

No. 11-796

IN THE
Supreme Court of the United States

VERNON HUGH BOWMAN,

Petitioner,

v.

MONSANTO COMPANY, *et al.*,

Respondents.

**On Writ of Certiorari to the
United States Court of Appeals
for the Federal Circuit**

**BRIEF OF WASHINGTON LEGAL FOUNDATION
AS AMICUS CURIAE IN SUPPORT OF RESPONDENTS**

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QUESTION PRESENTED

Amicus curiae addresses the following question only:

Whether the first-sale doctrine grants the purchaser of a patented article the right to make, use, and sell an unlimited number of new copies of the patented invention that have never been sold.

TABLE OF CONTENTS

	Page
TABLE OF AUTHORITIES	v
INTERESTS OF <i>AMICI CURIAE</i>	1
STATEMENT OF THE CASE	2
SUMMARY OF ARGUMENT	5
ARGUMENT	8
I. THE PATENT EXHAUSTION DOCTRINE DID NOT GRANT BOWMAN, BY VIRTUE OF HIS COMMODITY SEED PURCHASES, THE RIGHT TO MAKE AN UNLIMITED NUMBER OF NEW COPIES OF THE PATENTED INVENTION	8
A. The Patent Exhaustion Doctrine Developed as a Means of Promoting Economic Efficiency, Not to Protect the Property Rights of Purchasers	9
B. The Court’s Repair/Reconstruction Case Law Supports the Decision Below	17

	Page
II. ROUNDUP READY® CROPS HAVE BEEN SHOWN TO PROVIDE NUMEROUS ENVIRONMENTAL BENEFITS	18
A. Decreased Use of More Toxic Pesticides	19
B. Transgenic Crops Have Higher Yields	22
C. Roundup Ready® Crops Have Increased Farmers' Incomes	23
CONCLUSION	24

TABLE OF AUTHORITIES

	Page(s)
Cases:	
<i>Adams v. Burke</i> ,	
84 U.S. 453 (1873)	9, 11, 12, 17
<i>Aro Mfr. Co. v. Convertible Top Replacement Co.</i> ,	
365 U.S. 336 (1961)	18
<i>Bauer & Cie v. O'Donnell</i> ,	
229 U.S. 1 (1913)	9
<i>Bloomer v. McQuewan</i> ,	
55 U.S. 539 (1853)	10, 11, 12
<i>Eli Lilly and Co. v. Sun Pharmaceutical</i>	
<i>Industries, Ltd.</i> , 611 F.3d 1381 (Fed. Cir.	
2010), <i>cert. denied</i> , 131 S. Ct. 2445 (2011)	1
<i>Jazz Photo Corp. v. Int'l Trade Comm'n</i> ,	
264 F.3d 1094 (Fed. Cir. 2001)	17
<i>Keeler v. Standard Folding Bed Co.</i> ,	
157 U.S. 659 (1895)	12, 13, 14, 15, 16, 18
<i>Mitchell v. Hawley</i> ,	
83 U.S. 544 (1873)	10
<i>Motion Picture Patents Co. v. Universal Film</i>	
<i>Mfg. Co.</i> , 243 U.S. 502 (1917)	9, 10, 15, 16
<i>Orion IP v. Honda Motor America</i> ,	
605 F.3d 967 (Fed. Cir. 2010)	1
<i>Quanta Computer, Inc. v. LG Electronics, Inc.</i> ,	
553 U.S. 617 (2008)	9
<i>Therasense Inc. v. Becton, Dickinson and Co.</i> ,	
649 F.3d 1276 (Fed. Cir. 2011)	1
 Statutes:	
35 U.S.C. § 154(a)(1)	5, 18

	Pages
Miscellaneous:	
Graham Brookes & Peter Barfoot, <i>GM Crops: The Global Economic and Environmental Impact-The First Nine Years 1996-2004</i> , 8 <i>AgBioForum</i> 2&3 (2005)	23
Economic Research Service/USDA, <i>Adoption of Bioengineered Crops</i> , ERS Agricultural Economic Report No.AER-810, at 26 (2002), available at http://www.ers.usda.gov/media/759233/aer810h_1.pdf (last visited Jan. 17, 2013)	20
EPA, <i>1996-1997 Pesticide Market Estimates</i> , available at http://www.epa.gov/opp00001/pestsales/97pestsales/overview1997.htm (last visited Jan. 17, 2013)	19
EPA, <i>2006-2007 Pesticide Market Estimates</i> , available at http://www.epa.gov/opp00001/pestsales/07pestsales/usage2007.htm#3_1 (last visited Jan. 17, 2013)	19
EPA, <i>Glyphosate</i> , R.E.D. Facts (Sept. 1993), available at http://www.epa.gov/oppsrrd1/REDs/factsheets/0178fact.pdf (last visited Jan. 17, 2013)	20
Wade A. Givens, David R. Shaw, Greg R. Kruger, et al., <i>Survey of Tillage Trends Following the Adoption of Glyphosate-Resistant Crops</i> , 23 <i>WEED TECHNOLOGY</i> (Jan.-Mar. 2009)	21

	Page(s)
Terrance M. Hurley, Paul D. Mitchell, & George B. Frisvold, <i>Effects of Weed Resistance Concerns and Resistance Management Practices on the Value of Roundup Ready Crops</i> , 12 <i>AGBIOFORUM</i> 3&4 (2010)	23
Michele C. Marra, Nicholas E. Piggott, & Gerald A. Carlson, <i>The Net Benefits, Including Convenience, of Roundup Ready Soybeans: Results From a National Survey</i> (Sept. 2004), <i>available at http://www.docstoc.com/docs/ 34733342/THE-NET-BENEFITS-INCLUDING- CONVENIENCE-OF-ROUNDUP</i> (last visited Jan. 17, 2013)	21, 23
National Research Council, <i>Impact of Genetically Engineered Crops on Farm Sustainability in the United States</i> (National Academies Press 2010)	22
Steven Sexton & David Zilberman, <i>How Agricultural Biotechnology Boosts Food Supply and Accommodates Biofuels</i> , National Bureau of Economic Research (January 2011)	22

INTERESTS OF *AMICUS CURIAE*

The Washington Legal Foundation (WLF) is a public interest law and policy center with supporters in all 50 States. WLF devotes a substantial portion of its resources to defending free enterprise, individual rights, and a limited and accountable government.¹

To that end, WLF has regularly appeared before this Court and other federal courts in cases raising important issues regarding the scope and enforceability of patents. *See, e.g., Eli Lilly and Co. v. Sun Pharmaceutical Industries, Ltd.*, 611 F.3d 1381 (Fed. Cir. 2010), *cert. denied*, 131 S. Ct. 2445 (2011) (double patenting doctrine); *Therasense Inc. v. Becton, Dickinson and Co.*, 649 F.3d 1276 (Fed. Cir. 2011) (inequitable conduct doctrine); *Orion IP v. Honda Motor America*, 605 F.3d 967 (Fed. Cir. 2010) (anticipation by prior art).

The nation's farmers have experienced tremendous advances in seed technology in recent years, thanks in large measure to major expenditures for research and development in this area by Respondent Monsanto Co. and others. WLF is concerned that the extremely broad interpretation of the patent exhaustion doctrine espoused by Petitioner would, if accepted by the Court, throw into question the nation's ability to sustain those advances. That doctrine has never previously been understood to

¹ Pursuant to Supreme Court Rule 37.6, WLF states that no counsel for a party authored this brief in whole or in part; and that no person or entity, other than WLF and its counsel, made a monetary contribution intended to fund the preparation and submission of this brief. All parties have consented to the filing of this brief; letters of consent have been lodged with the clerk.

permit purchasers of a patented product to “use” the product to create an entirely new product on the template of the original.

WLF is submitting this brief to focus on the history of the patent exhaustion doctrine and to explain why the rationale for that doctrine is inapplicable to the facts of this case. WLF does not address issues related to the “conditional sales” doctrine, a doctrine not relied on by the Federal Circuit in issuing its decision and which this Court need not address in resolving the case.

WLF is also submitting this brief to respond to allegations by Petitioner and some supporting *amici* that the technology developed by Monsanto has been bad for the environment. Those environmental arguments are not directly relevant to the Questions Presented in this case. But rather than allow these inaccurate environmental charges to color the Court’s perception of the case, WLF briefly responds to the allegations.

STATEMENT OF THE CASE

Petitioner Vernon Bowman is an Indiana farmer who since 1999 has purchased soybean seeds from a seed producer licensed by Respondents Monsanto Co., *et al.* (collectively “Monsanto”). Monsanto has developed a patented technology that enables crops grown from those seeds to tolerate glyphosate, a widely

used agricultural herbicide.² In order to purchase those seeds, Bowman was required to sign a Technology Agreement, acknowledging that Monsanto's technology was protected under U.S. patent law and agreeing not to replant harvested Roundup Ready® soybeans. Each spring, Bowman planted the licensed seeds (as the Agreement authorized him to do), and there is no evidence that he ever replanted soybeans grown from the seeds.

At issue here are soybeans grown by Bowman as a late-season "second crop." In a highly unusual procedure, Bowman obtained the seeds for his second crop by purchasing commodity seeds from a local grain elevator. Bowman suspected that many of those seeds carried the Roundup Ready® trait. His suspicion proved accurate when he applied glyphosate to the second crop and most of the soybeans survived. He saved seeds from this second-crop harvest and thereafter used the saved seeds to plant each year's second-crop soybeans.³ By then he was aware that all of these seeds carried the Roundup Ready trait, and he was thus able to apply glyphosate to each year's crop.

The result was that Bowman grew second-crop soybeans that he knew contained Monsanto's patented glyphosate-tolerant genetic trait, and he did so without

² Monsanto manufactures glyphosate under the trademark Round-Up ®. Soybeans to which the glyphosate-tolerant genetic trait has been added are known as Round-Up Ready® soybeans.

³ Bowman occasionally supplemented his second-crop seed supply by purchasing additional commodity seeds from the local grain elevator.

Monsanto's authorization and without paying a royalty. When Monsanto discovered Bowman's activity, it filed suit for patent infringement.

The trial court rejected Bowman's argument that the doctrine of patent exhaustion barred enforcement of Monsanto's patents. It granted Monsanto's motion for summary judgment, ruling that Bowman had infringed the patents.

The Federal Circuit affirmed. Pet. App. 1a-18a. The appeals court held that patent exhaustion did not bar Monsanto's infringement claim. *Id.* at 10a. It deemed irrelevant Bowman's claim that Monsanto's patent rights in the commodity seeds purchased by Bowman were exhausted. Even if that claim were accurate, the court concluded, Bowman infringed the patent by growing a new generation of Roundup Ready® soybeans without obtaining a license from Monsanto to do so. *Id.* The court explained:

The fact that the 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. The right to use does 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.

Id. (citations omitted). The appeals court said that Bowman was free to use his commodity seed as animal feed "or for any other conceivable use" other than for

the purpose of growing new Roundup Ready® soybeans. *Id.*

SUMMARY OF ARGUMENT

Federal law grants patent holders the “right to exclude others from making, using, offering for sale, or selling the invention.” 35 U.S.C. § 154(a)(1). Monsanto never authorized Bowman to “mak[e]” Roundup Ready® soybeans from the commodity seeds he purchased from the local grain elevator, but Bowman nonetheless knowingly did so. Accordingly, he infringed Monsanto’s patents, and the lower courts properly awarded damages.

Bowman contends that under the doctrine of patent exhaustion, Monsanto retained no patent rights in the commodity seed that he purchased from the grain elevator. If so, Bowman was free to use the commodity seed as he saw fit; for example, he could have used it as animal feed. But his right to use the commodity seed did not encompass the right to make a brand new soybean plant containing the glyphosate-tolerant genetic trait protected by Monsanto’s patents. Federal courts have long imposed strict limitations on the rights of the purchaser of a patented invention to use that product to make brand new copies of the invention. In the absence of such a limitation, patentees would quickly lose the ability to profit from their inventions.

The history of the patent exhaustion doctrine demonstrates that it was never intended to apply in the manner espoused by Bowman. Bowman suggests that the doctrine arose from an aversion to limitations on

private property rights, that once an individual gained title to property courts were reluctant to allow a seller – even one holding a patent on the item sold – to interfere with the buyer’s right to do as he wished with his own property. Pet. Br. 42-44. This Court’s case law suggests otherwise. The exhaustion doctrine was born of a desire to promote efficiency in economic transactions. The courts concluded that the greatest efficiency could be achieved if, in general, patentees were required to be paid their entire royalty (*i.e.*, the value added to the product by virtue of the patentee’s monopoly rights) at the time of first sale.

Any other rule would be inefficient, the courts concluded, because (among other things): (1) subsequent buyers would have difficulty knowing for certain the extent of the patentee’s continued claim to the property and thus would be less willing to purchase; and (2) the absence of a first sale rule would create uncertainty even between the contracting parties regarding the patentee’s continuing rights.

The efficiency-enhancing explanation for the patent exhaustion doctrine undercuts Bowman’s position that a purchaser’s unrestricted right to “use” his property free from patent restrictions includes the right to fashion a new patented product from the existing one. The exhaustion doctrine assumes that in an efficient market, the patentee on average will receive a fair royalty – no more and no less – each time one of his patented products is placed into the stream of commerce. That assumption cannot be squared with Bowman’s contention, because if (as he contends) the purchaser of a single Roundup Ready® soybean seed can parlay that seed into a thousand new seeds, the

commercial use of those thousand seeds will generate only one royalty for Monsanto.

Bowman objects to the Federal Circuit's reliance on case law that prohibits a purchaser from constructing essentially new items on the template of the original. Pet. Br. 38 ("Bowman's use of commodity seeds for planting has nothing in common with 'reconstruction.' No parts were worn out and replaced; the seeds were simply used."). That objection is without merit. The Court has long cautioned that the purchase of a patented product carries with it the right to use the product *only so long as it is capable of use*. Bowman's assertion that "no parts were worn out" undercuts his position. Had individual parts of his seeds been worn out, he would have been permitted to repair those parts in order to extend the useful life of the seeds. But that right to repair has never been deemed to include the right to make an entirely new product. There is no plausible argument that the second-crop glyphosate-tolerant soybeans grown by Bowman were simply repaired versions of the commodity seed that he purchased from the grain elevator.

Several of Bowman's *amici* have largely ignored patent exhaustion case law and instead have focused on alleged environmental harms that supposedly flow from use of Roundup Ready® crops. *See, e.g.*, Brief for Amici Curiae Center for Food Safety and Save Our Seed ("CFS Br.") at 2-25. Those allegations are not well-founded. Their claim that Roundup Ready® technology has led to an increase in "overall pesticide use," CFS Br. at 4, is false; pesticide usage has been declining. Many attribute the decline to the increased

use of Roundup Ready® crops, which in turn permits substitution of Roundup® for less efficient herbicides that needed to be applied in greater quantities. Use of Roundup Ready® crops is also associated with decreased soil tillage. That trend is applauded by environmentalists; tillage causes soil erosion and can endanger water quality.

Contrary to CFS's contention, transgenic crops produce higher yields than traditional crops. The higher yield derives from their glyphosate tolerance, a trait that permits better weed control and thus reduced crop damage caused by weeds. Although CFS decries increased expenditures for resisting weeds that have begun to develop resistance to glyphosate, it ignores the significant increase in net farm income associated with Roundup Ready® technology.

ARGUMENT

I. THE PATENT EXHAUSTION DOCTRINE DID NOT GRANT BOWMAN, BY VIRTUE OF HIS COMMODITY SEED PURCHASES, THE RIGHT TO MAKE AN UNLIMITED NUMBER OF NEW COPIES OF THE PATENTED INVENTION

Beginning in 1999, Bowman regularly grew soybean crops that he well knew exhibited Monsanto's patented glyphosate-tolerant genetic trait. He asserts that the patent exhaustion doctrine prevents Monsanto from charging him with infringement. That assertion misconceives the exhaustion doctrine, which grants the a purchaser of a patented product the right to use *that product* free from patent law restrictions, not an

unbounded right to make and sell new copies of the product.

Bowman contends that the commodity seed he purchased from the local grain elevator was sold to him without any of Monsanto's patent restrictions. If so, he was entitled to *use* the seed as he saw fit. But nothing in the patent exhaustion doctrine granted Bowman the right to *make* brand new Roundup Ready® soybeans.

A. The Patent Exhaustion Doctrine Developed as a Means of Promoting Economic Efficiency, Not to Protect the Property Rights of Purchasers

Understanding why the patent exhaustion doctrine does not protect a purchaser's right to "use" his purchased goods to make or grow duplicate products requires an examination of the development of that doctrine over the past 150 years.

As the Court recently explained, "The longstanding doctrine of patent exhaustion provides that the initial authorized sale of a patented item terminates all patent rights to that item." *Quanta Computer, Inc. v. LG Electronics, Inc.*, 553 U.S. 617, 625 (2008). After an authorized sale has occurred, the Court has invoked the doctrine to hold that a patentee may not rely on patent law to restrict, *inter alia*, the locations at which the patented item may be used, *Adams v. Burke*, 84 U.S. 453 (1873); the price at which it may be sold, *Bauer & Cie v. O'Donnell*, 229 U.S. 1 (1913); and the method by which it may be operated. *Motion Picture Patents Co. v. Universal Film Mfg. Co.*, 243 U.S. 502 (1917). The patentee is entitled to

negotiate a contract with the purchaser for the purpose of limiting the manner in which the purchaser may use the item, but enforcement of any such agreement must be through contract law, not patent law. *Id.* at 514. Moreover, if the purchaser resells the item, the patentee will likely be unable to enforce the contract with the new owner, with whom he lacks privity.

Bowman suggests that the patent exhaustion doctrine is a byproduct of a desire by courts to protect the property rights of the purchaser of a patented item. Pet. Br. 43 (“In essence, exhaustion arises from any lawful title transfer. . . . That title vests in someone other than the seed seller amounts to exhaustion of patent rights in progeny seeds.”); *id.* at 44 (“Farmers such as Bowman who choose to plant commodity grain for their second crop lawfully own the next-generation seeds. . . . And because title in seed that farmers grow vests with those farmers, exhaustion logically extends to those seeds as well.”). But that theory does not explain why courts permit patentees to resort to contract law for the purpose of continuing to exert dominion over patented items that they have sold. Nor does it explain why patent law permits patentees to exert dominion over a patented item that was never the subject of an authorized sale, even though title to the item is lodged firmly with the alleged infringer. *See, e.g., Mitchell v. Hawley*, 83 U.S. 544 (1873).

The exhaustion doctrine began as an effort by the courts to determine the intent of the parties to a sales contract between a patentee and the purchaser of a patented item. In *Bloomer v. McQuewan*, 55 U.S. 539 (1853), the 1833 sales contract for a planing machine did not specify what the effect on the purchaser’s rights

would be if the patent term (then scheduled to expire in 1849) were extended. Congress did, in fact, later extend the patent term by seven years, to 1856. Noting that patentees' rights under federal patent law were no greater after 1849 than they had been before 1849 with respect to sold items, the Court looked solely to contract law to determine whether the purchaser's rights to use the machine remained in force during the patent-extension period. 55 U.S. at 549-50. The Court concluded that the parties must have assumed at the time of the 1833 contract signing that the purchaser would be permitted to continue to use the machine for as long as it lasted. *Id.* at 550-51. The Court held, "[U]nder the general law [*i.e.*, the federal common law of contracts], in force when the special act of Congress was passed [in 1845], a party who had purchased the right to use a planing machine during the period to which the patent was first limited, was entitled to use it during the extension authorized by that law." *Id.* at 550.

The Court later concluded that *Bloomer v. McQuewan* had established a patent exhaustion doctrine, whereby a patented item's initial authorized sale terminates all patent rights to that item, not simply (as in *McQuewan*) an alleged patent right to rescind a previously granted license to use a patented item.⁴ Thus, in *Adams*, the Court held that a patentee could not invoke the patent law to prevent a purchaser of a patented coffin lid (who was not in privity of

⁴ The patentee in *McQuewan* had argued that the 1845 congressional statute had granted him just such a right of rescission. *Id.* at 551-54.

contract with the patentee) from using the lid wherever he chose. The Court explained:

But in the essential nature of things, when the patentee, or the person having his rights, sells a machine or instrument whose sole value is in its use, he receives the consideration for its use and he parts with the right to restrict that use. The article, in the language of the court, passes without the limit of the monopoly. 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.

84 U.S. at 456 (citing *McQuewan*).

Adams nonetheless made clear that a purchaser's right to make use of patented technology did not continue indefinitely. Rather, it continued only "so long as [the purchased machine] was capable of use." *Id.* at 455.

The Court more fully explained the rationale for the patent exhaustion rule 22 years later, in *Keeler v. Standard Folding Bed Co.*, 157 U.S. 659 (1895). In concluding that "one who buys patented articles of manufacture from one authorized to sell them becomes possessed of an absolute property in such articles, unrestricted in time or place," the Court explained that its rule was justified by a need to avoid "[t]he inconvenience and annoyance to the public that an

opposite conclusion would occasion.” *Keeler*, 157 U.S. at 666-67. The Court emphasized that its rule was *not* based on solicitude for the property rights of purchasers, noting that a patentee was free to turn to contract law if he desired to restrict the purchaser’s future use of the product being sold. *Id.* at 666.

An examination of the facts in *Keeler* illustrates the sort of “inconvenience and annoyance to the public” that the Court believed that the patent exhaustion doctrine would prevent. The plaintiff in *Keeler* held an exclusive license to sell patented bedsteads in Massachusetts. The defendants purchased identical patented bedsteads in Michigan from the Michigan licensee, then began reselling them in Massachusetts. The Court held that the patent exhaustion doctrine barred the plaintiff from using the patent laws to prevent the defendants from selling in Massachusetts, even though the defendants knew that the company from which they purchased the bedsteads was only licensed to make sales in Michigan. *Id.* To illustrate the knotty legal issues that would arise—and thereby would inhibit the free flow of commerce—if the patent law did *not* assume that a purchaser of a patented item was free to use and sell his property wherever he chose, the Court set forth a series of hypothetical cases:

Suppose, however, the patentee has exercised his statutory rights of assigning by conveying to another an exclusive right under the patent to a specified part of the United States. What are the rights of a purchaser of patented articles from the patentee himself within the territory reserved to him? Does he thereby obtain an absolute property in the article, so that he can

use and vend it in all parts of the United States, or, if he take the article into the assigned territory, must he again pay for the privilege of using and selling it? If, as is often the case, the patentee has divided the territory of the United States into 20 or more ‘specified parts,’ must a person who has bought and paid for the patented article in one part, from the vendor having an exclusive right to make and vend therein, on removing from one part of the country to another, pay to the local assignee for the privilege of using and selling his property, or else be subjected to an action for damages as a wrongdoer? And is there any solid distinction to be made, in such a case, between the right to use and the right to sell? Can the owner of the patented article hold and deal with it the same as in case of any other description of property belonging to him, and, on his death, does it pass, with the rest of his personal estate, to his legal representatives, and thus, as part of the assets to be administered, become liable to be sold?

Id. at 661-62. Having identified these “inconvenience[s] and annoyance[s] to the public” that would arise in the absence of patent exhaustion doctrine, the Court deemed the doctrine an appropriate means of avoiding them. The Court further explained that the doctrine does not unfairly penalize patentees by depriving them of royalty rights: “The conclusion reached does not deprive a patentee of his just rights, because no article can be unfettered from the claim of his monopoly without paying its tribute.” *Id.* at 666-67.

The Court provided a further explanation of the

rationale underlying the patent exhaustion doctrine in *Motion Picture Patents*. In that case, the patentee sought to invoke the patent laws to control post-sale uses of its patent motion picture projectors, even uses by purchasers with whom it was not in privity. Among other things, the patentee sought to require purchasers to display only those films produced by the patentee. It went so far as to require that all projectors display a plate (whose removal would eliminate the license to use the projector at all) explaining the full extent of the patentee's rights, including the right to impose additional license terms during the life of the patent. In affirming a decision that invoked the patent exhaustion doctrine to deny an injunction against violation of the license terms, the Court made clear that it deemed tie-in arrangements of this sort to constitute unauthorized restraints on trade. 243 U.S. at 513. The Court said that the "fair as well as the statutory measure of [the patentee] reward for his contribution to the public stock of knowledge" was the funds derived from the sale of "the right to an exclusive use of the new and useful discovery which has been made." *Id.* It viewed the tie-in arrangement as an effort by the patentee to derive an unwarranted profit from the same of items not covered by the patent. *Id.* at 515.

In further support of the patent exhaustion doctrine, the Court also repeated the inconvenience/annoyance rationale articulated in *Keeler*: "The patent law furnishes no warrant for such a practice [of using the patent law to restrict post-sale use of patented items in order to derive a monopoly profit from unpatented items], and the cost, inconvenience, and annoyance to the public which the opposite conclusion

would occasion forbid it.” *Id.* at 516.

To sum up, case law indicates that the patent exhaustion doctrine developed as a means of promoting efficiency in economic transactions and of preventing the patentee from imposing unreasonable restraints on trade as a means of deriving a profit in excess of what his invention warrants. It was never intended to protect purchasers, once they acquire title to a patented item, against all incursions on their “right” to do with as they please with their property.

Understood in that light, the patent exhaustion doctrine is inapplicable to this case. It would be applicable only if, as Bowman contends, his naked title to the commodity seeds (and to the infinite generation of soybeans seeds that might follow) were sufficient to permit him to do whatever he desires with his property. But simply because Bowman held title to the second-planting soybeans does not mean that the patent exhaustion doctrine gave him the unlimited right to make, sell, and use those soybeans. The patent exhaustion doctrine has always presupposed a “first sale” of some sort, and Monsanto never sold Bowman any rights with respect to the second-planting soybeans.

Moreover, the rationale for the patent exhaustion doctrine, as explained in *Keeler* and *Motion Picture Patents*, has no application to Bowman’s claims. Patent-related restrictions on use of property to which one holds title can cause serious “inconvenience” and “annoyance” to the public when the extent of those restrictions cannot be clearly delineated. Uncertainty may exist when the law permits such products to be

“used” for some purposes but not others. But the line being drawn here—Bowman may “use” commodity seed even though it may be Roundup Ready®, but he may not “make” new Roundup Ready® soybeans – is easily understood. Moreover, as Monsanto has demonstrated, affirming the judgment below will result in its receipt of only a single royalty for each Roundup Ready® soybean that is made/grown by farmers.

B. The Court’s Repair/Reconstruction Case Law Supports the Decision Below

In support of its decision, the Federal Circuit relied on case law that prohibits a purchaser from constructing a new patented item by using the original:

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.

Pet. App. 14a (quoting *Jazz Photo Corp. v. Int’l Trade Comm’n*, 264 F.3d 1094, 1102 (Fed. Cir. 2001)).

Bowman objects to the reliance on cases that permit the purchaser of a patented item to “repair” the item but not to “reconstruct” it. He asserts, “Bowman’s use of commodity seeds for planting has nothing in common with ‘reconstruction.’ No parts were worn out and replaced; the seeds were simply used.” Pet. App. 38a.

That objection is without merit. The Court has long cautioned that the purchase of a patented product

carries with it the right to use the product *only so long as it is capable of use*. See, e.g., *Adams*, 84 U.S. at 455; *Keeler*, 157 U.S. at 663; *Aro Mfr. Co. v. Convertible Top Replacement Co.*, 365 U.S. 336, 346 (1961).

Bowman's assertion that "no parts were worn out" undercuts his position. Had individual parts of his seeds been worn out, he would have been permitted to repair those parts in order to extend the useful life of the seeds. *Id.* But the right to repair has never been deemed to include the right to make an entirely new product. WLF recognizes that there are many close cases, where the line between repair and reconstruction is not easily drawn; but this is not a close case. There is no plausible argument that the second-crop glyphosate-tolerant soybeans grown by Bowman were simply repaired versions of the commodity seed that he purchased from the grain elevator.

Bowman's careful cultivation of second-crop soybeans constituted the "making" of a product that is protected by Monsanto's patents. In the absence of permission from Monsanto to engage in such conduct, the Federal Circuit properly concluded that Bowman violated 35 U.S.C. § 154(a)(1).

II. ROUNDUP READY® CROPS HAVE BEEN SHOWN TO PROVIDE NUMEROUS ENVIRONMENTAL BENEFITS

Several of Bowman's *amici* have largely ignored patent exhaustion case law and instead have focused on alleged environmental harms that supposedly flow from use of Roundup Ready® crops. See, e.g., Brief for

Amici Curiae Center for Food Safety and Save Our Seed (“CFS Br.) at 2-25. Those allegations are not well-founded.

By enabling farmers to use glyphosate rather than other herbicides, Roundup Ready® technology offers several economic and environmental benefits. Roundup Ready® technology has replaced more toxic pesticides, enabled farming practices that promote conservation, bolstered yield protection, and boosted farmers’ incomes. In its *amicus* brief, CFS repeatedly overstates environmental concerns, and downplays the positive effects of agricultural bioengineering. Though CFS has concerns over herbicide use and agricultural biotechnology in principle, it neglects to mention that in the absence of glyphosate and Roundup Ready® technology, farmers would be using more dangerous herbicides and more environmentally harmful farming practices.

A. Decreased Use of More Toxic Pesticides

Contrary to CFS’s allegation that Roundup Ready® technology has led to an increase in “overall pesticide use,” CFS Br. 4, EPA figures indicate that overall pesticide use declined between 1997 and 2007.⁵ A USDA attributes this decline in pesticide use to the

⁵ Compare EPA, *1996-1997 Pesticide Market Estimates*, available at <http://www.epa.gov/opp00001/pestsales/97pestsales/overview1997.htm> (last visited Jan. 17, 2013) with EPA, *2006-2007 Pesticide Market Estimates*, available at http://www.epa.gov/opp00001/pestsales/07pestsales/usage2007.htm#3_1 (last visited Jan. 17, 2013).

rise of genetically engineered soybeans.⁶ Roundup® is more effective than its predecessor herbicides, meaning that less Roundup® is required relative to other herbicides to protect one's crops from weeds. Additionally, Roundup® is non-selective, meaning it is capable of killing a wide variety of plants. As a result, it can be used in lieu of several targeted herbicides. Before use of Roundup® became an option, growers were forced to administer (and then monitor) combinations of several herbicides. The creation of Roundup Ready® seeds has allowed farmers to replace this costly, dangerous, and time-consuming practice with the use of Roundup®. EPA and USDA data, as well as Roundup®'s effectiveness and ability to control a wide spectrum of weeds, contradict CFS's claim that Roundup Ready seeds have led to greater pesticide use.

As CFS notes, use of glyphosate has increased. But given that glyphosate is considered less toxic and more environmentally friendly than other herbicides,⁷

⁶ Economic Research Service/USDA, *Adoption of Bioengineered Crops*, ERS Agricultural Economic Report No. AER-810, at 26 (2002), available at http://www.ers.usda.gov/media/759233/aer810h_1.pdf (last visited Jan. 17, 2013).

⁷ The USDA has concluded, "Glyphosate has a half-life in the environment of 47 days, compared with 60-90 days for the herbicides it commonly replaces. The herbicides that glyphosate replaces are 3.4 to 16.8 times more toxic, according to a chronic risk indicated based on the EPA reference dose for humans." Economic Research Service/USDA, at 28. The EPA has deemed glyphosate "of relatively low oral and dermal acute toxicity," and categorized the herbicide in Toxicity Category III (on a scale of I to IV, IV being the least dangerous.) It is not considered carcinogenic. EPA conducted a "worst-case scenario" study and concluded that human dietary exposure and risk are minimal. See EPA, *Glyphosate*, R.E.D. Facts

its increased use is an environmental benefit. Glyphosate breaks down rapidly in the environment, and its adsorptive nature makes it unlikely to migrate to ground water. Unlike other herbicides, glyphosate kills weeds without substantially harming exposed animals, the soil, or water quality.

Roundup Ready® crops are also associated with decreased tillage. A 2009 study showed that use of Roundup Ready® seeds led to a 23% increase in conservation tillage practices,⁸ while another confirmed that “[t]illage trips decrease, percent of soybean acres in no-till systems increase, and the value of time saved in tillage activities increases as farmers shift from traditional to [Roundup Ready®] soybeans.”⁹ Tillage causes soil erosion, requires more labor, demands higher fuel costs and energy use, and endangers water quality by increasing the risk of surface water pollution.

(Sept. 1993), available at <http://www.epa.gov/oppsrrd1/REDs/factsheets/0178fact.pdf> (last visited Jan. 17, 2013).

⁸ Wade A. Givens, David R. Shaw, Greg R. Kruger, et al., *Survey of Tillage Trends Following the Adoption of Glyphosate-Resistant Crops*, 23 WEED TECHNOLOGY at 152 Jan.-Mar. (2009).

⁹ Michele C. Marra, Nicholas E. Piggott, & Gerald A. Carlson, *The Net Benefits, Including Convenience, of Roundup Ready Soybeans: Results From a National Survey*, at 17 (Sept. 2004), available at <http://www.docstoc.com/docs/34733342/THE-NET-BENEFITS-INCLUDING-CONVENIENCE-OF-ROUNDUP> (last visited Jan. 17, 2013).

B. Transgenic Crops Have Higher Yields

Transgenic crops have higher yields than their non-genetically modified counterparts.¹⁰ CFS obscures this fact by repeatedly stating that the sole reason that genetically engineered crops have been engineered is to increase herbicide resistance. CFS Br. at 3. But seeds need not be engineered for the purpose of increasing yields to achieve the same result. Indeed, several studies point to evidence that agricultural biotechnology increases yields and, as a result, lowers food prices.¹¹ Roundup Ready® technology improves yields by reducing crops' susceptibility to herbicides, which in turn combats crop destroying weeds. Thus, the technology increases overall yields by reducing the amount of damage caused by weeds.

The purpose of the CFS's attack is to disparage the motives behind agricultural biotechnology. According to CFS, Monsanto's "favorite myth about their product is that they are needed in order to 'feed the world.'" CFS Br. at 8. But yield is not determinative of whether Roundup Ready crops have ameliorated hunger or had an effect on food supply. As a National Research Council study has recognized, "[Herbicide resistant] crops have not substantially increased yields, but their use has facilitated more

¹⁰ Steven Sexton & David Zilberman, *How Agricultural Biotechnology Boosts Food Supply and Accommodates Biofuels*, National Bureau of Economic Research at 9 (January 2011).

¹¹ *See id.*

cost-effective weed control[.]”¹² In places without such technology, costlier and more ineffective means of combating weeds prevail.

C. Roundup Ready® Crops Have Increased Farmers’ Incomes

Roundup Ready® technology has not only encouraged farmers to adopt environmentally-friendly farming practices, but also has led to increased farm income. Roundup Ready® crops have reduced production costs and enabled more efficient weeding practices.¹³ Due to glyphosate’s non-selective nature, farmers have reduced costs by ceasing to apply and monitor toxic combinations of herbicides to control different varieties of weeds. Conservation tillage techniques have further lowered production costs. While agricultural biotechnology has had a positive impact on incomes in many farming sectors, the largest gains have been seen in soybeans, where herbicide resistance generated \$4.14 billion in added income in 2004, or an additional 9.5% to the value of the crop.¹⁴

¹² National Research Council, *Impact of Genetically Engineered Crops on Farm Sustainability in the United States* 9 (National Academies Press 2010).

¹³ See Terrance M. Hurley, Paul D. Mitchell, & George B. Frisvold, *Effects of Weed Resistance Concerns and Resistance Management Practices on the Value of Roundup Ready Crops*, 12 *AGBIOFORUM* 3&4 (2010).

¹⁴ Graham Brookes & Peter Barfoot, *GM Crops: The Global Economic and Environmental Impact-The First Nine Years 1996-2004*, 8 *AgBioForum* 2&3 (2005).

CFS alleges that use of Roundup® leads to weed resistance, and weed resistance in turn leads to higher costs. But CFS ignores the significant improvements in efficiency offered by Roundup® and Roundup Ready® crops. One estimate places the savings from use of Roundup Ready® seeds—due to decreased labor and herbicide costs and reduced tillage—at up to \$37 per acre.¹⁵ Another major study confirms those savings estimates.¹⁶

CONCLUSION

Amici curiae request that the Court affirm the judgment of the court of appeals.

Respectfully submitted,

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¹⁵ Marra, *supra*, at 2.

¹⁶ See Hurley, *supra*.