Indus. Org. as Amici Curiae in Support of Respondent at 34-38, *Bowman v. Monsanto Co.*, 133 S. Ct. 1761 (2013); Brief of Economists as Amici Curiae in Support of Respondents, *supra* n. 415, at 23-33; Brief of the Biotechnology Industry Organizations as Amicus Curiae in Support of Neither Party, *supra* n. 46, at 29-33; Brief of CropLife Int'l as Amicus Curiae in Support of Neither Party, *supra* n. 46, at 12-13; Brief of the International Business Machines Corp. as Amicus Curiae in Support of Petitioners, *supra* n. 112, at 32-34; Patterson, *supra* n. 124, at 224-225; Sheff, *supra* n. 326, at 246-47.

426. *See* Brief of CropLife Int'l as Amicus Curiae in Support of Neither Party, *supra* n. 46, at 13.

427. *See* Brief of Am. Seed Trade Ass'n as Amicus Curiae in Support of Neither Party, *supra* n. 399, at 21 n.33

428. Leaven, *supra* n. 172, at 139-142.

429. *Princo Corp. v. Int'l Trade Commn.*, 616 F.3d 1318, 1328 (Fed. Cir. 2010) (en banc) ("When those contractual conditions violate public policy, however, as in the case of price-fixing conditions and tying restraints, the underlying patents become unenforceable, and the patentee loses its right to sue

prevent a patentee from using the patent to obtain market benefit beyond that which inheres in the statutory right" also violates public policy.[430] Thus, patent misuse is indirectly an affirmative defense to some breach of contract claims. But what about patent exhaustion?

In *Motion Picture Patents*, the Supreme Court reasoned that an attempt to expand the scope of a patent using contract is impermissible, suggesting that a contractual provision is void or unenforceable.[431] The Court did not say explicitly whether a contract action could rely on terms that contracted around patent exhaustion; however, the Court did hint that if there was a contract action, then this restriction "is plainly void" because the restriction "would be gravely injurious to the public interest" in motion pictures, an "important element in the amusement life of the nation."[432]

A new contract law defense could be created, based on patent exhaustion and/or patent misuse, which can render a post-sale restriction unenforceable under patent law to also be unenforceable under contract law for violating public policies of the general law. However, the Supreme Court has never addressed this issue, leaving contract law and antitrust law to determine their own doctrines when appropriate controversies present themselves.[433]

D. *The Flaw in the Supreme Court's Doctrine: Patent* Rights that Run Forever with Seeds

---

for infringement or breach of contract. *B. Braun,* 124 F.3d at 1426; *Mallinckrodt,* 976 F.2d at 706.").

430. *See Mallinckrodt, Inc. v. Medipart, Inc.*, 976 F.2d 700, 704 (Fed. Cir. 1992).

431. *Motion Picture Patents Co. v. Universal Film Co.*, 243 U.S. 502, 517 (1917); *See* Herbert Hovenkamp, Mark Janis, Mark Lemley & Christopher Leslie, *IP and Antitrust: An Analysis of Antitrust Principles Applied to Intellectual Property Law*, 2010 WL 4639475 (C.C.H.) at § 3.1 (hereafter *IP and Antitrust Treatise*).

432. *Motion Picture Patents*, 243 U.S. at 519; *see also United States v. Univis Lens Co.,* 316 U.S. 241, 252-54 (1942) (The Supreme Court held a price-fixing arrangement unenforceable under patent law because of patent exhaustion was also illegal for violating antitrust law despite the use of contract restrictions that would be legal in isolation. "[T]he case is an appropriate one for the suppression of the entire licensing scheme even though some of its features, independently established, might have been used [sic] for lawful purposes.").

433. The most probable approach going forward is that 1) patent law and contract law remedies will both be available to patentees and 2) contract law will not enforce provisions that violate some other public policy, specifically the policies underlying patent law.

Bowman raised the issue of how a patented product sold by a seller not in any contractual arrangement can still have conditions attached to its use, such as no liability for using the patented seeds as food or fuel, but patent infringement for using the seeds to generate adult plants.

The Supreme Court's new inexhaustible right to exclude reproduction doctrine holds that each generation of a patented plant infringes the right to make.[434] This is regardless of any sale of the seeds that gives rise to the plant that created the planted seed or any license to grow the plant that created the planted seed. Thus, patented seeds conveyed into the stream of commerce are forever protected by patent rights such that using them to grow more than one generation is patent infringement regardless of notice to the infringer. This doctrine has three potential flaws: 1) a first-generation propagation problem, 2) a servitude problem and 3) a notice problem.

1. The First-Generation Propagation Problem: What if grain elevators had the legal right to sell seeds and convey implied license of patent rights?

The Supreme Court did not consider this issue because it held that patent infringement of the right to make occurs for patented plants regardless of any license, post-sale restriction or authorized sale. However the sale of a seed implies the right to use it for any reasonable and intended use. If a grain elevator was authorized to sell the patented seed and did so without restriction, patent rights would be exhausted. Furthermore, any sale by the grain elevator could have any reasonably intended use contemplated by the seller. Therefore, the grain elevator could convey to the purchaser an implied license to at least grow a first-generation crop, as this is a reasonable intended use.[435] However, according to the inexhaustible right to exclude reproduction doctrine, the implied license probably does not apply to subsequent generations.

2. The Servitude Problem: Downstream sales of self-replicating patented products

---

434. *Monsanto Co. v. Bowman*, 657 F.3d 1341, 1347-48 (Fed. Cir. 2011).

435. *See Bowman v. Monsanto Co.*, 133 S. Ct. 1761, 1767 n. 3 (2013), n. 3 ("the farmer might reasonably claim that the sale came with an implied license to plant and harvest one soybean crop").

During oral arguments in *Quanta*, Justice Breyer questioned the ability of a patentee to create a post-sale restriction, such as a field-of-use limitation, on its patented products that moved with the property and was enforceable using patent law. Justice Breyer described this as similar to 1) an equitable servitude on chattels or 2) a restraint on alienation that is enforceable with the full force of patent law.[436] A restriction on the right to sell or the right to use a patented plant that runs with its seeds resembles an equitable servitude.[437] A servitude is valid unless it is deemed illegal, unconstitutional or a violation of public policy.[438] Servitudes that are invalid because they violate public policy include 1) those that impose an unreasonable restraint on alienation, 2) those that impose unreasonable restraint on trade or 3) those that are unconscionable. Although the general enforceability of covenants restricting use of personal property is not questioned, the potential for enforcement under pain of patent infringement is an open question.

This patent infringement liability that runs with seeds situation is reminiscent of the Supreme Court's extreme disfavor of allowing patentees to use patent law to extract royalties on patented products after downstream sales when the purchasers were not truly aware of the situation. For example, in 1895, the Court noted that "the inconvenience and annoyance to the public are too obvious to require illustration."[439] In 1917, the Court again emphasized this general disfavor by denouncing a purported licensing scheme as abuse of patent rights to accomplish price-fixing.[440] However, in the situation of RoundUp Ready® seeds, the purchasers are generally aware of the conditions on reproduction and Monsanto is not fixing the price of commodity soybeans based on any patent right. For patented organisms, reproduction should be defined as patent infringement regardless

436. This would be a powerful servitude because patent infringement is strict liability and only requires notice to the defendant in order to receive legal remedies not equitable remedies, e.g. injunctions. There is a legal onus on purchasers to check if sellers are authorized to sell a product before purchasing it and, perhaps, if they are authorized to sell it for the usage of the product contemplated by the purchaser.

437. A restrictive covenant or negative easement is a servitude obligation that imposes a negative duty on the possessor of the property. In the example, the seed purchaser has a negative duty not to grow a second-generation seed and re-plant it or to sell the seed for the purpose of planting.

438. *IP and Antitrust Treatise*, *supra* n. 432, § 3.1.

439. *Keeler v. Standard Folding Bed Co.*, 157 U.S. 659, 667 (1895).

440. *Straus v. Victor Talking Machine Co.*, 243 U.S. 490, 500-01 (1917).

of how the product was acquired in order to promote innovation by protecting patentees' rights. Despite its resemblance to a servitude, this restriction on reproduction is not a true servitude but rather the calling into play of the patentee's right to make at the moment of reproduction of each new generation.

This servitude problem represents the one conspicuous failure of the inexhaustible right to exclude reproduction doctrine in meeting the goals of patent exhaustion; however, the existence of restrictions on personal property currently does little harm to the public. The use of genetically engineered plants in combination with chemical herbicides is probably not yet part of the "ordinary pursuits of life."[441] Commercial farmers are not purchasing or licensing patented seeds "in the ordinary channels of trade."[442] However, patented seeds/grains sold as commodities might eventually satisfy this articulation for subsequent purchasers, such as if genetically modified organism became popular for microfarming.[443] This would result in a notice problem where the danger of patent infringement to unwary purchasers planning on germinating purchased seeds because a legal liability might exist for inadvertently causing reproduction of a patented organism.

In fact, the servitude problem might benefit the public by helping to promote downstream users' awareness of biological dangers and the need for care in propagating genetically modified organism. "The practice of purchasing seeds from grain elevators for planting is fraught with risk. Widespread adoption of Mr. Bowman's license fee circumvention scheme will [] facilitate the spread of noxious weeds."[444] The unorthodox planting of mixed commodity seeds by Bowman might contribute to uncontrolled gene flow and other types of biocontamination.

Many are concerned that persistent and invasive weeds might be created if genetically modified crops transfer their transgenes via spontaneous gene flow to undomesticated, weedy

---

441. *See Quanta Comp., Inc. v. LG Elec., Inc.*, 553 U.S. 617, 625 (2008) (citing *Bloomer*, 55 U.S. at 549).

442. *See Gen. Talking Pictures v. W. Elec. Co.*, 304 U.S. 175, 181 (1938); *Id.* at 186 ("A license to sell a widely used merchantable chattel must be as to prospective purchasers if anything – a transfer of the patentee's entire right to sell; it cannot – as to noncontracting parties – restrict the use of ordinary articles of purchase bought in the open market." (Black, J., dissenting)).

443. *See* Andrew W. Torrance, *Planted Obsolescence: Synagriculture and the Law*, 48 Idaho L. Rev. 321, 346-48 (2012).

444. Brief of Am. Soybean Assn. et al. as Amici Curiae in Support of Respondent, *supra* n. 46, at 33.

relatives.[445] In addition, transgenes can flow between different transgenic crops.[446] The practice of saving seeds in heterogeneous mixtures can accelerate transgene flow.[447] Therefore, the never-ending servitude might help keep propagators aware of dangers and constrained by licensing terms.[448]

The growing of Bt-toxin expressing crops requires compliance with federal laws.[449] If a downstream user is not careful, they may not only infringe patents but also violate regulatory laws of the states, Plant Variety Protection Act and Environmental Protection Agency intended to protect human health and the environment.[450]

---

445. Plants routinely exchange genes through hybridization, which can eventually result in the introgression of transgenes into undomesticated weeds. Kwit, *supra* n. 417; Stewart, *supra* n. 411. Introgression of transgenes from crops into feral relatives is infrequent, and to date, there have only been a few cases of spontaneous transgene escape, such as EPSP transgenes from engineered creeping bentgrass spreading into feral creeping bentgrass species. Zapiola ML and Mallory-Smith CA 2012. *Crossing the divide: gene flow produces intergeneric hybrid in feral transgenic creeping bentgrass population*. Molecular Ecology 21, 4672-4680; Schafer MG, et al. 2011. *The establishment of genetically engineered canola populations in the US*. PLOS One 6: e25736; Warwick SI, et al. 2008. *Do escaped transgene persist in nature? The case of an herbicide resistance transgene in a weedy Brassica rapa population*. Molecular Ecology 17, 1387-1395; Reichman JR, et al. 2006. *Establishment of transgenic herbicide resistant creeping bent-grass (Agrostis stolonifera L.) in nonagronomic habitats*. Molecular Ecology, 15, 4243-4255; Wartrud LS, et al. 2004. *Evidence for landscape-level, pollen-mediated gene flow from genetically modified creeping bentgrass with CP4 EPSPS as a marker*. PNAS 101, 14533-14538.

446. Schafer, *supra* n. 442; Beckie HJ, et al. 2003. *Gene flow in commercial fields of herbicide-resistant canola (Brassica napus)*. Ecol Appl 13:1276–1294. Rieger MA, et al. 2002. *Pollen-mediated movement of herbicide resistance between commercial canola fields*. Science 296: 2386-2388.

447. Fiit GP, et al. 2004. *Resistance risks and management associated with Bt maize in Kenya. In: A Case Study of Bt Maize in Kenya*, Hilbeck A and Andow DA (eds.), CAB International, Wallingford, UK. Pp. 209-250.

448. Macilwain, C. 2005. *US launches probe into sales of unapproved transgenic corn*, Nature 434: 423.

449. 7 U.S.C. §§ 136-238. When pesticidal substances meeting the Federal Insecticide, Fungicide and Rodenticide Act definition of a pesticide are present through genetic engineering, then the transgene and its product, such as Bt toxin, are typically defined and regulated as plant-incorporated protectants. *See* U.S. EPA. Current and Previously Registered Section 3 PIP Registrations, Revised June 9, 2010 (http://www.epa.gov/oppbppd1/biopesticides/pips/pip_list.htm), accessed March 20, 2013.

450. Brief of Pioneer Hi-Bred Intl., Inc. as Amici Curiae in Support of Respondent at 3-11, Bowman v. Monsanto Co., 2013 WL 267023, — U.S. ___ (2013).

3. The Notice Problem: When patented, self-replicating products enter ordinary life

The inexhaustible right to exclude reproduction doctrine creates a notice problem where a concealed trap based on patent infringement liability could catch the unwary downstream-user who innocently propagates a patented plant. It has been argued that the inexhaustible right to exclude reproduction doctrine will "render 'innocent infringers' vulnerable to liability for inadvertently planting Monsanto's Roundup Ready® seeds and thereby making new infringing seeds."[451] As Justice Breyer noted in oral arguments, self-replicating items can "end up inadvertently all over the place."[452]

However, there is a human agency dimension to patent infringement. The mere blowing and germinating of seeds containing transgenes onto an unwary landowner's land would usually not be patent infringement. As Mr. Waxman, counsel for Monsanto, responded in oral arguments, "it requires affirmative volitional [sic] conduct. That is, it's not that – a thing doesn't infringe; a person infringes."[453] Fortunately, these subsequent purchasers would not be liable for damages without actual notice because second-generation commodity seeds are not marked with

---

451. Brief of Wisconsin Alumni Research Found. et al. as Amici Curiae in Support of Respondent, *supra* n. 230, at 24; *see also* Brief of Amicus Curiae Knowledge Ecology Intl. in Support of Petitioner at 10–11, Bowman v. Monsanto Co., 2013 WL 267023, — U.S. ___ (2013); Brief of Amicus Curiae Ctr. for Food Safety et al. in Support of Petitioner at 38-40, Bowman v. Monsanto Co., 2013 WL 267023, — U.S. ___ (2013). Monsanto asserted that it will not sue farmers for patent infringement whose crops were unintentionally contaminated with trace amounts of its patented products. Organic Seed Growers and Trade Assn. v. Monsanto Co., 851 F. Supp. 2d 544, 549, 552-553 (S.D.N.Y. 2012); *see* Transcript of Bowman, Oral Argument, *supra* n. 400, at *41 (J. KAGAN: "seeds can be blown onto a farmer's farm by wind, and all of a sudden you have Roundup seeds there and the person – farmer is infringing, or there's a 10-year-old who wants to do a science project of creating a soybean plant, and he goes to the supermarket and gets an edamame, and it turns out that it's Roundup seeds." MR. WAXMAN: "There would be inadvertent infringement if the farmer was cultivating a patented crop, but there would be no enforcement of that. The farmer wouldn't know, Monsanto wouldn't know, and in any event, the damages would be zero because you would ask what the reasonable royalty would be, and if the farmer doesn't want Roundup Ready technology and isn't using Roundup Ready technology to save costs and increase productivity, the – the royalty value would be zero.").

452. Transcript of Bowman, Oral Argument, *supra* n. 400, at *44.

453. *Id.*

patent numbers.[454] However, injunctions against cultivators that prevent the selling of a season's crop could result in heavy financial losses.

For example, patent infringement would not occur if a downstream user unknowingly cultivated Roundup Ready seeds without also using a glyphosate herbicide. It could be argued that the lack of any exploitation of the invention means that there is no patent infringement until the plant is "used" or "made" in a way that utilizes the patented glyphosate resistance phenotype conferred by patented DNA molecules.[455] Organic farmers should be safe from such suits; however, a commercial farmer that routinely uses glyphosates may unintentionally infringe Monsanto's patents. Furthermore, if the use of the Roundup Ready technology was accidental, say via seeds blown by the wind, pollen transfer or contaminated equipment, then it should make up a very small percentage of the crop planted.

However unlike herbicide resistance which requires the human activity of adding the herbicide to the plants to effectively practice the patent, inadvertent patent infringement would be a problem for crops genetically engineered to have general stress resistances, such as to drought or insects. This is because the patent owner can argue the cultivator gained some advantage by exploiting the invention if the crop benefited from the patented technology. Thus, some general stress resistant plants embodying patented technologies might spread via the wind or cross-pollination such that another farmer, including organic farmers, might inadvertently cultivate them. This would be patent infringement under the inexhaustible right to exclude reproduction doctrine.

The strict liability of patent infringement means that farmers may need to take potentially onerous steps to prevent themselves from committing patent infringement.[456] Fortunately, these subsequent purchasers would not be liable for damages without actual notice because second-generation commodity seeds

---

454. 35 U.S.C. § 287(a); *Monsanto Co. v. Bowman*, 657 F.3d 1341, 1348-49 (Fed. Cir. 2011); s*upra* n. 482.

455. *See Bowman*, 569 U.S. at *9-10 (The growth of patented plants was not spontaneous. Bowman "purchased beans from a grain elevator anticipating that many would be Roundup Ready" and cultivated the soybeans in the presence of glyphosate-based herbicide to exploit Monsanto's patented technology.).

456. *See, e.g.*,, Jurgens v. CBK, Ltd., 80 F.3d 1566, 1570 n.2 (Fed. Cir. 1996) (citing Hilton Davis Chem. Co. v. Warner-Jenkinson Co., 62 F.3d 1512, 1527 (Fed. Cir. 1995) (en banc), *rev'd on other grounds*, 520 U.S. 17 (1997).

are not marked with patent numbers.[457] However, a court will usually enjoin the defendant from infringing even though they were only put on notice by the service of the patent infringement complaint.[458] Injunctions against cultivators that prevent the selling of a season's crop could result in heavy financial losses.

The inexhaustible right to exclude reproduction doctrine creates patent rights that move forever with the self-replicating products and are based on how the product is used. The fear of inadvertent patent infringement might inhibit trade and add transaction costs for searching for and interpreting patent rights. Do parties purchasing seeds for the purpose of planting need to bring both 1) a DNA sequencer to test the product before buying and 2) a patent lawyer to interpret any patent(s) implicated by the results? Or should purchasers routinely request that sellers agree to contracts that contain clauses providing representations and warranty provisions guaranteeing the seller's authorization to sell seeds for planting?

Awareness is key to avoiding patent-infringement based injunctions for the unintentional act of reproducing patented organisms or practicing patented methods related to organisms. One solution to problem of patent rights running forever with certain products is to create a public database of 1) patented, self-replicating products, 2) self-replicating products containing patented technologies, such as cells or DNA molecules and 3) self-replicating products with substantially non-infringing uses that still relate to process patent claims that are sold as products in the marketplace, e.g. seeds embodying patented technology that are sold as commodities.[459] This database should serve merely a precautionary role and not have the legal effect of notice of any patent. If a cultivator inadvertently infringed a patent claim directed to 1) an organism, 2) a method of using an organism or 3) a cell within the organism, then the cultivator runs the risk of an injunction and loss of an entire crop or experimental cross. On the

---

457. 35 U.S.C. § 287(a); *Bowman*, 657 F.3d at 1348-1349; s*upra* n. 482.

458. Grain Processing Corp. v. Am. Maize-Prods. Co., 185 F.3d 1341, 1345-47 & n.3 (Fed. Cir. 1999).

459. For example, there isa free search tool for DNA-based patents called the DNA Patent Database, which contains over 63,000 DNA-based patents issued by the USPTO. http://dnapatents.georgetown.edu/, last accessed on April 26, 2013. The DNA Patent Database was developed in 2005 with the assistance of the Bioethics Research Library at Georgetown University and is financially supported by grants from National Institutes of Health and the Department of Energy.

other hand, this risk and inefficiency could be reduced by such a database.

VI. CONCLUSION

By developing a new doctrine, the Federal Circuit has offered a solution to the dilemma about how to protect the sale of patented, self-replicating products. The Supreme Court's current solution preserves patent owners' right to collect a fair reward within the scope of their patents without inflicting much violence to goals of patent exhaustion and patent misuse. The Solicitor General of the US's amicus brief defended the doctrine as a correct holding of the inapplicability of the principle of patent exhaustion to the unauthorized reproduction of a patented, self-replicating product purchased in an authorized sale because the act of growing a new generation of the patented organism constituted the "making" of a new infringing entity.[460] Patent exhaustion is inapplicable in this situation despite the conveyance of tangible property in an authorized sale.

The inexhaustible right to exclude reproduction doctrine maintains the incentive feature of the patent system specifically for self-replicating technologies. This new doctrine simply sets the confines of the patent grant to include reproduction of a patent organism as infringing upon the patentee's right to make. This technology-specific doctrine is isolated from the principle of patent exhaustion and allows the principle of patent exhaustion to be strengthened or weakened without any effect on post-sale restrictions on reproduction of patented, self-replicating products. In addition, this new doctrine prevents the implication of patent misuse based on attempts to enforce restrictions on product replication because the right to exclude reproduction is inexhaustible.

However, this new doctrine might inhibit trade and add transaction costs to purchasers of any self-replicating technology, such as organisms, viruses, transposons, ribozymes, prions or self-assembling nanotechnologies. As the sales of self-replicating products and patents related to such products increase, purchasers might feel increasingly compelled to search for patent rights before acquiring these types of products for the purpose of reproducing them because the principle of patent exhaustion does not protect them. The flaw in this new doctrine—the creation of permanent

460. Brief of the United States as Amicus Curiae in Support of Denying Certiorari, *Bowman*, 657 F.3d 1341 (Fed. Cir. 2011) at 6, 12.

patent infringement liabilities on personal property—currently results in little harm to the public, but this could change when patented, self-replicating products become part of the ordinary pursuits of life by being mass marketed and purchased in ordinary channels of trade. Although the Supreme Court might not have considered all the issues in developing this new doctrine, the judiciary must solve controversies as they present themselves and cannot wait for Congress to amend the patent statute with a sui generis rule for applying patent exhaustion to self-replicating products.[461]

461. *See Bowman v. Monsanto Co.*, 133 S. Ct. 1761, 1769 (2013) ("We recognize that such inventions are becoming ever more prevalent, complex, and diverse."); Patterson, *supra* n. 124, at 207, 224-27; Zain, *supra*, n. 166, at 116-17.