

A Tale of the Apocryphal Axe: Repair, Reconstruction, and the Implied License in Intellectual Property Law

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Recommended Citation

Mark D. Janis, *A Tale of the Apocryphal Axe: Repair, Reconstruction, and the Implied License in Intellectual Property Law*, 58 Md. L. Rev. 423 (1999)

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**A TALE OF THE APOCRYPHAL AXE: REPAIR,
RECONSTRUCTION, AND THE IMPLIED LICENSE IN
INTELLECTUAL PROPERTY LAW**

MARK D. JANIS*

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[T]he apocryphal axe

[is that] of which [its] owner brags:

*"This is my great-grandfather's original axe, although
the handle has been replaced five times,
and the head twice."¹*

This Article discusses the mischief that ensues when courts must solve the riddle of the apocryphal axe in order to determine patent infringement. The stakes are enormous. Consider the owners of axe patents, who are pleased to sell axes, but would be even happier if they could control the multi-million-dollar replacement-parts market in axe handles and heads.² This control is elusive, however, because a supplier of unpatented handles or heads infringes the axe patent only if a customer uses a replacement handle or head to make a *new* axe.³

1. *FMC Corp. v. Up-Right, Inc.*, 816 F. Supp. 1455, 1464 n.15 (N.D. Cal. 1993), *aff'd*, 21 F.3d 1073 (Fed. Cir. 1994).

2. In a number of industries, the sale of replacement parts for a patented invention may account for the bulk of the revenue derived from the invention. *See, e.g.*, *Kendall Co. v. Progressive Med. Tech., Inc.*, 85 F.3d 1570, 1576 (Fed. Cir. 1996) (noting the patent holder's argument that "much of the profit arises from sale of the replaceable sleeves rather than from sale of the original device").

3. The customer would incur liability for direct infringement as a result of the unauthorized making. 35 U.S.C. § 271(a) (1994 & Supp. 1996). The supplier might be liable under an indirect infringement theory, either for intentionally inducing the customer to infringe, *id.* § 271(b), or for knowingly contributing to the customer's infringement by supplying a replacement part that is especially designed for use in a patented device and that is neither a staple article nor suitable for any substantial non-infringing use, *id.* § 271(c). In order for the supplier to be indirectly liable on either theory, however, the customer must indeed directly infringe the patent. *See Serrano v. Telular Corp.*, 111 F.3d 1578, 1583 (Fed. Cir. 1997) (finding that "[t]here can be no contributory infringement without direct infringement").

So what does it take to “make” a new axe? An axe handle breaks; a customer fits a new handle to the old head. What has occurred? Is this an extinguishment of the original, followed by incarnation of a new axe? This would be an illegal “reconstruction.” Or is this the same old axe, dressed in a new suit? This, by contrast, would be a permissible “repair.” Although this question seems better suited to some sort of mystic of machine tools than to a jurist, liability for patent infringement, with its serious financial consequences, turns on it.

The intellectual history of patent law’s repair-reconstruction dichotomy is, if not exactly rich, at least varied, and unquestionably idiosyncratic. The repair-reconstruction dichotomy has baffled and annoyed courts for decades,⁴ often driving courts to employ “loose language.”⁵ It moved Justice Black to song,⁶ and it impelled Justice Brown to render what is presumably (one hopes) the United States Supreme Court’s only considered judgment on the inherently perishable nature of toilet paper.⁷ This dichotomy originated in an extraordinary case concerning one of the most frequently litigated patents in the history of the U.S. patent system; Daniel Webster and William H. Seward, two towering figures of nineteenth century American politics, were co-counsel in this case at the very moment when their political rivalry portended the disintegration of the Union.⁸

For a scholarly analysis of the contributory infringement theory, see A. Samuel Oddi, *Contributory Infringement/Patent Misuse: Metaphysics and Metamorphosis*, 44 U. PITT. L. REV. 73, 76 (1982) (characterizing the doctrine simply as “the patent law application of the tort doctrine of imposing joint and several liability on tortfeasors acting in concert” and tracing its origin in American law to *Wallace v. Holmes*, 29 F. Cas. 74 (C.C.D. Conn. 1871) (No. 17,100)).

4. See *infra* Part I.B.

5. *F.F. Slocomb & Co. v. A.C. Layman Mach. Co.*, 227 F. 94, 97 (D. Del. 1915) (noting that such language has been used in addressing “the question whether the furnishing of particular parts of patented mechanism will amount to reconstruction and consequently an invasion of the exclusive rights of the patentee”), *aff’d*, 230 F. 1021 (3d Cir. 1916); see *Mallinckrodt, Inc. v. Medipart, Inc.*, 976 F.2d 700, 709 (Fed. Cir. 1992) (“Although the rule is straightforward its implementation is less so, for it is not always clear where the boundary lies: how much ‘repair’ is fair before the device is deemed reconstructed.”); *Standard Havens Prods., Inc. v. Gencor Indus., Inc.*, 953 F.2d 1360, 1376 (Fed. Cir. 1991) (noting that “[t]he difference between a repair and a reconstruction is a difficult question that must be resolved case by case”); *Hess-Bright Mfg. Co. v. Bearings Co. of Philadelphia*, 271 F. 350, 352 (E.D. Pa. 1921) (“The dividing line between repairs and a making over cannot be verbally located.”).

6. See *infra* note 103 and accompanying text.

7. See *Morgan Envelope Co. v. Albany Perforated Wrapping Paper Co.*, 152 U.S. 425, 436 (1894) (discussing a patent for a package of toilet paper).

8. See *Wilson v. Simpson*, 50 U.S. (9 How.) 109 (1850); *infra* Part I.B.1.

Courts long ago abandoned all efforts to cabin the repair-reconstruction dichotomy within a rigid framework of rules.⁹ Instead, they rest their decisions on “the exercise of sound common sense and an intelligent judgment.”¹⁰ This lack of a clear framework is not helpful to patent owners attempting to recoup research and development expenditures,¹¹ replacement parts suppliers endeavoring to carry on a legitimate business, or to customers, whose axe handles regularly break. It also is probably not satisfactory to judges, who routinely must confront the repair-reconstruction problem in patent cases. Indeed, the issue has recently been the subject of two key appellate decisions, both of which generated certiorari petitions.¹²

As a matter of sheer practicality and doctrinal stability, then, the repair-reconstruction problem needs closer scrutiny. Additionally, the dichotomy is of considerable theoretical and practical significance as one aspect of a larger problem in defining the extent to which the authorized sale of goods exhausts intellectual property rights in the subsequent use and resale of those goods.¹³ Exhaustion of rights is an issue of considerable theoretical importance¹⁴ with which jurists of the world’s leading courts, including the United States Supreme Court,¹⁵

9. See, e.g., *FMC Corp. v. Up-Right, Inc.*, 21 F.3d 1073, 1079 (Fed. Cir. 1994) (“It is impracticable, as well as unwise, to attempt to lay down any rule on this subject, owing to the number and infinite variety of patented inventions.” (internal quotation marks omitted) (quoting *Goodyear Shoe Mach. Co. v. Jackson*, 112 F. 146, 150 (1st Cir. 1901))); *Electric Auto-Lite Co. v. P. & D. Mfg. Co.*, 109 F.2d 566, 567 (2d Cir. 1940) (per curiam) (asserting that “in the nature of things there can be no rule as to where repair ends and reconstruction begins”).

10. *Goodyear Shoe*, 112 F. at 150.

11. See *FMC*, 21 F.3d at 1078 (noting the patent owner’s request for a clearer legal standard by which to distinguish infringement-through-reconstruction from permissible repair).

12. *Hewlett-Packard Co. v. Repeat-O-Type Stencil Mfg. Corp.*, 123 F.3d 1445 (Fed. Cir. 1997), cert. denied, 118 S. Ct. 1304 (1998); *Aktiebolag v. E.J. Co.*, 121 F.3d 669 (Fed. Cir. 1997), cert. denied, 118 S. Ct. 1337 (1998).

13. In general terms, exhaustion of intellectual property rights refers to the loss of intellectual property rights with regard to particular products, occurring when those products are the subject of an authorized sale. See *infra* Part I.A (providing an introduction to the concept of exhaustion and exploring additional definitions).

14. See generally Darren E. Donnelly, *Parallel Trade and International Harmonization of the Exhaustion of Rights Doctrine*, 13 SANTA CLARA COMPUTER & HIGH TECH. L.J. 445 (1997) (discussing the international dimension of the exhaustion of rights problem); David C.L. Perkins & Marleen Van Kerckhove, *Licensing Intellectual Property Rights in the EU: The Community Exhaustion Doctrine*, 490 PRAC. LAW INST. 419 (1997) (examining the way in which the exhaustion principle is applied in the European Union).

15. See *Quality King Distribs., Inc. v. L’Anza Research Int’l, Inc.*, 118 S. Ct. 1125, 1130-34 (1998) (holding that, under the first sale doctrine, authorized sale of copyrighted work outside the United States exhausts copyright protection within the United States, thus providing a defense against a claim of unauthorized importation).

the European Court of Justice,¹⁶ and the Supreme Court of Japan,¹⁷ have recently grappled.

This Article seeks to scrutinize the repair-reconstruction dichotomy,¹⁸ with particular attention to the following question: Should the exhaustion doctrine, the historic basis from which the "right" of permissible repair springs, continue to serve as its organizing principle? This Article argues that it should not. The exhaustion doctrine has driven courts to frame the repair-reconstruction distinction as an exercise in distinguishing permissible "using" from impermissible new "making." Although the analyses vary widely, the general approach falls under the concept of spentness: If the patented device has become "spent," then further replacement activities designed to restore the device to usefulness constitute illegal reconstruction.¹⁹

The rhetoric of "spentness," however, invites numerous calamities; the riddle of the apocryphal axe is emblematic of them. Analyses of spentness tend to be overly focused on the peculiarities of particular devices and the technical aspects of the replacement activities em-

16. Joined Cases C267 & 268/95, *Merck & Co. v. Primecrown Ltd.*, [1997] 1 C.M.L.R. 83 (1996) (holding that the first sale of patented product within the EU, even in a country where no patent protection for the product is available, exhausts patent rights throughout the EU). For recent commentary, see Paul Torremans & Irini Stamatoudi, *Merck is Back to Stay: The Court of Justice's Judgment in Merck v. Primecrown*, 9 EUR. INTELL. PROP. REV. 545, 545 (1997) (discussing cases involving patent exhaustion by virtue of marketing a product within a member state of the European community that does not grant a patent for the product at issue).

17. *BBS Kraftfahrzeug Technik AG v. Kabushiki Kaisha Racimex Japan* (Sup. Ct. 1, 1997), available at Jinzo Fujino, *Parallel Imports of Patented Goods: The Supreme Court Talks About its Legality* (visited Jan. 29, 1999) <<http://www.okuyama.com/c3v01ok.htm>> (holding that authorized sales of patented aluminum wheels in Germany exhausts patent rights in Japan, thus allowing a purchaser in Germany to export products into Japan and sell them in Japan in competition with the patent owner). This internet site provides a translation of the decision and commentary. For a discussion of lower court decisions in the *BBS* case, see Nanao Naoko et al., *Decisions on Parallel Imports of Patented Goods*, 36 IDEA 567, 572 (1996) (concluding that the High Court in *BBS* found that "parallel imports of patented goods are permitted if patent rights to the imported goods exist both in the country where they are sold for the first time and in the country into which they are imported").

18. Other commentators have taken up the topic, but only infrequently. See, e.g., Mark A. Farley, *Infringement Questions Stemming from the Repair or Reconstruction of Patented Combinations*, 68 J. PAT. & TRADEMARK OFF. SOC'Y 149 (1986); Ronald B. Hildreth, *Contributory Infringement*, 44 J. PAT. OFF. SOC'Y 512 (1962); Edmund J. Sease, *Patent Law: Repair-Reconstruction—A Review, Analysis, and Proposal*, 20 DRAKE L. REV. 85 (1970). No comprehensive recent treatment of the issue exists to my knowledge.

19. Two senses of spentness can be discerned from the cases. The first, described in the accompanying text, might be termed "overall spentness." Yet the cases also refer to the spentness of individual components of the combination. Used in this fashion, spentness cuts in the other direction. Subsequent replacement of a spent component might well constitute permissible repair. See *infra* Part I.B.2 for a fuller discussion.

ployed.²⁰ Such analyses are particularly troubling because they mask, and sometimes even ignore altogether, the reasonable expectations of the patentee and purchaser, respectively.

This Article argues that courts should turn away from an exhaustion of rights model for analyzing the repair-reconstruction dichotomy, and instead embrace an implied license model. A purchaser of patented goods may be said to take an implied license to use and resell the goods, but not to remake them. Framed this way, the repair-reconstruction inquiry becomes an inquiry into the scope of the implied license. At first glance, this formulation may seem interchangeable with the exhaustion principle, and United States courts have routinely jumped from one formulation to the other in considering the repair-reconstruction problem.²¹ This Article argues, however, that the implications of the implied license analysis have not been appreciated. In particular, this Article maintains that courts following an implied license model for repair-reconstruction should look first, and predominantly, to evidence of the reasonable expectations of the patentee and the purchaser concerning use and maintenance of the patented device. Courts should, in addition, be free to consult all evidence from which expectations might be inferred, including evidence of commercial custom in the industry. Evidence of “spentness” of the patented device would be relevant in such a regime, but only to the extent that it would illuminate the parties’ probable expectations.

Part I considers the dichotomy’s origins in the exhaustion principle and its confused evolution in leading Supreme Court decisions. Part II addresses the failings of “spentness,” still the dominant rhetoric by which courts attempt to analyze infringement claims involving repair and reconstruction. Part III briefly comments on the uncertain role of patentees’ and purchasers’ expectations under the exhaustion model. Part IV considers the potential for reconceptualizing the repair-reconstruction dichotomy as an exercise in defining the scope of an implied license. The point here is to consider whether analyses of the scope of an implied license employed in other contexts can be used to illuminate the repair-reconstruction dichotomy. This Part looks to decisions in three areas: intellectual property generally, real property, and contracts. Finally, Part V argues that the adoption of an implied license model would reshape repair-reconstruction doctrine in a number of significant ways.

20. See *infra* Part III.

21. See *infra* Part I.B.

I. THE EXHAUSTION OF RIGHTS AND THE REPAIR-RECONSTRUCTION PROBLEM

The origins of the exhaustion principle in United States Supreme Court jurisprudence, and the origins of its progeny—the repair-reconstruction dichotomy—can be traced to litigation over a single, extraordinary patent.²² In America's "Wooden Age,"²³ the cutting edge technology, to be quite literal, consisted of sawmills and planing machines.²⁴ William Woodworth's planing machine, which dominated the marketplace,²⁵ featured rotary cutting cylinders that were eventually adapted for a variety of operations, but were particularly effective in cutting boards for floorboards.²⁶

William Woodworth managed to secure patent protection covering the planing machine,²⁷ and he (and, later, his heirs and their successors) set about enforcing it with considerable vigor.²⁸ Woodworth apparently granted some one thousand licenses under the patent.²⁹ Litigation concerning the patent resulted in more than a dozen Supreme Court cases,³⁰ and countless cases in the lower courts.³¹ Per-

22. See Nathan Rosenberg, *America's Rise to Woodworking Leadership*, in *AMERICA'S WOODEN AGE: ASPECTS OF ITS EARLY TECHNOLOGY* 37, 48 (Brooke Hindle ed., 1975) (referring to the "tortuous history of litigation" of the planing machine invented by William Woodworth).

23. For references to the term, see Brooke Hindle, *Introduction: The Span of the Wooden Age*, in *AMERICA'S WOODEN AGE*, *supra* note 22, at 3, 3 (noting that the "Wooden Age" extended at least into the mid-nineteenth century); William C. Lipke, *Introduction to TOOLS & TECHNOLOGIES: AMERICA'S WOODEN AGE I*, 1 (Paul B. Kebabian & William C. Lipke eds., 1979) (discussing an exhibit exemplifying "America's early dependence on wood"). The label, I am convinced, pertains to the dominance of wood as an industrial resource and is not meant to be a wry social or cultural commentary.

24. See Rosenberg, *supra* note 22, at 48 (noting that "[p]laning machines were second only to saws in a ranking of woodworking machines by their relative importance").

25. *Id.*

26. *Id.* at 48-49.

27. See *id.* at 48 (noting that the patent was issued on December 27, 1828).

28. See *id.* ("The many attempts to invent around this 'notorious monopoly,' as it was frequently called, led to numerous suits for patent infringement.")

29. See PAUL B. KEBABIAN & DUDLEY WITNEY, *AMERICAN WOODWORKING TOOLS* 196 (1978).

30. See *Bloomer v. Millinger*, 68 U.S. (1 Wall.) 340, 351-52 (1863) (stating that "if a person legally acquires a title to that which is the subject of letters patent, he may continue to use it until it is worn out, or he may repair it or improve upon it as he pleases"); *Dean v. Mason*, 61 U.S. (20 How.) 198, 202 (1857) (reviewing a claim of a violation of "a territorial right to the exclusive use of the Woodworth patent for planing boards"); *Brown v. Shannon*, 61 U.S. (20 How.) 55, 56 (1857) (dismissing for lack of jurisdiction a claim for the specific execution of contracts regarding the assignment of the exclusive use of the Woodworth planing machine in Maryland); *Livingston v. Woodworth*, 56 U.S. (15 How.) 546, 553 (1853) (reviewing "an injunction to restrain [Livingston] from using or vending one or more planing machines substantially the same in construction and mode of operation as the machine which had been patented to William Woodworth"); *Brooks v. Fiske*, 56 U.S.

haps understandably, the industry reportedly came to refer to the

(15 How.) 212, 222 (1853) (holding that a planing machine known as the Norcross machine did not infringe the Woodworth patent); *Bloomer v. McQuewan*, 55 U.S. (14 How.) 539, 546 (1852) (affirming the circuit court's dismissal of a bill seeking an injunction "restraining [McQuewan] from the use of two of Woodworth's planing machines in the city of Pittsburgh"); *Wilson v. Barnum*, 49 U.S. (8 How.) 258, 261 (1850) (remanding due to a lack of jurisdiction a bill requesting "an injunction against the defendant to restrain him from using a certain machine, in which, . . . boards were planed, tongued, and grooved in the same manner as in the Woodworth machine"); *Wilson v. Sandford*, 51 U.S. (10 How.) 99, 101 (1850) (dismissing for lack of jurisdiction a claim to rescind a contract which granted Sandford "permission to use, or vend to others to be used, one of Woodworth's planing machines"); *Wilson v. Simpson*, 50 U.S. (9 How.) 109, 126 (1850) (holding that the defendants did not violate the rights of the holder of the patent by replacing the cutterknives in their machines); *Barnard v. Gibson*, 48 U.S. (7 How.) 650, 656 (1849) (dismissing on procedural grounds a "claim [of] conflicting interests as assignees of Woodworth's patented planing-machine"); *Woodworth v. Wilson*, 45 U.S. (4 How.) 712, 716 (1846) (issuing an injunction to enjoin the defendant's erection and operation of a machine that was substantially like the Woodworth machine); *Wilson v. Turner*, 45 U.S. (4 How.) 712, 712 (1846) (affirming the circuit court's dismissal of a suit involving the assignment and use of the Woodworth patent); *Simpson v. Wilson*, 45 U.S. (4 How.) 709, 710 (1846) (reviewing a claim in equity for infringement of the plaintiff's rights under an assignment of the Woodworth patent); *Wilson v. Rousseau*, 45 U.S. (4 How.) 646, 687-88 (1846) (considering the effect of the Patent Act of 1836 on assignments, extensions, and amendments to the Woodworth patent).

31. References to many of these cases can be found in an editor's note made in *Bicknell v. Todd*, 3 F. Cas. 334, 336 (C.C.D. Ohio 1851) (No. 1389). See *id.* (citing *Bloomer v. Gilpin*, 3 F. Cas. 726 (C.C.S.D. Ohio 1859) (No. 1558); *Pitts v. Edmonds*, 19 F. Cas. 751 (C.C.E.D. Mich. 1857) (No. 11,191); *Jenkins v. Greenwald*, 13 F. Cas. 519 (C.C.S.D. Ohio 1857) (No. 7270); *Foss v. Herbert*, 9 F. Cas. 503 (C.C.N.D. Ill. 1856) (No. 4957); *Ritter v. Serrell*, 20 F. Cas. 843 (C.C.S.D.N.Y. 1852) (No. 11,866); *Sloat v. Patton*, 22 F. Cas. 327 (C.C.E.D. Pa. 1852) (No. 12,947); *Brooks v. Norcross*, 4 F. Cas. 294 (C.C.D. Mass. 1851) (No. 1957); *Gibson v. Van Dresar*, 10 F. Cas. 329 (C.C.N.D.N.Y. 1850) (No. 5402); *Gibson v. Cook*, 10 F. Cas. 314 (C.C.N.D.N.Y. 1850) (No. 5393); *Gibson v. Gifford*, 10 F. Cas. 317 (C.C.N.D.N.Y. 1850) (No. 5395); *Wilson v. Sherman*, 30 F. Cas. 215 (C.C.N.D.N.Y. 1850) (No. 17,833); *Woodworth v. Cook*, 30 F. Cas. 561 (C.C.N.D.N.Y. 1850) (No. 18,011); *Bloomer v. Stolley*, 3 F. Cas. 729 (C.C.D. Ohio 1850) (No. 1559); *Motte v. Bennett*, 17 F. Cas. 909 (C.C.D.S.C. 1849) (No. 9884); *Olcott v. Hawkins*, 18 F. Cas. 639 (D.C. Wis. 1849) (No. 10,480); *Gibson v. Barnard*, 10 F. Cas. 307 (C.C.N.D.N.Y. 1848) (No. 5389); *Van Hook v. Pendleton*, 28 F. Cas. 998 (C.C.S.D.N.Y. 1848) (No. 16,852); *Woodworth v. Curtis*, 30 F. Cas. 565 (C.C.D. Mass. 1847) (No. 18,013); *Woodworth v. Edwards*, 30 F. Cas. 567 (C.C.D. Me. 1847) (No. 18,014); *Wilson v. Stolley*, 30 F. Cas. 226 (C.C.D. Ohio 1847) (No. 17,839); *Woodworth v. Hall*, 30 F. Cas. 572 (C.C.D. Mass. 1846) (No. 18,016); *Gibson v. Betts*, 10 F. Cas. 309 (C.C.N.D.N.Y. 1846) (No. 5390); *Gibson v. Harris*, 10 F. Cas. 318 (C.C.N.D.N.Y. 1846) (No. 5396); *Woodworth v. Weed*, 30 F. Cas. 595 (C.C.N.D.N.Y. 1846) (No. 18,022); *Woodworth v. Stone*, 30 F. Cas. 593 (C.C.D. Mass. 1845) (No. 18,021); *Wilson v. Turner*, 30 F. Cas. 233 (C.C.D. Md. 1845) (No. 17,845); *Brooks v. Stolley*, 4 F. Cas. 302 (C.C.D. Ohio 1845) (No. 1962); *Woodworth v. Sherman*, 30 F. Cas. 586 (C.C.D. Mass. 1844) (No. 18,019); *Washburn v. Gould*, 29 F. Cas. 313 (C.C.D. Mass. 1844) (No. 17,214); *Brooks v. Jenkins*, 4 F. Cas. 275 (C.C.D. Ohio 1844) (No. 1953); *Lippincott v. Kelly*, 15 F. Cas. 571 (C.C.W.D. Pa. 1844) (No. 8381); *Brooks v. Bicknell*, 4 F. Cas. 247 (C.C.D. Ohio 1843) (No. 1944)).

Woodworth patent as that “notorious monopoly.”³² With hundreds, possibly thousands, of Woodworth planing machines in use around the country, the extent to which the patentee could limit use after an authorized sale became a matter of considerable economic significance. Eventually, the Supreme Court was forced to confront the notions of exhaustion and permissible repair.³³

A. *Exhaustion of Intellectual Property Rights*

Litigation over the Woodworth planing machine set the stage for the introduction of the exhaustion of rights principle in the Court’s jurisprudence.³⁴ In *Wilson v. Rousseau*,³⁵ the exhaustion issue arose as a by-product of William W. Woodworth’s successful effort to secure an extension of the term of the Woodworth patent.³⁶ A few weeks before the patent was due to expire in December 1842, Woodworth successfully petitioned a board comprised of the Patent Commissioner and the Secretaries of State and the Treasury under an extension provision in the 1836 Patent Act to grant an extension of seven years.³⁷ Daniel Webster, the renowned lawyer, congressman, and presidential

32. See Rosenberg, *supra* note 22, at 48; see also KEBABIAN & WITNEY, *supra* note 29, at 196 (relating that even the editor of the Official Gazette of the Patent Office referred to the Woodworth patent as an “odious monopoly”).

33. See *infra* Parts I.A-B.

34. The exhaustion principle does appear in at least one earlier case in the lower courts. See *Boyd v. Brown*, 3 F. Cas. 1095 (C.C.D. Ohio 1843) (No. 1747). *Boyd* was a nineteenth century predecessor to current international transboundary exhaustion cases. The plaintiff had certain rights concerning the manufacture and sale of patented bedsteads, but the rights were limited geographically to Hamilton County, Ohio. *Id.* The defendant had similar rights under the patent, but the rights were limited to Indiana. *Id.* It appeared that some purchasers from the defendant in Indiana had resold their products in Hamilton County. *Id.* at 1096. The court held for the defendant, articulating a theory of exhaustion without citing any authority. *Id.* (“[T]he bedstead, which is the product, so soon as it is sold, mingles with the common mass of property, and is only subject to the general laws of property.”).

35. 45 U.S. (4 How.) 646 (1846).

36. *Id.* at 687. The inventor, William Woodworth, died in 1839, and William W. Woodworth, in his capacity as the administrator of the inventor’s estate, attempted to secure the extension of the patent. *Id.* at 658-59.

37. *Id.* The Act provided for a seven-year extension if the board determined that the patentee had failed to obtain, through no fault of his own, sufficient remuneration for the development costs of the patent. See *id.* at 658 (quoting Act of July 4, 1836, Ch. 357, 5 Stat. 117, § 18 (repealed 1870)). The board granted Woodworth’s petition after an evidentiary hearing in November 1842. *Id.* at 659.

aspirant,³⁸ was then serving as Secretary of State, and signed the order granting Woodworth's petition.³⁹

Four years later, Daniel Webster represented James G. Wilson (the new owner of the Woodworth patent)⁴⁰ before the Supreme Court in Wilson's suit to determine the legal effect of the extension.⁴¹ Webster's co-counsel was William Henry Seward, former governor of New York, future senator and Secretary of State, and an accomplished lawyer in his own right.⁴² The issue before the Court was whether licensees for the original term continued to enjoy the right to use the Woodworth planing machine under the extended term.⁴³ Although the Court devoted the bulk of its opinion to a tortured construction of a clause in the statute's extension provision,⁴⁴ glimmers of the exhaustion doctrine can be detected. First, the Court addressed the difficulties that would arise if users of patented goods, purchased from authorized sources, could freely be divested of their uses under the extension provision of the 1836 Patent Act:

By the report of the Commissioner of Patents it appears, that five hundred and two patents were issued in the year 1844 . . . and embrace articles to be found in common use in every

38. For information on Daniel Webster, see MAURICE G. BAXTER, *DANIEL WEBSTER & THE SUPREME COURT* (1966) (discussing Webster's preeminence as a Supreme Court lawyer); ROBERT V. REMINI, *DANIEL WEBSTER: THE MAN AND HIS TIME* (1997) (addressing Webster's life and career).

39. *Rousseau*, 45 U.S. (4 How.) at 659.

40. *Id.* at 661 (noting that Woodworth assigned his patent rights in some states to Wilson in 1843).

41. *Id.* at 673.

42. *Id.* Seward served as governor in Albany from 1839-42, and would, in succeeding years, go on to serve as Abraham Lincoln's Secretary of State. He would survive a vicious stabbing attack on the night of Lincoln's assassination, and, continuing as Secretary of State under Andrew Johnson, would brilliantly negotiate the purchase of Alaska from Russia. See generally GLYNDON G. VAN DEUSEN, *WILLIAM HENRY SEWARD* (1967). For a highly imaginative and entertaining portrayal of Seward as historical figure, see WALTER A. McDOUGALL, *LET THE SEA MAKE A NOISE . . .* 197, 299-304, 317 (1993).

Webster and Seward's paths had crossed previously in the political arena. While both seeking influence in the Whig party, Seward and Webster had quarreled with one another when Seward was Governor of New York and Webster was Secretary of State in the Tyler administration. See VAN DEUSEN, *supra*, at 77-78 (describing a trial in the New York courts of a Canadian sheriff who had been attempting to prevent delivery of guns from New York to rebels in Canada).

43. *Rousseau*, 45 U.S. (4 How.) at 675.

44. The following language created the difficulty:

[T]hereupon the said patent shall have the same effect in law as though it had been originally granted for the term of twenty-one years. And the benefit of such renewal shall extend to assignees and grantees of the right to use the thing patented, to the extent of their respective interest therein.

Id. at 658 (quoting Act of July 4, 1836, Ch. 357, 5 Stat. 117, § 18 (repealed 1870)).

department of labor or art, on the farm, in the workshop, and factory. These articles have been purchased from the patentee, and have gone into common use. But, if the construction against which we have been contending should prevail, the moment the patent of either article is renewed, the common use is arrested, by the exclusive grant to the patentee. It is true the owner may repurchase the right to use, and doubtless would be compelled from necessity; but he is left to the discretion or caprice of the patentee. A construction leading to such consequences, and fraught with such un-mixed evil, we must be satisfied, was never contemplated by Congress. . . .⁴⁵

This reasoning set the stage for the Court in a later case to put forward a rationale for the exhaustion doctrine based on the consideration that the purchaser paid to the patentee for the patented goods.⁴⁶

Second, the Court seemed to frame its analysis in terms of a distinction that would emerge as crucial in developing the exhaustion doctrine: exclusive rights of “making” as opposed to exclusive rights of “using.” The central concept was that the patentee, upon sale of the patented goods, lost the right to control use exclusively, but maintained the exclusive right to make the claimed invention: “[W]hen in connection with the simple right to use, the exclusive right to make and vend being in another, the right to use the thing patented necessarily results in a right to use the machine, and nothing more.”⁴⁷ Webster and Seward would rely on this distinction later in laying the foundational arguments for the repair-reconstruction distinction.⁴⁸

The exhaustion principle is only barely recognizable in *Wilson v. Rousseau*, but it sufficed as a starting point for later refinements. One such refinement grew out of another case involving the Woodworth patent, *Bloomer v. McQuewan*.⁴⁹ The Woodworth patent term had again been extended for seven years, this time by special legislation passed by Congress in 1845.⁵⁰ Bloomer, a successor in interest to the ownership of the Woodworth patent, asserted the patent against parties who had constructed planing machines during the original patent

45. *Id.* at 684.

46. *See infra* note 60 and accompanying text.

47. *Rousseau*, 45 U.S. (4 How.) at 683.

48. *See infra* Part I.B.

49. 55 U.S. (14 How.) 539 (1852). Webster died before this case was argued, and there is nothing to indicate that Seward was involved in the case.

50. *Id.* at 547.

term and who now sought to continue using them during the newly-extended period.⁵¹

The legal issue in *Bloomer v. McQuewan* differed from that in *Wilson v. Rousseau* because, unlike the general provision in the 1836 Act, Congress's special 1845 legislation contained no language directed to the rights of those who had constructed machines with the patent owner's authorization during the original term.⁵² Nevertheless, the Court concluded that the policy interests at stake in *McQuewan* were identical to those in *Rousseau*, and again decided that the defendants, having purchased the right to use the planing machine during the original term of the patent, were entitled to continue its use during the extended term.⁵³

This time, however, the Court expressly set forth a general rule of exhaustion of rights:

[W]hen the 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. . . . The implement or machine becomes his private, individual property, not protected by the laws of the United States, but by the laws of the State in which it is situated. Contracts in relation to it are regulated by the laws of the State, and are subject to State jurisdiction.⁵⁴

The concept of a patented device "passing outside" the limits of the patent right upon sale is important. It serves as a reminder that the exhaustion doctrine straddles the fence between the legal regimes of intellectual and tangible property, hinting, perhaps, that property concepts extrinsic to patent law may be analytically important within it.⁵⁵ In addition, this concept seems to imply that the purchaser of patented goods receives an "absolute" personal property right in those

51. *Id.*

52. *Id.* at 541-42.

53. *Id.* at 550. The Court also reinforced the *Wilson v. Rousseau* distinction between "the right to make and vend the machine, and the grant of the right to use it." *Id.* at 548.

54. *Id.* at 549.

55. See *Keeler v. Standard Folding Bed Co.*, 157 U.S. 659, 666 (1895) (reviewing the evolution of the patent exhaustion principle and concluding that the cases establish "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"); *Chaffee v. Boston Belting Co.*, 63 U.S. (22 How.) 217, 223 (1859) ("By a valid sale and purchase, the patented machine becomes the private individual property of the purchaser, and is no longer protected by the laws of the United States, but by the laws of the State in which it is situated."); *Incandescent Gas Light Co. v. Cantelo*, [1895] 12 R.P.D. & T.M. 262, 264 (1895) (concluding that once the proper sale of a patented item occurs, the seller cannot belatedly place conditions upon the use of the item).

goods. Consistent with the general antipathy towards restraints on alienation, especially of chattels, such a right includes not only use, but also resale.⁵⁶ The exhaustion doctrine, defined according to these basic parameters, rapidly became established in patent cases in the Supreme Court as well as lower courts.⁵⁷ The Court also seemed to signal that the exhaustion principle would be applied broadly in favor of purchasers.⁵⁸ Other cases brought to light the international dimension of the exhaustion problem, arising when a patentee made

56. See *Goodyear v. Beverly Rubber Co.*, 10 F. Cas. 638, 641 (C.C.D. Mass. 1859) (No. 5557) (noting that, upon a valid sale of a patented article, it becomes the private property of the purchaser).

57. The *Goodyear* court stated that, from the rule that a patented article becomes private property upon sale:

[I]t follows that, if a purchaser acquires an absolute, unconditional title to that which is the subject of a patent, he may continue to use it until it is worn out, or he may repair it or improve upon it as he pleases, in the same manner as if dealing with any other kind of property.

Id.; see also *Aiken v. Manchester Print Works*, 1 F. Cas. 245, 247 (C.C.D.N.H. 1865) (No. 113) (asserting that “[r]epeated decisions” of the Supreme Court have set forth the exhaustion doctrine “until it cannot any longer be regarded as an open question”).

The exhaustion principle is also the subject of some British cases from the same general time period. See, e.g., *Betts v. Willmott*, 6 Ch. App. 239, 245 (1871) (stating that when someone buys a patented article, “he expects to have the control of it, and there must be some clear and explicit agreement to the contrary to justify the vendor in saying that he has not given the purchaser his license to sell the article, or to use it wherever he pleases as against himself”). For a more recent discussion of the principle enunciated in these cases, see *Interstate Parcel Express Co. v. Time-Life International* (Netherlands) BV (1977) 15 A.L.R. 353, 359 (Austl.) (“[A] patentee is granted exclusive power to ‘make, use, exercise and vend’ the invention. The sale of a patented article, by the patentee, would be quite futile, from the point of view of the buyer, if the buyer was not entitled . . . to re-sell the article which he had bought.”).

Professor Adelman has sought to define the concept of exhaustion more precisely than does this Article. Under Professor Adelman’s definition, exhaustion is strictly defined as a rule that operates independently of the intent of the parties. See Martin J. Adelman, *The Exhaustion Doctrine in American Patent Law*, PROCEEDINGS OF THE SIXTH ANNUAL FORDMAN UNIVERSITY CONFERENCE ON INTERNAL INTELLECTUAL PROPERTY LAW AND POLICY, PROGRAM VB (Apr. 16-17, 1998) (on file with author). Under this definition, a case such as *Betts v. Willmott* is better characterized as an implied contract case in which exhaustion operates as a default rule. What is important for purposes of the present Article is that exhaustion models, however defined, are always characterized either by the subjugation (or, under Professor Adelman’s definition, the elimination) of the expectations of the parties from the analysis.

58. See *Adams v. Burke*, 84 U.S. (17 Wall.) 453, 456-57 (1873) (holding that an authorized sale by the patentee’s assignee within his specified geographic territory carried with it the right to use the patented goods anywhere); see also *Hobbie v. Jennison*, 149 U.S. 355 (1893) (rejecting the argument that *Adams* did not apply where the seller knew that the purchased goods would be used outside the seller’s territory and suggesting that the patentee could readily protect itself through express restrictions in a formal, written agreement).

authorized sales in one country to a purchaser, who in turn exported the goods into another country in competition with the purchaser.⁵⁹

The Court also made explicit the consideration rationale for patent exhaustion: when the purchaser paid the patentee for the patented goods, the purchase price was presumed to include fees for use and resale.⁶⁰ Thus, upon sale, the patentee received adequate consideration for the rights in using and selling.⁶¹ This is the prevailing rule today.⁶²

B. The Repair-Reconstruction Problem: Origins, Evolution, Confusion

Two United States Supreme Court cases have principally shaped the law of the repair-reconstruction problem. These cases seem to employ exhaustion as the organizing principle for permissible repair, and clearly establish repair-reconstruction as the operative distinction. They also hint, however, at the inadequacy of the exhaustion model to support a coherent vision of permissible repair. In particular, while these cases raise the possibility that a multiplicity of factors could bear on the repair-reconstruction dichotomy, they fail to explain both the basis of these factors, as well as which of them is important, leaving courts without much guidance in analyzing the repair-reconstruction issue.

59. See *Boesch v. Graff*, 133 U.S. 697, 703 (1890) (asserting that the right to make and sell a patented product under the laws of one country meant that "purchasers from [the patentee] could not be thereby authorized to sell the articles in the United States in defiance of the rights of patentees under a United States patent").

60. See *Mitchell v. Hawley*, 83 U.S. (26 Wall.) 544, 547 (1872) (stating that when a patentee unconditionally sells a patented item, "and the consideration has been paid to him for the thing patented, the rule is well established that the patentee must be understood to have parted to that extent with all his exclusive right, and that he ceases to have any interest whatever in the patented machine so sold").

61. See *id.*; see also *United States v. Univis Lens Co.*, 316 U.S. 241, 252 (1942) (stating that, after the first sale of a patented good, the patentee "has received in the purchase price every benefit of that monopoly which the patent law secures to him"); *Adams*, 84 U.S. (17 Wall.) at 456 (stating that, when the patentee or his assignee receives upon sale "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").

62. There are, to be sure, continuing controversies, especially concerning the impact of express restrictions against reuse on the exhaustion doctrine. For a controversial decision on the issue, see *Mallinckrodt, Inc. v. Medipart, Inc.*, 976 F.2d 700, 709 (Fed. Cir. 1992), in which the court determined that "the district court erred in holding that the restriction on reuse was, as a matter of law, unenforceable under the patent law." A full discussion of this important issue is outside the scope of this Article.

1. *The Ambivalence of Wilson v. Simpson*.—The case of *Wilson v. Simpson*⁶³ once again brought the Woodworth patent before the Supreme Court, this time under extraordinary circumstances.⁶⁴ In the tumultuous opening weeks of 1850, the country was confronting problems far more ominous and intractable than those posed by monopolies, even notorious ones. Amidst serious threats of Southern secession,⁶⁵ the Senate clashed over Henry Clay's compromise proposal.⁶⁶ On March 7, before a packed Senate chamber, Senator Daniel Webster, by now a legendary elder statesman, spoke "not as a Massachusetts man, nor as a Northern man, but as an American," counseling for compromise, even on slavery, and warning against impending war.⁶⁷

Four days later, William H. Seward, a recently elected senator from New York, counterattacked.⁶⁸ Invoking "a higher law than the Constitution," he denounced Webster's notion of compromise on the slavery question.⁶⁹

Yet the preservation of the American republic was one thing, and the practice of law quite another. While upstairs, in the Senate chamber, Seward and Webster's political rivalry became emblematic of a national crisis that would eventually precipitate civil war, downstairs, in the Supreme Court chambers, Seward and Webster had cases to argue. Four years earlier, they had appeared as co-counsel in *Wilson v. Rousseau*, and, in January Term 1850, in the midst of the Senate battle, they collaborated again on behalf of the owner of the Woodworth patent.⁷⁰ Although they lost the case, Seward and Webster crafted arguments that still dominate the current discourse over the repair-reconstruction problem.⁷¹

63. 50 U.S. (9 How.) 109 (1850).

64. See REMINI, *supra* note 38, at 678-79 (discussing the political tension in 1850 between North and South over the spread of slavery in the territories).

65. The clash of political wills in the Senate presaged a clash of a different dimension altogether. In one well-known episode, Henry Foote, senator from Mississippi, drew a pistol in a heated debate with Thomas Hart Benton, senator from Missouri. *Id.* at 679.

66. *Id.* at 663-65.

67. *Id.* at 669.

68. *Id.* at 678.

69. VAN DEUSEN, *supra* note 42, at 123.

70. Then, as now, patent litigation was a lucrative endeavor, and it seems safe to assume that the promise of generous fees induced Webster and Seward to set aside their ideological clash to take on the joint representation. See *id.* at 98 (providing an account of Seward's role in the Woodworth patent litigation).

71. See, e.g., *Aktiebolag v. E.J. Co.*, 121 F.3d 669, 673-74 (Fed. Cir. 1997) (citing *Wilson v. Simpson*, 50 U.S. (9 How.) 109 (1850)), *cert. denied*, 118 S. Ct. 1337 (1998).

The case that brought Webster and Seward to the Court in the January Term, 1850, also arose from the continued use of a Woodworth planing machine beyond the original term by a party whose use had been licensed during the original term.⁷² Webster and Seward admitted that under *Wilson v. Rousseau's* basic principle of exhaustion, the authorized purchase of a machine during the original term of the patent conferred the right to continue to use the machine during the extended term. They argued, however, that this right of use in the invention was not general, but was "strictly limited to a right to the continued use of the specific machine or machines legally in use at the time of the renewal."⁷³ Moreover, *Wilson v. Rousseau* had specifically excluded such purchasers from enjoying the right to make.⁷⁴ Accordingly, if the tangible machine ceased to exist, the purchaser's right to use would cease with it.⁷⁵ Further use by the purchaser would be possible only after a remaking of the machine, which would constitute infringement.⁷⁶

Consequently, the most important part of the argument, as Webster and Seward explained it, was to determine when the patented planing machine ceased to exist.⁷⁷ As might be expected, Webster and Seward had a ready answer: the patented planing machine was comprised of a combination of elements, so that "when any one of these elements is either worn out by use, or otherwise destroyed, then the combination invented—the thing patented—no longer exists, and cannot be restored without the exercise of the right to make."⁷⁸ Because the evidence showed that the cutter-knives of the planing machine wore out after two to three months,⁷⁹ it followed that use beyond that time would amount to an improper new making of the patented invention.⁸⁰

The Court incorporated Webster and Seward's argument into its opinion in large part, accepting the argument and disagreeing only as to its application to the facts.⁸¹ To begin with, the Court accepted the argument that it was dealing with a limitation on the principle of ex-

72. *Simpson*, 50 U.S. (9 How.) at 110-11.

73. *Id.* at 112-13.

74. *Id.* at 112.

75. *Id.* at 115.

76. *Id.*

77. *Id.*

78. *Id.* at 116.

79. *Id.* at 111.

80. *Id.*

81. *Id.* at 122.

haustion.⁸² Accordingly, it started its analysis by reaffirming the basic rule on exhaustion as established in *Wilson v. Rousseau*: “[W]hen the material of the combination ceases to exist, in whatever way that may occur, the right to renew it depends upon the right to make the invention. If the right to make does not exist, there is no right to rebuild the combination.”⁸³ The Court then fashioned the limitation argued for by Webster and Seward, distinguishing between “restoration” and “reconstruction”:

But it does not follow, when one of the elements of the combination has become so much worn as to be inoperative, or has been broken, that the machine no longer exists, for restoration to its original use, by the owner who has bought its use. When the wearing or injury is partial, then repair is restoration, and not reconstruction.⁸⁴

This basic distinction became the foundation for jurisprudence in the United States and abroad⁸⁵ for dealing with the extent of the right of

82. *Id.*

83. *Id.* at 123.

84. *Id.*

85. The earliest reported British case on the repair-reconstruction distinction appears to be *Dunlop Pneumatic Tyre Co. v. Neal*, [1899] 16 R.P.D. & T.M. 247, 250 (1899) (“Any simple repairs, I think, may be done by a person without any license from the manufacturer, but when he takes the whole thing and sells what is a new tyre with merely the old wires in it, in my opinion there has been no license to use those old wires . . . for the purpose of putting them into and making up precisely the same combination which is the subject of the Letters Patent.”). See also *Sirdar Rubber Co. v. Wallington, Weston & Co.*, [1905] 1 Ch. 451, 454 (1905) (concluding that the defendant’s replacement activity “is not a repair amounting to reconstruction, and a new article, but a fair repair”); *Dunlop Pneumatic Tyre Co. v. Holborn Tyre Co.*, [1901] 18 R.P.D. & T.M. 222, 226 (1901) (addressing whether repairs to tires constituted repair or reconstruction).

For more recent statements of the rule, see *Dellareed Ltd. v. Delkim Developments*, [1988] F.S.R. 329, 344-46 (1987) (summarizing the early cases as establishing the rule that “in respect of repairing a patented article, the implied license is restricted to what ‘may fairly be termed a repair’; it does not extend to making a new article ‘under cover of repair’”); *British Leyland Motor Corp. v. Armstrong Patents Co.*, [1986] R.P.C. 279, 358 (H.L. 1986) (“In the field of repair it is clear that a person who acquires a patented article has an implied license to keep it in repair, but must stop short of renewal.”). See generally DAVID YOUNG ET AL., *TERRELL ON THE LAW OF PATENTS* § 6.62 (14th ed. 1994) (citing British cases on the distinction between repairing and making).

For a Canadian case on repair-reconstruction, see *Rucker Co. v. Gavel’s Vulcanizing Ltd.*, 7 C.P.R. (3d) 294 (1985). For authorities from German, French, and Dutch courts, see Friedrich-Karl Beier, *Protection for Spare Parts in the Proposals for a European Design Law*, 25 INT’L REV. INDUS. PROP. & COPYRIGHT 840, 859 & n.54 (1994) (citing authorities that establish that the repair of patented articles is permissible where replacement parts are not independently protected, and the replacement activity “does not amount to re-manufacturing the entire patented product, but remains within the framework of normal measures to preserve, service and repair the product”).

use enjoyed by the purchaser of authorized patented goods.⁸⁶ In applying the test, however, the *Simpson* Court found that the defendant's replacement of knives on the planing machine constituted permissible repair, and thus affirmed the dismissal of the patentee's complaint.⁸⁷

The result may seem entirely inoffensive on an intuitive level, and no doubt the case would be decided the same way today, even after 150 years of judicial gloss. Yet the Court's opinion in *Simpson* is, if not totally incomprehensible, at least murky.

First, the Court's articulation of the "foundation of the right to repair and replace"⁸⁸ leaves a great deal to be desired. The Court resorted to vague notions of equity and harm:

Has the patentee a more equitable right to force the disuse of the machine entirely; on account of the inoperativeness of a part of it, than the purchaser has to repair, who has, in the whole of it, a right of use? And what harm is done to the patentee in the use of his right of invention, when the repair and replacement of a partial injury are confined to the machine which the purchaser has bought?⁸⁹

The Court did not make clear whether these concerns are merely a restatement of the basic consideration rationale for the exhaustion doctrine, or, by contrast, a new supplementary equitable principle devoted uniquely to the permissible repair aspect of exhaustion. Courts have never squarely addressed this question as to the foundational premise for the repair-reconstruction dichotomy.

Second, in its application of the repair-reconstruction standard, the Court set the stage for decades of confusion by presenting a wandering, unfocused analysis in which nearly anything seemed to have potential relevance to the repair-reconstruction question. In one part of the opinion, for example, the Court seemed to favor an "identity of the machine" standard, under which a replacement activity that altered the identity of the machine triggered the patentee's right to an additional royalty.⁹⁰

86. See, e.g., *Sirdar Rubber*, 1 Ch. at 454 (noting that a purchaser must be able to repair the patented good in order to "obtain the use of [it] for the fair period of its life").

87. *Simpson*, 50 U.S. (9 How.) at 126.

88. *Id.* at 123.

89. *Id.*

90. See *id.* at 125 (asserting that replacement of a worn out component of a patented machine would constitute repair when limited to that which was "absolutely necessary to identify the machine with what it was in the beginning of its use, or before that part of it had been worn out").

In other parts of the opinion, however, the expected useful life of the replaced component (i.e., whether or not it was a “temporary” part) seemed the dominant factor: If the replaced component was a temporary one anyway, then the replacement activity could be deemed repair.⁹¹ Similarly, the Court seemed to differentiate between replacement of a worn part, which would be considered an instance of repair, and replacement of a broken or useless part, which tended to suggest reconstruction.⁹² The Supreme Court in *Aro I*⁹³ later seized upon this distinction.⁹⁴

In still other portions of its opinion, the *Simpson* Court considered whether the repair-reconstruction dichotomy could be analyzed by reference to the importance (or “essentialness”) of the replaced component.⁹⁵ Here, the Court conveyed a mixed message. On the one hand, the Court observed that if a replaced component “is a part of an original combination, essential to its use, then the right to repair and replace recurs.”⁹⁶ On the other hand, the Court seemed to declare the essentialness of the component to be irrelevant, stating that there was no reconstruction if the defendant could replace the cutter-knives from time to time “though they are an essential and distinct constituent of the principle or combination of the invention.”⁹⁷

Finally, even as the Court explained the repair-reconstruction problem in terms of the physical qualities of the overall device and its

91. Importantly, the Court was not interested in the perishability of the replaced component absolutely, but instead its perishability relative to the useful life of the overall machine. *See id.* (noting that “[t]he right . . . to replace the cutter-knives is not because they are of perishable materials, but because the inventor of the machine has so arranged them as a part of its combination, that the machine could not be continued in use without a succession of knives at short intervals”). The machine at issue was designed to last for several years, while the cutting-knives would wear out and require replacement every sixty to ninety days. *Id.* at 111.

92. The Court spoke in the quaint language of nineteenth century technology:
Between repairing and replacing there is a difference.

Form may be given to a piece of any material—wood, metal, or glass It would be the right of the purchaser to repair such a thing as that, so as to give to it what was its first shape, if it had been turned from it, or, by filing, grinding, or cutting, to keep it up to the performance of its original use. But if, as a whole, it should happen to be broken, so that its parts could not be readjusted, or so much worn out as to be useless, then a purchaser cannot make or replace it by another, but he must buy a new one. The doing of either would be entire reconstruction.

Id. at 124.

93. *Aro Mfg. Co. v. Convertible Top Replacement Co.*, 365 U.S. 336 (1961) (*Aro I*).

94. *See infra* Part I.B.2.

95. *Simpson*, 50 U.S. (9 How.) at 124.

96. *Id.*

97. *Id.* at 125.

components,⁹⁸ it afforded some role to expectations, *both* those of the inventor and, it would seem, of the purchaser of the patented product.⁹⁹ For example, in connection with its discussion of the useful life of the replaced component as compared to the useful life of the machine, the Court spoke of the right to replace a component “which is liable to be often worn out or to become inoperative for its *intended* effect, which *the inventor contemplated* would have to be frequently replaced anew, during the time that the machine, as a whole, might last.”¹⁰⁰ The Court also showed that the contrast between these “temporary” parts that were subject to permissible replacement, and permanent parts that were not, could also be framed in terms of intent:

[Some components] are *contemplated by the inventor* to last so long as the materials of which they are formed can hold together in use in such a combination. . . . With such *intentions*, they are put into the structure. *So it is understood by a purchaser . . .*¹⁰¹

This passage raises important issues. Even a relatively confined reading of the passage suggests that there is a nexus between the rhetoric of spentness and the rhetoric of intent: The physical qualities of the replaced components might be analyzed because they serve as a useful proxy for the patentee’s intent. This in turn suggests that the patentee’s intent has a greater role in the repair-reconstruction analysis than is evident from other parts of the *Simpson* opinion.

Construed more broadly, the passage opens the door to considerations that are potentially separate from the rhetoric of spentness. The patentee’s, and perhaps the purchaser’s, intents and expectations might be evidenced directly, or by circumstantial evidence quite apart from the physical qualities of the device at issue. But the Court in *Simpson* was silent on the question of whether such evidence could be considered. This has left unclear what role the inventor’s and purchaser’s expectations should play in the analysis, if any.

To summarize, *Simpson* left open a number of questions. Most broadly, is permissible repair a direct application of the principle of exhaustion, or a special case involving additional equitable considerations? More narrowly, is permissible repair to be analyzed by way of a loose, multiple-factor approach in which all factors receive equal

98. This Article will refer to this mode of analysis as the rhetoric of “spentness.” See *infra* Part II.

99. *Simpson*, 50 U.S. (9 How.) at 126. For additional analysis of the role of intent in the repair-reconstruction inquiry, see *infra* Part III.

100. *Simpson*, 50 U.S. (9 How.) at 125 (emphasis added).

101. *Id.* at 126 (emphasis added).

weight, or by way of a more structured standard? If the latter, is the standard to be defined in terms of spentness, in terms of the parties' expectations, or in terms of something different entirely?

2. A "Pandora's Flock" and Two Contradictory Notions of Spentness: *The Aro I Case*.—Just over a hundred years after *Wilson v. Simpson*, the Supreme Court delivered another major decision on the repair-reconstruction problem.¹⁰² In *Aro Manufacturing (Aro I)*, the Court dealt with claims covering a folding top for a convertible automobile that consisted of "a flexible top fabric, supporting structures, and a mechanism for sealing the fabric against the side of the automobile body in order to keep out the rain."¹⁰³ Defendants manufactured and sold

102. *Aro Mfg. Co. v. Convertible Top Replacement Co.*, 365 U.S. 336 (1961). The *Aro I* decision generated a flurry of commentary, some of which approved of the Court's opinion. See, e.g., James C. Bageman, Note, *Contributory Infringement and the "Repair" Doctrine*, 38 S. CAL. L. REV. 363, 371 (1965) (approving of *Aro I* as providing a "clearer, more well-defined standard"); Thomas F. Caffrey, Case Note, 7 VILL. L. REV. 149, 152 (1961) (approving of *Aro I* as lending greater certainty to the repair-reconstruction problem); Comment, 36 N.Y.U. L. REV. 1395, 1400 (1961) (approving of *Aro I* as striking the proper balance of interests between the patentee and the supplier of unpatented components); Stuart Lubitz, Case Note, 29 GEO. WASH. L. REV. 952, 955-56 (1961) (approving of *Aro I*'s shift away from an intent-based rationale and concluding that *Aro I* is a proper extension of *Wilson v. Simpson*); Irwin M. Stein, Note, *Repair and Reconstruction in Patented Combinations*, 23 U. PITT. L. REV. 184, 197 (1961) (arguing that *Aro I* is a justifiable extension of *Wilson v. Simpson*).

In contrast, a great deal of the literature criticized the Court's opinion. See, e.g., Michael Conner, Editorial Note, *Contributory Infringement: The Aro Manufacturing Case*, 31 U. CIN. L. REV. 61, 70 (1962) (arguing that Justice Brennan's concurring opinion represents the correct approach to repair-reconstruction and asserting that *Aro I* virtually eliminates the contributory infringement remedy); Melvin F. Jager, Recent Decision, 1961 U. ILL. L.F. 343, 350 (1961) (arguing that *Aro I* severely undercuts the contributory infringement remedy); Note, 30 FORDHAM L. REV. 373, 376 (1961) (arguing that courts following *Aro I* will give "short shrift to claims of reconstruction"); Julius A. Shafran, Note, 49 CAL. L. REV. 988, 992 (1961) (same). Other commentary discussed the future implications of the case. See, e.g., Sease, *supra* note 18, at 85 (arguing against the broad sweep of the *Aro I* decision and proposing specific standards for certain sets of cases); Donald H. Ray, Note, 40 TEX. L. REV. 728, 732 (1962) (discussing the limitation of the contributory infringement remedy); *The Supreme Court, 1960 Term*, 75 HARV. L. REV. 40, 243 (1961) (discussing whether *Aro I* abandoned the contributory infringement rationale).

103. *Aro I*, 365 U.S. at 337. Justice Black, wondering how the invention could have been the result "of anything more than the simplest childlike mechanical skill," *id.* at 351 (Black, J., concurring), was moved to song: "[T]he patentee must have known all about the old-fashioned surrey with the fringe on top and with isinglass curtains you could roll right down in case of a change in the weather." *Id.* As another example of prior art, Justice Black referred to the "tops of Model T Fords which began to scare horses on country roads nearly half a century ago." *Id.* Although patentability over the prior art was not at issue, hostility towards the validity of the grant of the patent may have played a part in the Court's noninfringement determination.

replacement fabrics that had been cut to fit into the patented combination.¹⁰⁴

The Court concluded that replacement of the fabric constituted permissible repair¹⁰⁵ in an opinion whose reasoning was endorsed by only four justices.¹⁰⁶ Justice Black filed a strongly worded concurrence,¹⁰⁷ and Justice Brennan filed an equally strong opinion concurring only in the result.¹⁰⁸ Justice Harlan, joined by Justices Frankfurter and Stewart, dissented.¹⁰⁹

Two broad aspects of these confused and confusing opinions merit close scrutiny. First, the Court's opinion expressly proscribed the use of a multifactor approach to repair-reconstruction, resorting instead to a unitary "spentness" standard.¹¹⁰ Second, the Court's "spentness" standard allowed for two entirely contradictory interpretations, and the Court's opinion did not make clear which one was correct.¹¹¹

a. Aro I's Rejection of a Multifactor Approach to Repair-Reconstruction.—The *Wilson v. Simpson* opinion can rightly be criticized for its meandering rhetoric, and the Court in *Aro I* could have taken the opportunity to make a clear break from it. Instead, the Court tried to have it both ways. In some passages, the Court's opinion purported to endorse *Wilson v. Simpson* as the authoritative exposition of the repair-reconstruction doctrine.¹¹² In other passages, however, the Court's opinion repudiated the multifactor approach to repair-reconstruction, asserting inaccurately that such an approach had appeared only in lower court opinions.¹¹³

In particular, the Court's opinion chided the *Aro I* appellate tribunal for focusing attention "on operative facts not properly determinative of the question of permissible repair *versus* forbidden reconstruction."¹¹⁴ Such forbidden operative facts included, for example, whether the fabric was "a minor or relatively inexpensive com-

104. *Aro I*, 365 U.S. at 338.

105. *Id.* at 346.

106. *Id.* at 337.

107. *Id.* at 346 (Black, J., concurring).

108. *Id.* at 362 (Brennan, J., concurring).

109. *Id.* at 369 (Harlan, J., dissenting).

110. See *infra* notes 112-124 and accompanying text.

111. See *infra* notes 125-130 and accompanying text.

112. *Aro I*, 365 U.S. at 342, 343 n.9.

113. *Id.* at 345 (admitting that "there is language in some lower court opinions indicating that 'repair' or 'reconstruction' depends on a number of factors" but claiming that Supreme Court opinions had avoided that approach).

114. *Id.* at 343.

ponent,"¹¹⁵ and whether the fabric would be expected to have a particularly short useful life.¹¹⁶ Justice Black's concurring opinion was even more strident, criticizing the appellate court for using a "Pandora's flock of insignificant standards" instead of the "simple test of 'making,'" for analyzing the repair-reconstruction problem.¹¹⁷

Yet the *Simpson* opinion clearly discussed multiple factors on the way to its repair-reconstruction conclusion, including some of the very factors that the *Aro I* Court's opinion disparaged.¹¹⁸ The *Aro I* opinion, accordingly, has left courts to sort out the dilemma under which *Simpson* must be treated as authoritative, but *Simpson's* multifactor approach must be avoided.

Many courts have resolved the dilemma by default, upon discovering that thoughtful analysis of the repair-reconstruction problem inevitably required a return to at least some form of a multiple-factor approach. For example, in *Fromberg, Inc. v. Thornhill*,¹¹⁹ the Fifth Circuit cited *Aro I's* reduction of the multifactor approach to a "simpler" inquiry,¹²⁰ but then proceeded to invoke what appeared to be a multifactor test:

[I]t does not take long to recognize that such simplicity is beguiling, and in the process of a judicial determination [of

115. *Id.* (quoting *Aro Mfg. Co. v. Convertible Top Replacement Co.*, 270 F.2d 200, 205 (1st Cir. 1959)).

116. *Id.* at 343-44.

117. *Id.* at 355 (Black, J., concurring).

118. See *supra* text accompanying notes 90-101. Justice Brennan's concurring opinion in *Aro I* correctly characterized *Wilson v. Simpson* as articulating a multiple factor analysis. *Aro I*, 365 U.S. at 363-64 (Brennan, J., concurring). According to Justice Brennan, the appropriate factors include:

the life of the part replaced in relation to the useful life of the whole combination, the importance of the replaced element to the inventive concept, the cost of the component relative to the cost of the combination, the common sense understanding and intention of the patent owner and the buyer of the combination as to its perishable components, whether the purchased component replaces a worn-out part or is bought for some other purpose, and other pertinent factors.

Id. at 363-64 (footnotes omitted).

119. 315 F.2d 407 (5th Cir. 1963). See *infra* text accompanying notes 383-396 for a more detailed discussion of the Fifth Circuit's *Fromberg* decision and the Ninth Circuit's contrary approach taken in a related case.

120. *Fromberg, Inc.*, 315 F.2d at 412. The court stated:

Where once the ultimate question seems to have been fractured into a series of subsidiary inquiries as to the length of life, cost, etc. of the replaced element of a combination patent in relation to other elements or the completed device as a whole, it has now been reduced to the simpler one: does this really *make* a new device?

Id. (citing *Aro I*, 365 U.S. at 336).

repair versus reconstruction] a number of factors must be considered.¹²¹

Courts continue to pay lip service to *Aro I*'s proscription against the multiple-factor approach, yet they still apply it to one degree or another. This is particularly evident in the Federal Circuit's most recent decisions on the issue. For example, in *Aktiebolag v. E.J. Co.*,¹²² the court acknowledged *Aro I*'s rejection of certain classical factors as relevant to the repair-reconstruction distinction,¹²³ but then proceeded unabashedly to declare that "a number of factors" are relevant to this distinction.¹²⁴ *Aro I* has thus made more difficult an already complicated inquiry.

b. Aro I's "Spentness" Standard.—Having discarded the multifactor approach by means of a questionable analysis of precedent, the *Aro I* Court sought to impose a unitary spentness standard for repair-reconstruction.¹²⁵ In searching for a "plain and practical" test to stand in the stead of the multifactor standard, the Court adopted an offhand comment by Judge Learned Hand from a lengthy antitrust opinion as the "distilled essence" of the permissible repair doctrine: "The [patent] monopolist cannot prevent those to whom he sells from . . . reconditioning articles worn by use, unless they in fact make a new article."¹²⁶ This observation, of course, is nothing but a restatement of the exhaustion principle, unaccompanied by any thoughtful analysis as to whether exhaustion is an appropriate organizing principle for repair-reconstruction. This is *Aro I*'s crucial omission.¹²⁷

121. *Id.* A district court more recently expressed a similar sentiment:

[H]ow can one determine whether the article as a whole has been spent, if not by reference to whether some proportion of its individual parts are in fact worn or broken? In practice, an article becomes ripe for discarding or replacement for one of two reasons: Either it will have enough worn or broken parts that it is no longer economically rational to repair it, or it will have become obsolete due to advances in the art.

FMC Corp. v. Up-Right, Inc., 816 F. Supp. 1455, 1462 (N.D. Cal. 1993), *aff'd*, 21 F.3d 1073 (Fed. Cir. 1994).

122. 121 F.3d 669 (Fed. Cir. 1997), *cert. denied*, 118 S. Ct. 1337 (1998).

123. *See id.* at 673 (noting *Aro I*'s rejection of component inventiveness as a factor in repair-reconstruction analysis); *infra* Part II.B (discussing component importance and inventiveness as a repair-reconstruction factor).

124. *Aktiebolag*, 121 F.3d at 673.

125. *Aro I*, 365 U.S. at 343-46. The reference to a "unitary" standard here means something other than a multifactor standard, reflecting the Court's insistence on avoiding the multifactor approach.

126. *Id.* at 343 (ellipsis and alteration in original) (quoting *United States v. Aluminum Co. of Am.*, 148 F.2d 416, 425 (2d Cir. 1945)).

127. *See infra* Parts IV-V (analyzing this issue).

Another critical problem with the *Aro I* opinion is its choice of the spentness rhetoric as the repair-reconstruction standard.¹²⁸ The exhaustion model encourages courts to think about the repair-reconstruction problem in terms of spentness. Distinguishing making from using seems to call for close attention to the physical qualities of the device and, perhaps, the physical nature of the replacement activities being performed on the device. Spentness is a very natural rubric here, and the *Aro I* opinion resorted to it in formulating a holding:

The decisions of this Court require the conclusion that reconstruction of a patented entity, comprised of unpatented elements, is limited to such a true reconstruction of the entity as to "in fact make a new article," *after the entity, viewed as a whole, has become spent*. In order to call the monopoly, conferred by the patent grant, into play for a second time, it must, indeed, be a second creation of the patented entity Mere replacement of individual unpatented parts, one at a time, whether of the same part repeatedly or different parts successively, is no more than the lawful right of the owner to repair his property.¹²⁹

On its face, the inquiry into the spentness of the article may appear to be appealing, but the Court left almost no guidelines by which lower courts could implement this inquiry. The *Aro I* opinion provides a perplexing mix of messages regarding traditional indicia of spentness, such as machine identity, component importance, component perishability and useful life, and dominance of new over old components. Courts are thus left to seek guidance from the myriad cases before and after *Aro I* that have explored these aspects of spentness.

Another major problem with *Aro I* concerns the Court's contradictory uses of the spentness rubric. Under one notion of spentness, which would seem to be supported by the passage quoted above, the fact of device spentness presages impermissible reconstruction. That is, the notion is one of overall spentness. Patentees would presumably argue, for example, that the failure of a component of a patented device rendered the device itself spent, and efforts to replace that component would be impermissible attempts to reconstruct the spent device.

One could also speak, however, of the spentness of an individual component. The *Aro I* opinion refers to spentness in this fashion as well, but without explanation: "We hold that maintenance of the 'use

128. *Aro I*, 365 U.S. at 346.

129. *Id.* (citation omitted) (emphasis added).

of the whole' of the patented combination through replacement of a spent, unpatented element does not constitute reconstruction."¹³⁰ Used in this way, spentness cuts in the opposite direction: defendants would argue that a replaced component was spent, and that its replacement constitutes mere permissible repair of the patented device.

In sum, *Aro I* installed spentness as the standard for repair-reconstruction, but failed to provide reasonable guidance for analyzing spentness, and failed to specify whether spentness referred to the whole device or to a part of it. More fundamentally, the Court, again perhaps unwittingly, adopted an exhaustion model without considering its limitations, or what alternative models might have had to offer.

II. THE HEART, THE SOUL, AND THE PARTS OF THE WHOLE: THE FAILURE OF SPENTNESS AS A STANDARD FOR REPAIR-RECONSTRUCTION

If spentness is the operative standard after *Aro I* for analyzing the repair-reconstruction problem, how can one evaluate whether a patented device has indeed become spent? Case law before and after *Aro I* reveals a dizzying array of potential approaches. While some are more satisfactory than others, they share a common weakness because they force attention towards the peculiarities of the patented device and away from the circumstances surrounding the sales transaction between the patentee and the purchaser. In particular, spentness analyses overemphasize the importance of the physical qualities of patented devices and fail to recognize that the physical qualities should merely function as a proxy for the reasonable expectations of the parties. Ultimately, long experience with the spentness standard highlights the limitations inherent in it and undercuts the proposition that exhaustion is a satisfactory model by which to resolve repair-reconstruction disputes.

A. *The Soul of the Invention: The Metaphysics of Machine Identity*

One approach to assessing spentness is to consider whether, in the course of a series of replacement activities, the patented device at issue has undergone a change in identity. At the point at which the original device becomes transformed, through replacement activities, to a new device, the original device is deemed spent and the replacement activities responsible for the transformation, and certainly any future additional replacement activities, would amount to impermissible reconstruction.

130. *Id.*

It would be difficult to imagine a more intractable legal standard. Nevertheless, there is ample precedential support for the "identity of the machine" test. *Wilson v. Simpson* includes language that can be taken as an expression of this test.¹³¹

The identity of the machine standard also shows up in quite a number of pre-*Aro I* cases,¹³² but, it seems, to very little ultimate effect. In some cases the standard seems to have been merely recited by rote.¹³³ In other cases, the court proceeded only marginally further in attempting to apply the standard, usually injecting it as a conclusory label in the analysis. For example, in *Gottfried v. Conrad Seipp Brewing Co.*,¹³⁴ the court stated that the defendant had the right to replace parts that wore out, as often as necessary, "so long as the identity of the machine is retained."¹³⁵ The court's analysis amounts to little more than a declaration that "[t]he proof in this case shows, to my satisfaction, that as the grates, pipes, and blowers were worn out, they were renewed, and therefore the identity of the machine is re-

131. See *Wilson v. Simpson*, 50 U.S. (9 How.) 109, 126 (1850) (noting that the "replacement of temporary parts does not alter the identity of the machine, but preserves it, though there may not be in it every part of its original material"). In this regard, the *Aro I* case contains mischaracterizations of *Simpson*. See *Aro I*, 365 U.S. at 352-53 (Black, J., concurring) (arguing that the *Simpson* Court rejected the "conceptualistic and misleading argument" that "the machine ceased to exist or have any 'material existence' the moment its knives wore out, . . . [so that] replacement of the knives amounted to a[n] [impermissible] 'making,'" in favor of a "common-sense rule"). Despite Justice Black's characterization, the *Simpson* Court, and several after it, did adopt the "conceptualistic" "identity of the machine" standard. See, e.g., *Ideal Wrapping Mach. Co. v. George Close Co.*, 23 F.2d 848, 850 (D. Mass. 1928) (noting that although "[d]ifficulties arise in determining the legal limits between repair and reconstruction[,] . . . [t]he test is whether the identity of the machine is preserved by the repairs"), *aff'd*, 29 F.2d 533 (1st Cir. 1928). For an early British case to the same effect, see *Dunlop Pneumatic Tyre Co. v. Holborn Tyre Co.*, [1901] 18 R.P.D. & T.M. 222, 226 (1901) (implying an identity of the machine test by asking "[i]s [the item] substantially, in common parlance, honestly, a new article, or is it an old article repaired?").

132. See *infra* notes 133, 134 and 137. It appears that a number of treatises of the time had also picked up on the "identity of the machine" standard. See *Miller Hatcheries, Inc. v. Buckeye Incubator Co.*, 41 F.2d 619, 621 (8th Cir. 1930) (citing treatises).

133. For cases mentioning the standard in passing, see *Morrin v. Robert White Engineering Works*, 143 F. 519, 520 (2d Cir. 1905); *Ideal Wrapping*, 23 F.2d at 850; *C. & R. Research Corp. v. Write, Inc.*, 19 F.2d 380, 381 (D. Del. 1927); *Young v. Foerster*, 37 F. 203, 204 (C.C.S.D.N.Y. 1889); *Singer Manufacturing Co. v. Springfield Foundry Co.*, 34 F. 393, 395 (C.C.D. Mass. 1888).

134. 8 F. 322 (C.C.N.D. Ill. 1881).

135. *Id.* at 323.

tained."¹³⁶ Similar conclusory assessments of machine identity can be found in a number of cases.¹³⁷

Several reasons might explain why the identity of the machine standard has proven to be such a dismal failure. First, it seems at best highly unlikely that courts could ever reliably formulate an "identity" of a machine, much less assess whether that identity had "changed." Second, and more importantly, the identity standard, as applied in many cases, will call for the court to confront the riddle of the apocryphal axe. This means that the court will have to determine whether "identity" of a machine is something definable only with regard to certain components, certain groups of components, or separately from the components altogether.

The British court in *Dunlop Pneumatic Tyre Co. v. Holborn Tyre Co.*¹³⁸ offers a simple illustration of the identity standard that betrays its difficulties:

Take the case of an ordinary farm cart. A man has at the beginning a new cart. By-and-bye the wheels, one or both of them, have worn out, and he puts on a pair of new wheels. Is it or is it not the old cart? Few people would doubt that it is the old cart. . . . But by-and-bye the shafts fail, and for the old shafts are substituted new ones. I do not wish to express a decided opinion, but it is quite possible you have still the old cart. But if after that you come to the body of the cart, and the body of the cart is either taken away and a new body is put there, or new wood is put for a large portion of the cart, surely it is impossible to then say that the old cart still remains.¹³⁹

The court's hesitation as it proceeds through the sequence of replacements is significant. Is there something inherent about the wood of the cart's body that makes it uniquely an identifier of farm carts, so that whenever the body is replaced, a new cart is constructed? Or does the significance really lie in the sequence of replacements, so

136. *Id.*

137. *See, e.g.,* Morgan Gardner Elec. Co. v. Buettner & Shelburne Mach. Co., 203 F. 490, 493 (7th Cir. 1913) (concluding that "[t]o replace the hollow washer and other separate parts of the protective device did not destroy the identity of the patented device").

Many of these cases also followed *Simpson's* lead in treating the identity of the machine standard as one consideration among other indicia of repair, rather than as an overarching standard. *See, e.g.,* Wagner Typewriter Co. v. F.S. Webster Co., 144 F. 405, 416 (C.C.S.D.N.Y. 1906) (delineating a number of factors that the court should consider in rendering its determination, in addition to whether an item "is easily removable and replaced without affecting the identity of the machine").

138. [1901] R.P.D. & T.M. 222 (1901).

139. *Id.* at 226.

that the cumulative replacement of wheels, shafts, and then body finally works the change in identity?¹⁴⁰ If this is so, then what about the case in which the body is replaced, but not the wheels or shaft?

It is obvious that these questions could continue endlessly in any given repair-reconstruction case, which might involve multiple farm carts having vastly different repair histories. One could conclude that the fault here lies merely with the choice of the "identity" standard, which delves hopelessly into the metaphysics of machinery. But the failure of the identity standard should also raise questions about the wisdom of *Aro T's* heavy reliance on spentness as an overarching standard for repair-reconstruction disputes. Is the point of the repair-reconstruction distinction really to draw hypertechnical distinctions between making and using? Or is it to give legal effect to the unstated expectations of the patentee and purchaser regarding the use of the patented device? The spentness rhetoric, unfortunately, encourages the former.

B. The "Heart of the Invention": Component Importance and Inventiveness

Courts have shown no great proclivity for identifying the soul of the invention pursuant to the identity of the machine test, but they have continued to search for its heart. Courts have frequently considered whether the component replaced in the course of a replacement activity amounts to the "inventive" or "important" part of the patented device. Under this approach, replacement constitutes permissible repair if the purchaser replaces only the unimportant or non-inventive components of the device.¹⁴¹ Ordinarily, component inventiveness has been used as one factor in a multifactor analysis of repair-reconstruction.¹⁴²

A number of decisions have included an analysis that purports to assess the "inventiveness" of a component of the claimed combination. For example, in *Electric Auto-Lite Co. v. P. & D. Manufacturing Co.*,¹⁴³ which involved a patent directed to an automobile ignition sys-

140. This question arises in modern cases in the form of the "dominance" test. See *infra* Part II.D.

141. This standard, then, may be classified as another overall spentness standard, like the identity of machine test. That is, the fact that replacement of an "inventive" or "important" component is required indicates that the original device has become spent overall.

142. See, e.g., *Wagner Typewriter Co. v. F.S. Webster Co.*, 144 F. 405, 417 (C.C.S.D.N.Y. 1906) (noting that in the case of a typewriter patent, "[t]he typewriter ribbon and spool do not constitute a vital element . . . of the patented device," and as such, their replacement does not "affect[] the identity of the machine").

143. 78 F.2d 700 (2d Cir. 1935).

tem, the court listed the replacement parts sold by the defendant (springs, condensers, coils, and the like), and declared that none of the parts "is the essence of the inventions sued upon, nor do any constitute the part which serves to distinguish the invention."¹⁴⁴ This, coupled with other factors, justified a finding of repair.¹⁴⁵ Similarly, in *Micromatic Hone Corp. v. Mid-West Abrasive Co.*,¹⁴⁶ which concerned a holder for an abrasive stone, the court found it important that the replaced part (the stone) was not a "dominant" inventive element in the patent.¹⁴⁷ Perhaps expressing a similar approach, in *Standard Stoker Co. v. Berkley Machine Works & Foundry Co.*,¹⁴⁸ the Court of Appeals for the Fourth Circuit ruled that it was "not infringement for the defendant to manufacture repair parts old in the art."¹⁴⁹

Some early decisions, at least, appeared to recognize the fallacy of attempting to analyze a combination claim in terms of "inventive" and "non-inventive" components.¹⁵⁰ As the court in *Automotive Parts Co. v. Wisconsin Axle Co.*¹⁵¹ stated:

The invention is for a composite thing, embracing several elements or parts, all of which are necessary to and cooperate in the operation of the patented unit. We cannot subscribe to the view that the test of contributory infringement in the furnishing of parts for a combination invention

144. *Id.* at 703.

145. *Id.* at 704; *see also* *Foglesong Mach. Co. v. J.D. Randall Co.*, 239 F. 893, 895 (6th Cir. 1917) (finding permissible repair because the defendant did not disturb those elements "which represent the advance in the art").

146. 177 F.2d 934 (6th Cir. 1949).

147. *Id.* at 937 (finding permissible repair because "the abrasive stone is not patented, . . . [and is not] the dominant element of the invention").

148. 106 F.2d 475 (4th Cir. 1939).

149. *Id.* at 477. The decisions in *Foglesong Machine*, *Micromatic*, and *Standard Stoker* probably reflect a distinct lack of comfort with the notion of a contributory infringement remedy. The supply of unpatented components can give rise to liability under a contributory infringement theory. Requiring that those unpatented components at least be "patentable" or "inventive" may have seemed attractive to courts which thought that, otherwise, the patent right was being extended too far.

150. The fallacy is, of course, that the combination as a whole is inventive; each of the components may well be, and often are, "old" when considered in isolation. As Judge Markey put it, with characteristically acerbic wit: "Only God works from nothing. Man must work with old elements." Howard T. Markey, *Why Not the Statute?*, 65 J. PAT. OFF. SOC'Y 331, 334 (1983); *see also* *Custom Accessories, Inc. v. Jeffrey-Allan Indus., Inc.*, 807 F.2d 955, 959 (Fed. Cir. 1986) (arguing that because virtually all patent claims are drawn to combinations of elements, "[c]laiming an invention as 'a combination of old elements' leads improperly to an analysis of the claimed invention by the parts, not by the whole"); *Fromson v. Advance Offset Plate, Inc.*, 755 F.2d 1549, 1556 (Fed. Cir. 1985) ("There is no basis in the law . . . for treating combinations of old elements differently in determining patentability.").

151. 81 F.2d 125 (6th Cir. 1935).

is whether the parts furnished constitute the gist or essence of the invention; indeed, we cannot see how it may be said that any one element or another marks the advance step or is the essence of such an invention. There are cases, it is true, in which the phrase "essence of the invention" is used; but in our view, when the facts in those cases are considered, it cannot be said that the conclusions reached were the result of a logical selection of one or more elements of the combination as the gist or essence of the invention.¹⁵²

In addition to focusing on the "inventive" status of the replaced component, some courts have attempted to distinguish reconstruction from permissible repair by assessing the relative importance of the components. For example, in *Wagner Typewriter Co. v. F.S. Webster Co.*,¹⁵³ which addressed a typewriter ribbon mechanism that included a ribbon spool, the court found that the spool was not a "chief" or "vital" element of the combination, but merely an "ordinary working part," thus supporting the conclusion that replacement of the spool was permissible repair.¹⁵⁴ The Supreme Court, in *Leeds & Catlin Co. v. Victor Talking Machine Co. (No. 2)*,¹⁵⁵ tentatively endorsed this approach. The Court found that the sale of records to replace ones that were sold as part of a "talking machine," but that had worn out, constituted infringement because the records were "important" to the invention, and because, by contrast to the stylus, they served "to distinguish the invention—to mark advance upon the prior art."¹⁵⁶

Like the exercise of identifying the "inventiveness" of a replaced component, analyzing an individual component against some notion of "importance" presents fundamental difficulties.¹⁵⁷ First, like the failure of an "important" component, the failure of even a seemingly

152. *Id.* at 126.

153. 144 F. 405 (C.C.S.D.N.Y. 1906).

154. *Id.* at 417; *see also* Thomson-Houston Elec. Co. v. Kelsey Elec. Ry. Specialty Co., 75 F. 1005, 1009 (2d Cir. 1896) (stating that the permissible repair doctrine was "not intended to permit the unauthorized substitution of the vital and distinctively new part of an invention in place of one worn out by use"); *Hayslip v. Textag Co.*, 94 F. Supp. 425, 427 (N.D. Ga. 1950) (concluding that because "the tags are the main inventive element of the system . . . they are protected by the patent irrespective of whether they are separately patented"), *aff'd*, 192 F.2d 435 (5th Cir. 1951).

155. 213 U.S. 325 (1909), *overruled in part by* *Mercoid Corp. v. Mid-Continent Inv. Co.*, 320 U.S. 661 (1944).

156. *Id.* at 330.

157. At least one British court came to this conclusion very early on. *See Dunlop Pneumatic Tyre Co. v. Holborn Tyre Co.*, [1901] 18 R.P.D. & T.M. 222, 226 (1901) (rejecting an "essential element" test). *But cf.* *Sirdar Rubber Co. v. Wallington, Weston & Co.*, 1 Ch. 451, 454 (1905) (finding no impermissible reconstruction because defendant's replacement activities did not change "the distinguishing feature of the invention").

trivial component may, of course, render the entire combination inoperable. As the District Court in *F.F. Slocomb & Co. v. A.C. Layman Machine Co.*¹⁵⁸ stated:

It has been said that the furnishing of a vital feature or part of a patented mechanism, when essential to its construction and operation for the accomplishment of the ends for which it is intended, will amount, if unauthorized by the patentee, to a wrongful construction. But this cannot be sound as a general rule. The wearing out or breaking of a screw or bolt will as effectually prevent the operation of the mechanism as the destruction of a larger and more expensive feature. The wearing out or breaking down of a particular part essential to the operation of the mechanism therefore cannot be relied on as furnishing the test whether reconstruction, or merely repair or renewal, is required.¹⁵⁹

This reasoning may reflect the court's instinctive reaction against giving dispositive weight to device-oriented factors. One might speculate, for example, that the *Slocomb* court thought that the relative importance of a component was not likely to indicate the patentee's and purchaser's expectations; the importance of the component might have little to do with whether the purchaser could reasonably expect to need to replace the component in order to keep the combination in working order.

Second, the idea of dissecting a component from a patented combination and analyzing it violates principles that, today at least, are well-settled in patent law: Patent law inquiries as to the inventiveness of a claim must consider the combination as a whole, rather than isolate an individual element, whether or not the element is identifiable as the gist or heart of the invention.¹⁶⁰ The Supreme Court in *Aro I* rejected the patentee's argument that the "particular shape of the fabric" in a convertible top assembly "was the advance in the art—the very 'heart' of the invention—which brought the combination up to the inventive level," so that replacement of the fabric constituted reconstruction.¹⁶¹ The Court stated:

[I]f anything is settled in the patent law, it is that the combination patent covers only the totality of the elements in the claim. . . . [T]his Court has made it clear in the two *Mercoïd* cases that there is no legally recognizable or protected "es-

158. 227 F. 94 (D. Del. 1915), *aff'd*, 230 F. 1021 (3d Cir. 1916).

159. *Id.* at 97-98.

160. *Aro Mfg. Co. v. Convertible Top Replacement Co.*, 365 U.S. 336, 344 (1961).

161. *Id.*

sential" element, "gist" or "heart" of the invention in a combination patent.¹⁶²

One would suppose that in the wake of *Aro I*, it would be clear that reliance on an evaluation of the inventiveness or importance of an individual replaced component, isolated from the entirety of the patented combination, would be erroneous. The Supreme Court seemed to take this position when it explained *Aro I*'s impact in *Dawson Chemical Co. v. Rohm & Haas Co.*¹⁶³ Additionally, the Federal Circuit has gone out of its way to reinforce the notion that considering the heart of the invention in any of a variety of contexts, including the doctrine of permissible repair, would be improper.¹⁶⁴ Unfortunately, vestiges of the "heart of the invention" analysis have persisted, despite *Aro I*'s unmistakable denunciation.

For example, in *High Voltage Engineering Corp. v. Potentials, Inc.*,¹⁶⁵ the District Court paid lip service to the relevant language in *Aro I*, but then found it "appropriate to note that the essential advance in the art of Plaintiff's patented inclined-field acceleration tube is the inclina-

162. *Id.* at 344-45. The cases referred to by the Court are *Mercoid Corp. v. Minneapolis-Honeywell Regulator Co.*, 320 U.S. 680 (1944) and *Mercoid Corp. v. Mid-Continent Inv. Co.*, 320 U.S. 661 (1944). In these cases, the Court used the proscription against considering the "heart" of the invention to restrict the availability of the contributory infringement remedy; because there was no "heart" of the invention, there could be no contributory infringement even when a supplier sold articles specifically adapted for use as components in a patented combination. See *Minneapolis-Honeywell*, 320 U.S. at 684; *Mid-Continent*, 320 U.S. at 666-67. Accordingly, licensing others to sell such articles constituted patent misuse. *Minneapolis-Honeywell*, 320 U.S. at 684; *Mid-Continent*, 320 U.S. at 668. In the latter case, Justice Douglas declared that the Court "limit[ed] substantially the doctrine of contributory infringement. What residuum may be left we need not stop to consider." *Id.* at 669. However, less than ten years later, Congress restored the contributory infringement remedy. See 35 U.S.C. § 271(b), (c) (1994 & Supp. 1996).

The *Aro I* Court, too, undoubtedly was motivated by the desire to limit the contributory infringement remedy, and thus gave considerable weight to the language of the *Mercoid* cases notwithstanding the intervening passage of §§ 271(b) and (c). See *Aro I*, 365 U.S. at 340-41.

163. See 448 U.S. 176, 217 (1980) (explaining that the Court had "eschewed the suggestion that the legal distinction between 'reconstruction' and 'repair' should be affected by whether the element of the combination that has been replaced is an 'essential' or 'distinguishing' part of the invention").

164. See, e.g., *Para-Ordnance Mfg., Inc. v. SGS Importers Int'l, Inc.*, 73 F.3d 1085, 1087 (Fed. Cir. 1995) ("[W]hen determining obviousness, the claimed invention should be considered as a whole; there is no legally recognizable 'heart' of the invention."); *Porter v. Farmers Supply Serv., Inc.*, 790 F.2d 882, 887 (Fed. Cir. 1986) (rejecting an apparent "heart of the invention argument" in the context of a permissible repair decision). *But cf.* *Perkin-Elmer Corp. v. Westinghouse Elec. Corp.*, 822 F.2d 1528, 1533 n.8 (Fed. Cir. 1987) (acknowledging dicta that suggests that the "gist" or "essence" of the invention may be considered in determining priority of invention, and in determining infringement under the doctrine of equivalents, so long as claim limitations are not ignored).

165. 398 F. Supp. 18 (W.D. Tex. 1974), *aff'd*, 519 F.2d 1375 (5th Cir. 1975).

tion of the electrodes to minimize the drag on particles being accelerated through the tube."¹⁶⁶ The fact that the defendant never altered the inclination characteristic in the course of defendant's replacement activities seemed to weigh importantly in its favor on the issue of permissible repair.¹⁶⁷

In other cases, courts have resurrected the heart of the invention notion, but their use of it may have been justifiable on other grounds. The Supreme Court itself, speaking only a few years after *Aro I*, arguably relied upon this concept in finding permissible repair in *Wilbur-Ellis Co. v. Kuther*.¹⁶⁸ Reviewing an infringement claim arising when the purchaser of secondhand fish canning machines refurbished them and resized some of the components, Justice Douglas seemed to consider it important that the invention did not reside in "either the size or locational characteristics of the replaced elements . . . or the size of the commodity on which the machine operated."¹⁶⁹ If this is an assertion that repair should be found because the replaced components were those other than the essential or novel components, then Justice Douglas's analysis unquestionably strays from *Aro I* and cannot be squared with the Court's subsequent statements in *Dawson Chemical*.¹⁷⁰ On the other hand, the language might be read as merely reciting, albeit in clumsy fashion, the rule that the permissible repair doctrine does not apply when the replaced component is itself separately patented, because the replacement activity would in most circumstances clearly constitute an unauthorized making.

There is another example in Federal Circuit jurisprudence. In *Lummus Industries, Inc. v. D.M. & E. Corp.*,¹⁷¹ the patentee had apparently argued that a component of its patented cutting apparatus amounted to the heart of the invention, and the "heart" language found its way into the district court's jury instructions.¹⁷² Fortunately for the patentee, the Federal Circuit determined that the language concerning the "heart of the invention" had been presented in connection with the requirement of 35 U.S.C. § 271(c) that a component giving rise to a contributory infringement claim be "a material part of

166. *Id.* at 20.

167. *Id.*

168. 377 U.S. 422 (1964).

169. *Id.* at 423; *see id.* at 424-25 (noting that the "size of cans serviced by the machine was no part of the invention; nor were characteristics of size, location, shape and construction of the six elements in question patented").

170. *See supra* note 163.

171. 862 F.2d 267 (Fed. Cir. 1988) (per curiam).

172. *Id.* at 271.

the invention."¹⁷³ Acknowledging the *Aro I* and *Dawson Chemical* prescriptions against considering the "heart" in the repair-reconstruction analysis, the Federal Circuit nevertheless found the instructions free from error given the connection to the materiality language in § 271(c).¹⁷⁴

While it would seem that reference to the "heart" of the invention could be rationalized in this fashion in nearly any repair-reconstruction case, more recent pronouncements from the Federal Circuit confirm that cases like *Lummus* will be the exception. In *Sage Products, Inc. v. Devon Industries, Inc.*,¹⁷⁵ the court insisted that "[t]he size or relative importance of the replacement part to the patented combination is not relevant when determining whether conduct constitutes repair or replacement."¹⁷⁶

C. *The Parts of the Invention: Component Spentness*

It seems unlikely that quests for the heart or soul of the invention will ever yield satisfactory results in repair-reconstruction disputes. Many courts, however, have turned to an analysis of the remaining parts of the invention to distinguish repair from reconstruction. In general, courts have attempted to assess the physical qualities of the replaced component as an indicator of repair or reconstruction, reasoning that if the replaced component is perishable, has a short useful life, or is a low cost component, replacement of such a component should be deemed repair.¹⁷⁷

Twin notions of spentness are at work in many of these cases. Certainly, many of them may be considered true component spentness cases, insofar as a perishable component that has become worn out through use or has otherwise reached the end of its useful life might be considered spent. Courts inclined to find reconstruction, however, have used the concept of useful life to substantiate overall spentness, by concluding that when a component reaches the end of

173. *Id.*

174. *Id.*

175. 45 F.3d 1575 (Fed. Cir. 1995).

176. *Id.* at 1578 (citing *Aro Mfg. Co. v. Convertible Top Replacement Co.*, 365 U.S. 336, 345-46 (1961)).

177. Often, these qualities are relative measures—e.g., the useful life of the component relative to the useful life of the overall device. Thus, the inquiry is immediately more complicated than it would initially appear, because the qualities of the overall device, in addition to the qualities of the component, must be assessed.

its useful life, this is an indication that the patented device as a whole has become spent.¹⁷⁸

What is perhaps most striking about the perishability and useful life cases, however, is that they, too, illustrate the pitfalls of the spentness rhetoric. Indeed, a number of courts have an intuitive sense for this problem, and have employed perishability and useful life concepts as a proxy for the parties' expectations, rather than as evidence of spentness.

1. *Component Perishability, or How the Supreme Court Declared Toilet Paper To Be Disposable.*—Notwithstanding *Simpson's* express rejection of a component's "perishability" as a rationale for finding that a replacement activity concerning the component was permissible repair,¹⁷⁹ courts have, to varying degrees, considered perishability in their analyses. This is especially true of courts considering the repair-reconstruction problem prior to the Supreme Court's 1961 *Aro I* decision, although some post-*Aro I* cases also discuss perishability.

A notable early example is *Morgan Envelope Co. v. Albany Perforated Wrapping Paper Co.*,¹⁸⁰ in which the Court addressed the issue of tissue. The claimed invention concerned a problem of no little moment: the "temptation offered to greed or wastefulness" in the dispensing of toilet paper by the traditional cylindrical roll.¹⁸¹ The pertinent patent claims recited a toilet paper dispenser and an oblong or oval toilet paper roll designed to fit into the dispenser.¹⁸² Defendant produced the "Wheeler Pocket Companion,"¹⁸³ an oval toilet paper roll, with "the knowledge and intention that the paper so sold was to be used" by customers who had made authorized purchases of the plaintiff's toilet paper dispenser.¹⁸⁴

The Court struggled greatly with interrelated concepts of claim interpretation,¹⁸⁵ contributory infringement,¹⁸⁶ and the repair-reconstruction distinction. The Court purported to decide the case on con-

178. See, e.g., *Williams v. Barnes*, 234 F. 339, 340 (7th Cir. 1916) (noting that "[t]he test [of contributory infringement] is whether the element, as part of the patent combination, is perishable in its nature, consumed in the use, and necessarily to be replaced in each successive use of the combination").

179. See *supra* notes 87-92 and accompanying text.

180. 152 U.S. 425 (1894).

181. *Id.* at 426. In the true American entrepreneurial spirit, the inventors set out confidently to address this intractable problem of human nature via improved technology.

182. *Id.* at 427-30.

183. *Id.* at 429.

184. *Id.* at 431.

185. In particular, the Court had difficulty with the notion that the oval roll of toilet paper could properly be an element of the claimed combination. The court stated:

tributory infringement principles, finding that the patentee could not invoke the rationale of the contributory infringement cases because:

these cases have no application to one where the element made by the alleged infringer is an article of manufacture perishable in its nature, which it is the object of the mechanism to deliver, and which must be renewed periodically, whenever the device is put to use. . . . In this view, the distinction between repair and reconstruction becomes of no value, since the renewal of the paper is . . . neither the one nor the other.¹⁸⁷

Nevertheless, the Court proceeded to consider the repair-reconstruction distinction, concluding that an owner of the plaintiff's dispensers who purchased oval replacement rolls from the defendant did not directly infringe because he was doing "precisely what the patentee intended he should do: he replaces that which is in its nature perishable, and without the replacement of which the remainder of the device is of no value."¹⁸⁸ According to the Court, this result was consistent with the repair-reconstruction cases due to the perishable nature of the replaced component.¹⁸⁹

If this be so, then it would seem to follow that the log which is sawn in the mill; the wheat which is ground by the rollers; the pin which is produced by the patented machine; the paper which is folded and delivered by the printing press, may be claimed as an element of a combination of which the mechanism doing the work is another element.

Id.

186. Today, contributory infringement is governed by 35 U.S.C. § 271(c) (Supp. 1996), which provides that:

Whoever offers to sell or sells within the United States or imports into the United States a component of a patented machine, manufacture, combination or composition, or a material or apparatus for use in practicing a patented process, constituting a material part of the invention, knowing the same to be especially made or especially adapted for use in an infringement of such patent, and not a staple article or commodity of commerce suitable for substantial noninfringing use, shall be liable as a contributory infringer.

Id.

Although at the time of *Morgan Envelope* no statutory provision on contributory infringement existed in U.S. patent law, the Court had recognized the doctrine in a number of cases. See *Morgan Envelope*, 152 U.S. at 433 (citing cases); *supra* note 3 and accompanying text (discussing contributory infringement).

187. *Morgan Envelope*, 152 U.S. at 433.

188. *Id.* at 434. The Court stated that the case was analogous to *Simpson*, and quoted the *Simpson* Court's language rejecting perishability as a factor in the repair-reconstruction analysis. *Id.* at 434-35.

189. *Id.* at 433-35.

The Supreme Court again turned to the perishability factor in *Leeds & Catlin Co. v. Victor Talking Machine Co. (No. 2)*.¹⁹⁰ The patent claims concerned a record player and recorded disc. The patentee alleged that the defendant's sale of discs which could be played on the patentee's machine violated an injunction that had been entered after an infringement proceeding.¹⁹¹ The Court stated that "the lower courts found that the discs were not perishable," distinguishing the earlier case of *Morgan Envelope* where "it was made a determining circumstance that the paper perished by its use."¹⁹² Indeed, as might be guessed, the defendant's customers generally were purchasing discs "to increase the repertory of tunes," not to replace worn-out or broken records.¹⁹³ This fact counseled in favor of reconstruction.¹⁹⁴

Some courts appeared to hold up the inherently perishable or non-perishable nature of the replaced components as the standard of repair.¹⁹⁵ For example, in *Goodyear Shoe Machinery Co. v. Jackson*,¹⁹⁶ the court expressly defined repair as "'restoration to a sound, good, or complete state after decay, injury, dilapidation, or partial destruction.'"¹⁹⁷

This definition may have encouraged other courts to take the device-oriented spentness rhetoric to its extreme. For example, in *Micro-matic Hone Corp. v. Mid-West Abrasive Co.*,¹⁹⁸ the court characterized cases such as *Simpson* and *Morgan Envelope* as resting on a distinction between "soft" and "hard" parts:

It has long been the established rule that if one of the parts of a patented combination, the part being not patentable per se, is made of soft material and wears out, the other parts of the combination remaining capable of performing their normal and expected functions, the right to replace the

190. 213 U.S. 325 (1909), *overruled in part* by *Mercoid Corp. v. Mid-Atlantic Inv. Co.*, 320 U.S. 661 (1944).

191. *Id.* at 329-31.

192. *Id.* at 335.

193. *Id.* at 336 (quoting *Victor Talking Mach. Co. v. Leeds & Catlin Co.*, 150 F. 147, 147 (S.D.N.Y. 1907)).

194. *Id.* at 336-37; *cf.* *William v. Barnes*, 234 F. 339, 340 (7th Cir. 1916) (finding permissible repair under the *Morgan Envelope* principle that a purchaser may replace an inherently perishable component in a patented combination).

195. *See, e.g.*, *Hayslip v. Textag Co.*, 94 F. Supp. 425, 427 (N.D. Ga. 1950) (noting as a factor counting in favor of reconstruction the fact that replaced tags were not "perishable, fragile or intended to be consumed or exhausted in normal operation of the system"), *aff'd*, 192 F.2d 435 (5th Cir. 1951).

196. 112 F. 146 (1st Cir. 1901).

197. *Id.* at 150.

198. 177 F.2d 934 (6th Cir. 1949).

worn-out part exists quite as definitely as in the case of breakage.¹⁹⁹

The court seemed to be suggesting that the repair-reconstruction inquiry—which might seem to be about actions and expectations in addition to being about devices themselves—turns predominantly on the inherent qualities of the replaced component.²⁰⁰

Like the “importance” and “inventiveness” criteria, perishability usually appears in these cases as one factor in a multifactor analysis. It might be argued, then, that if *Aro I* rejected the multifactor approach,²⁰¹ it must have thrown out the perishability factor as well. While the Court’s opinion in *Aro I* is unclear, Justice Black’s concurring opinion does declare that the Court did, indeed, expunge the perishability factor.²⁰²

Nevertheless, the perishability criterion has continued to manifest itself in post-*Aro I* case law. For example, in *TSC Industries, Inc. v. International Harvester Co.*,²⁰³ the Seventh Circuit analogized to the *Micromatic Hone*²⁰⁴ decision, apparently persuaded by the distinction between “soft” components and other types of components.²⁰⁵ In the Federal Circuit, in *Porter v. Farmers Supply Service, Inc.*,²⁰⁶ the court, taking note of lower court findings that the replaced components—harvester disks used in a tomato harvesting machine—had to be repeatedly replaced due to wear, and that the patentee sold replacement disks, made a determination of repair.²⁰⁷ The Federal Circuit

199. *Id.* at 936 (citations omitted); see also *Automotive Parts Co. v. Wisconsin Axle Co.*, 81 F.2d 125, 126-27 (6th Cir. 1935) (stating that “if one of the parts is made of defective or soft material and wears out, the other parts of the combination being capable of performing their normal and expected functions, the right to replace the worn-out part exists . . . quite as definitely as in the case of breakage”). For an earlier British case on point, see *Sirdar Rubber Co. v. Wallington, Weston & Co.*, 1 Ch. 451, 454 (1905) (finding permissible repair in a case involving a patent on a tire and rim combination, because only the tire, which was “the soft wearing part” of the combination, was replaced).

200. See *Micromatic Hone*, 177 F.2d at 936-37.

201. See *supra* notes 112-124 and accompanying text.

202. *Aro Mfg. Co. v. Convertible Top Replacement Co.*, 365 U.S. 336, 354 (1961) (Black, J., concurring) (arguing that “deciding whether a patented article is ‘made’ does not depend on whether an unpatented element of it is perishable”).

203. 406 F.2d 53 (7th Cir. 1968).

204. See *supra* notes 198-200 and accompanying text.

205. *Id.* at 55 (concluding that the replacement of certain parts in a “doffer assembly” in a rotary cotton-picking machine constituted permissible repair). The district court, by contrast, had concluded that after *Aro I* perishability was not a factor which courts should consider. See *Tractor Supply Co. v. International Harvester Co.*, 155 U.S.P.Q. (BNA) 420, 423 (N.D. Ill. 1967) (noting that “[t]he remaking of a patented article does not depend upon whether an element thereof is perishable” (citing *Aro I*, 365 U.S. at 338-39)).

206. 790 F.2d 882 (Fed. Cir. 1986).

207. *Id.* at 885.

stated that courts in "a number of cases, before and after *Aro I*, that involve[d] tools having parts subject to wear . . . 'have held almost uniformly that replacement of a worn part in a patented combination is repair.'"²⁰⁸

The continued use of the perishability factor is probably unfortunate because it binds the repair-reconstruction standard too tightly to the qualities of the device at issue. This may be counterproductive because, first, as a matter of precedent, it seems difficult to square the notion of perishability as presented in later cases with *Simpson's* express prohibition and *Aro I's* apparent disapproval of this criterion.²⁰⁹ Second, a perishability standard might create too broad a right of repair. Most repair-reconstruction cases concern the replacement of worn components, and, as at least one court recognized long ago, it would seem that any component that becomes so worn that a user is motivated to replace it is, for this very reason, perishable.²¹⁰

On the other hand, reliance on perishability could also be under-inclusive to the extent that the replacement activities concerned perfectly durable parts that broke as a result of ordinary use of the patented combination. For example, in a case involving tips on "blowpipes" used in metal cutting and welding operations, the plaintiff argued that the doctrine of permissible repair could not apply because the evidence showed that tips had to be replaced "not because the tips wear out, but because they are abused by careless and incompetent workers and destroyed by accidents."²¹¹ Rather than admitting to the inadequacy of the perishability standard, the court "deemed" the replaced tips perishable:

If it is usual for a material number of accidents to occur in carrying on the trade, if it is customary for hasty workmen to accelerate the completion of their tasks by rough handling of their blowpipes, if the blowpipes are frequently used by un-

208. *Id.* at 886 (quoting *Porter v. Farmers Supply Serv., Inc.*, 617 F. Supp. 1175, 1186 (D. Del. 1985)).

209. *See supra* notes 91, 202 and accompanying text.

210. *See F.F. Slocomb & Co. v. A.C. Layman Mach. Co.*, 227 F. 94 (D. Del. 1915), *aff'd*, 230 F. 1021 (3d Cir. 1916). This court stated:

If the parts of the mechanism replaced by the repair parts furnished by the defendant were "substantially non-perishable" I fail to perceive why they should have been replaced, unless the owners and users of the machines desired to throw away their money in paying the defendant for repair parts of which there was no need. It is more reasonable to conclude that repair parts were bought from the defendant because the owners and users of the machines found there was need of them for the operation or efficient operation of the patented mechanism.

Id. at 98.

211. *Harris Calorific Co. v. Marra*, 95 F.2d 870, 871 (3d Cir. 1938).

skilled welders, and if these practices result in or contribute to the destruction of the tips, then we are of the opinion that the tips may be deemed perishable through use.²¹²

Third, heavy reliance on perishability, or on spentness rhetoric generally, threatens to retard the common law evolution of repair-reconstruction standards because the standards cannot easily be divorced from the physical peculiarities of the devices at issue. Decisions become purely device-specific, leading to the emergence of a crazy quilt pattern in which "knife" cases abide by one standard, "drill" cases another, and so forth.

Finally, reliance on the inherently perishable nature of the goods as a criterion in itself would simply miss the point. In a correct analysis, perishability would be a useful factor, among many others, as a proxy for the patentee's and the purchaser's expectations.

Indeed, careful analysis of the early cases yields abundant evidence that at least some courts followed precisely this approach,²¹³ while others employed perishability as a proxy for intent. For example, in *Morgan Envelope*, the perishable nature of the toilet paper easily supported the inference that the purchaser who replaced the toilet paper was doing "precisely what the patentee intended he should do."²¹⁴ In another early case which concerned a claim directed to a coal-mining machine in combination with a protective device, the court found it "evident that the protective device was of a perishable character" because "[i]ts destruction, or that of some of its parts, *was contemplated by the appellant*."²¹⁵ Finally, the use of perishability as a proxy for intent, expressed as merely one of a number of factors that might bear on repair-reconstruction, is precisely the use of perishability urged by Justice Brennan's concurrence in *Aro I*.²¹⁶

212. *Id.* The court's reliance on customary practice is important, because this may be the most reliable indicator of the patentee's and purchaser's expectations. See *infra* Parts IV-V.

213. See, e.g., *Goodyear Shoe Mach. Co. v. Jackson*, 112 F. 146, 150 (1st Cir. 1901) (favoring a multifactor approach taking into account "all the facts and circumstances presented, with an intelligent comprehension of the scope, nature, and purpose of the patented invention, and the fair and reasonable intention of the parties"); see also *Wagner Typewriter Co. v. F.S. Webster Co.*, 144 F. 405, 416 (C.C.S.D.N.Y. 1906) (holding that perishability is one of several factors for courts to consider in evaluating infringement).

214. *Morgan Envelope Co. v. Albany Perforated Wrapping Paper Co.*, 152 U.S. 425, 434 (1894).

215. *Morgan Gardner Elec. Co. v. Buettner & Shelburne Mach. Co.*, 203 F. 490, 493 (7th Cir. 1913) (emphasis added).

216. *Aro Mfg. Co. v. Convertible Top Replacement Co.*, 365 U.S. 336, 364 (1961) (Brennan, J., concurring) (listing among factors for consideration the "common sense understanding and intention of the patent owner and the buyer of the combination as to its

Another line of cases seems to employ perishability as a proxy for the patentee's intent, although perhaps less directly. One such case concerned a patent claiming a horse collar stuffing machine containing numerous parts, some of which had been replaced by the defendant.²¹⁷ The court found it significant that the replaced components "were such as the plaintiff sold or voluntarily furnished to customers for use in repairing."²¹⁸ It might seem that the evidence would be significant as an indicator of the patentee's expectations, and perhaps the court had that in mind.²¹⁹ However, it articulated its analysis in device-oriented terms: by participating in a replacement parts market, the plaintiff recognized the "perishable nature" of the components.²²⁰ This is a fine example of the roundabout analysis that the spentness rhetoric encourages, because the real significance in finding the components "perishable" was to indicate that the patentee could not complain when the defendant replaced those parts.²²¹

2. *Component Useful Life and Cost.*—Many courts have analyzed the repair-reconstruction problem by assessing component useful life and, on occasion, component cost. Two distinct uses of these concepts are apparent. First, a number of courts have employed the useful life concept to support a conclusion of reconstruction. They reason that the patented device becomes spent overall when a certain component reaches the end of its useful life, so that its replacement constitutes reconstruction. Other cases more closely resemble the perishability cases, in that a finding that a component has reached the end of its useful life before being replaced justifies a conclusion that the replacement is mere repair.

An example of the first approach can be found in the prototypical reconstruction case, *Cotton-Tie Co. v. Simmons*,²²² which concerned claims to a cotton bale tie that included a metallic band and a buckle

perishable components"); see also Hildreth, *supra* note 18, at 535 (arguing that the patentee's intent is the controlling factor underlying component spentness).

217. *Foglesong Mach. Co. v. J.D. Randall Co.*, 239 F. 893, 894-95 (6th Cir. 1917).

218. *Id.* at 895.

219. *Id.*; see also *Aktiebolag v. E.J. Co.*, 121 F.3d 669, 673 (Fed. Cir. 1997) (stating that the existence of a replacement parts market is a factor in the repair-reconstruction determination, but failing to explain whether the factor is a proxy for the parties' reasonable expectations), *cert. denied*, 118 S. Ct. 1337 (1998).

220. *Foglesong Mach.*, 239 F. at 895.

221. See also *Westinghouse Elec. & Mfg. Co. v. Hesser*, 131 F.2d 406, 410 (6th Cir. 1942) (placing significance on the recognition by the patentee of the "perishable nature of the parts" in finding repair and not reconstruction).

222. 106 U.S. 89 (1882).

capable of receiving the free end of the band.²²³ In this case, the defendants pieced together sections of old bands and attached to the refurbished band a used buckle, notwithstanding a warning against reuse that the patentee had stamped into the metal bands.²²⁴

The Court found reconstruction because a component of the patented device—specifically, the band—had reached the end of its useful life once the bales had been delivered to their destination.²²⁵ Because the functionality of the band had been exhausted, the Court determined that the patented device as a whole was spent, and that the piecing together of the bands was impermissible reconstruction.²²⁶ As the Court stated:

The band was voluntarily severed by the consumer at the cotton-mill because the tie had performed its function of confining the bale of cotton in its transit from the plantation or the press to the mill. Its capacity for use as a tie was voluntarily destroyed. As it left the bale it could not be used again as a tie. As a tie the defendants reconstructed it²²⁷

Another early case, *Davis Electrical Works v. Edison Electrical Light Co.*,²²⁸ similarly presents an excellent example of the resort to a useful life concept as part of a reconstruction determination.²²⁹ Defendants refurbished patented Edison incandescent light bulbs²³⁰ by breaking off the tip of the glass lamp bulb, removing and replacing the burned-out filament, and then evacuating and resealing the bulb.²³¹

223. *Id.* at 92.

224. *See id.* at 91 (noting that the warning stated “Licensed to use once only”).

225. *Id.* at 94.

226. *Id.*

227. *Id.* Although the Court noted that *Wilson v. Simpson* stood for the principle that “temporary parts wearing out in a machine might be replaced to preserve the machine,” *id.*, the Court clearly applied an overall spentness approach, noting that the device’s “use as a tie was voluntarily destroyed,” *id.* Moreover, the component spentness approach might have yielded the opposite result. The defendant might have argued that the metal band was a “temporary” part because it had a shorter useful life than the combination as a whole and that replacement of the band was therefore permissible repair. Had the Court followed this approach, the label license on the bands would have figured more prominently in the analysis. The role of the label license in *Cotton-Tie* has been a source of considerable debate. *See Fromberg, Inc. v. Gross Mfg. Co.*, 328 F.2d 803, 809 (9th Cir. 1964) (stating that, “if [*Cotton-Tie*] still has validity,” it has been given “a very narrow effect”).

228. 60 F. 276 (1st Cir. 1894).

229. *Id.* at 279.

230. Edison’s claim was broadly stated as “[t]he combination of carbon filaments with a receiver made entirely of glass, and conductors passing through the glass, and from which receiver the air is exhausted.” *Id.* at 278.

231. *Id.* at 276.

Had the court adhered strictly to a component perishability analysis, perhaps it would have reached the uncomfortable result that the defendant's activities amounted to permissible repair, because it would have been difficult to avoid the conclusion that the filament was a perishable component of the combination.²³² Instead, the court looked to the combination as a whole in light of an economic conception of overall spentness; the court implied that the combination was spent prior to the replacement activity, and that the replacement activity should be categorized as reconstruction because the cost of the replacement activity was far greater than the sale price of the original light bulb.²³³

This persuaded the court, speaking "in view of things as things, and of a practical understanding of reparation and reconstruction,"²³⁴ to adopt the district court's conclusion that opening the glass bulb and inserting a new filament was the act of making a new lamp, and thus reconstruction.²³⁵

A second group of cases employs the useful life concept to justify a conclusion of repair. A good early example can be found in Justice Holmes's opinion in *Heyer v. Duplicator Manufacturing Co.*²³⁶ The claim was directed to a copying machine that included a machine frame, a "duplicating band" containing a gelatine substance, and "a spool on which said duplicating band [was] wound."²³⁷ The duplicating band apparently contained enough gelatin to make about 100 copies.²³⁸ Justice Holmes found the defendant's sale of replacement duplicator bands to be permissible repair based in part upon the relatively short expected useful lifetime of the bands: "The [copying] machine lasts indefinitely, the bands are exhausted after a limited use

232. The same result would have followed if the court, applying a component spentness approach, had considered the filament to have reached the end of its useful life.

233. *Davis*, 60 F. at 281; *see id.* at 282 (invoking the identity of the machine standard by observing that the combination without a filament was not a lamp at all, but a mere manufacturer's blank).

234. *Id.*; *see also* *Monroe Auto Equip. Co. v. Precision Rebuilders, Inc.*, 229 F. Supp. 347, 352 (D. Kan. 1964) (finding impermissible reconstruction because the seal that was replaced "was intended to last the life of the shock absorber . . . and was not merely a temporary part; and [because] at the time the used shock absorbers were processed, they had fulfilled their intended purpose and had been substantially destroyed as intended, and were considered junk"); *Champion Spark Plug Co. v. Emener*, 16 F. Supp. 816, 821 (E.D. Mich. 1936) (distinguishing permissible reconditioning of used spark plugs from impermissible refabrication of the "functional properties" of spark plugs that had "fully performed their purpose and had no further value except as scrap").

235. *Davis*, 60 F. at 282.

236. 263 U.S. 100 (1923).

237. *Id.* at 101 n.1.

238. *Id.* at 101.

and manifestly must be replaced.”²³⁹ In addition, Justice Holmes observed that while the copying machine was “costly,” the duplicator bands were “cheap.”²⁴⁰ This factor, too, clearly contributed to the Court’s conclusion that the defendant was engaged in mere permissible repair.²⁴¹

Courts have employed a cost-of-component criterion in the same fashion,²⁴² but the current status of the cost-of-component factor is uncertain. The *Aro I* opinion arguably rejects it as one of the improper factors considered by the lower courts.²⁴³ However, this factor finds at least some limited support among Federal Circuit cases.²⁴⁴

Superficially, the useful life concept seems attractive, whether used as part of an “overall spentness” approach to find reconstruction, or as part of a component spentness approach to find repair. Useful life (and, relatedly, component cost) would seem to be readily quantifiable, and might be invested with a bit more precision than uncertain notions of “perishability.”²⁴⁵ Whether the case law supports this con-

239. *Id.* at 102 (citing *Wilson v. Simpson*, 50 U.S. (9 How.) 109, 126 (1850)). Like the cases that adopt the perishability rhetoric, this case places considerable importance on the spentness of a component. It is important to recognize that this analysis differs fundamentally from an analysis of the overall spentness of the combination. The former analysis assesses spentness of the component and finds repair where the replaced component is truly spent at the time of the replacement activity. The latter might also involve an assessment of the spentness of the component, but only as a way of determining whether the overall combination was spent. Accordingly, under the latter analysis, a finding that the component was truly spent at the time of the replacement activity might lead to the conclusion that the overall combination was rendered incomplete and that replacing the spent component would be tantamount to remaking the combination.

240. *Id.*

241. *Id.*

242. That is, where the cost of the replaced component is low relative to the cost of the entire combination, the court is more likely to find repair. See, e.g., *Electric Auto-Lite Co. v. P. & D. Mfg. Co.*, 109 F.2d 566, 567 (2d Cir. 1940) (per curiam) (asserting that permissible repair depends in part on whether “it is cheaper to insert a new part than to cobble the old one back into service”).

243. *Aro Mfg. Co. v. Convertible Top Replacement Co.*, 365 U.S. 336, 345 (1961) (“No element, not itself separately patented, that constitutes one of the elements of a combination patent is entitled to patent monopoly, however essential it may be to the patented combination *and no matter how costly or difficult replacement may be.*” (emphasis added)).

244. See, e.g., *Porter v. Farmers Supply Serv., Inc.*, 790 F.2d 882, 885 (Fed. Cir. 1986) (acknowledging that the district court took into account the fact that the replaced components were inexpensive compared to the cost of the patented machine). Other cases have proposed to consider the cost of the component as a way of determining whether the overall combination should be deemed spent. See *infra* Part II.D.

245. See, e.g., *F.F. Slocomb & Co. v. A.C. Layman Mach. Co.*, 227 F. 94, 98 (D. Del. 1915) (criticizing the “perishability” rhetoric, and embracing an analysis that blended useful life and component cost), *aff’d*, 230 F. 1021 (3d Cir. 1916). The court stated:

If, by way of illustration, patented mechanism be composed of various parts and elements the most expensive of which have an average life of twenty years, and

cept of useful life depends upon whether *Aro I* strictly forbids resort to a multiple-factor inquiry. The *Aro I* majority opinion does not explicitly preclude the analysis of useful life, and the concurring opinions provide contradictory signals.²⁴⁶

In practice, however, the useful life/component cost standard has given rise to numerous dilemmas. One difficulty, of course, is that the assessment of useful life (or of component cost) might conflict with the assessments of component importance or inventiveness. Even worse, assessments of useful life and of component cost might conflict with each other. For example, in *Micromatic Hone*, the patentee contended that the replacement of the abrasive stone was reconstruction because the stone was a relatively expensive component compared to the cost of the overall combination.²⁴⁷ Although correct, this contention conflicted with the court's assessment of useful life, and of the importance and inventiveness contributed to the overall combination by another element of the combination—the backing member or “stone holder.”²⁴⁸ Unable to resolve this conflict, the court discarded the cost-of-component standard:

Obviously, the dominant element in the patent was in the improved stone holder, regardless of its low cost of manufacture. It also seems clear to us that while its low cost of manufacture warranted a purchaser in throwing it away after the initial stone was worn down, rather than returning it for a refill when the purchaser did not care to be bothered with such details, nevertheless, the metal stone holder was not expended or destroyed, but, on the contrary, had a continued useful life and was available to the purchaser of it for refilling if he desired to do so Under the circumstances, it does

other parts or features of comparatively trifling cost are subjected in the operation of the mechanism to such wear as to require renewal or replacement within a period of a few months, or of a year or two, it would seem reasonable and sensible to treat such renewal or replacement as involving repairs in contradistinction to reconstruction.

Id.

246. Compare *Aro I*, 365 U.S. at 363 (Brennan, J., concurring) (“Appropriately to be considered are the life of the part replaced in relation to the useful life of the whole combination.”) with *id.* at 357 (Black J., concurring) (“[T]here should be no attempt to decide whether there is a making by comparing the time that the different elements of such a patent normally will exist if let alone.”).

247. *Micromatic Hone Corp. v. Mid-West Abrasive Co.*, 177 F.2d 934, 937 (6th Cir. 1949) (stating the patentee's contention that “the cost of the metal backing member is materially less than the cost of the stone”).

248. *Id.*

not follow that the [useful] life of the metal stone holder is the same as the life of the abrasive stone.²⁴⁹

Another example of this dilemma is *Landis Machine Co. v. Chaso Tool Co.*²⁵⁰ The patented combination concerned die heads fitted with “chasers,” which were cutters for cutting threads.²⁵¹ The defendants sold replacement chasers.²⁵² The chasers were relatively inexpensive compared to the cost of the overall combination—about nine dollars for the chasers compared to between ninety dollars to \$350 for the overall combination, depending on the patentee’s prices.²⁵³ While this factor suggested that replacement of the chasers was permissible repair, the evidence also seemed to indicate that customers replaced the chasers before they were truly worn out; the chasers could, apparently, be ground and sharpened for additional use. This fact suggested a finding of reconstruction.²⁵⁴

The court addressed the conflict by discarding the useful life criterion.²⁵⁵ The court stated that it was “unimportant that the parts replaced would, if properly used, last as long as the patented heads.”²⁵⁶ Instead, the court focused not only on the relatively low cost of the replaced component, but also on the patentee’s own business practices.²⁵⁷ The patentee had adopted the age-old tactic of selling the die heads for a reduced price, hoping to reap a profit by controlling the market for replacement chasers.²⁵⁸ This practice, according to both the district court and the circuit court, confirmed that the patentee intended the chasers to be “perishable,” and justified the conclusion of permissible repair.²⁵⁹

Another more serious problem that has arisen in a number of cases concerns the fact that, like the perishability standard, the useful life/cost standard has proved underinclusive. This problem arises in cases in which the replaced component has not reached the end of its useful life when it is replaced (which suggests reconstruction), yet the court seeks a way to justify the replacement activity as permissible repair. For example, early courts had difficulty determining whether a

249. *Id.*

250. 141 F.2d 800 (6th Cir. 1944).

251. *Id.* at 802.

252. *Id.*

253. *Id.* at 803.

254. *Id.* at 804.

255. *Id.*

256. *Id.*

257. *Id.* at 803.

258. *Id.*

259. *Id.*

component that was broken through careless handling (as distinct from becoming worn in the course of careful use) had reached the end of its useful life, so that replacement would be justified as permissible repair.²⁶⁰

Another controversial example concerns replacement activities in which components of the patented device are modified for purposes of achieving improved performance, even where those components are not necessarily spent. This scenario arose in an early case involving a patented candy wrapping machine whose main components were a cutter table and a wrapping wheel.²⁶¹ The defendant modified a patented machine so that it could wrap candy of a different size, which necessitated changes to the sizes of the pockets in the wrapping wheel and the arrangement of the cutting knives on the cutting table, among others.²⁶² Obviously, useful life remained in the components of the patented device, but the court nevertheless found reconstruction.²⁶³

The Supreme Court took a different approach in *Wilbur-Ellis Co. v. Kuther*.²⁶⁴ The defendant purchased secondhand some corroded, inoperable fish canning machines that had been designed to pack one-pound cans, but then cleaned and modified them to handle smaller cans.²⁶⁵ The modifications entailed grinding down certain components and fitting inserts to others, thus affecting six of the thirty-five components of the machine.²⁶⁶ The appellate court found reconstruction under the authority of *George Close*,²⁶⁷ but the Supreme Court reversed.²⁶⁸ In a remarkably opaque opinion that seems to rest on a notion of component inventiveness,²⁶⁹ the Court refused to craft an absolute rule that improvements to purchased patented goods con-

260. See, e.g., *Harris Calorific Co. v. Marra*, 95 F.2d 870, 871 (3d Cir. 1938) (finding that components "may be deemed perishable through use," whether the use is "careful and skillful" or "rough"). See *supra* notes 211-212 and accompanying text.

261. *Ideal Wrapping Mach. Co. v. George Close Co.*, 23 F.2d 848, 849 (D. Mass.), *aff'd*, 29 F.2d 533 (1st Cir. 1928).

262. *Id.*

263. See *id.* at 850 (employing the identity of machine standard); see also *Miller Hatcher-ies, Inc. v. Buckeye Incubator Co.*, 41 F.2d 619, 622 (8th Cir. 1930) (stating that modifications to incubator trays to enable them to increase their capacities constituted reconstruction because they altered the identity of the machine).

264. 377 U.S. 422 (1964).

265. *Id.* at 423.

266. *Id.*; see also *Leuschner v. Kuther*, 314 F.2d 71, 72-73 (9th Cir. 1963) (discussing the facts of the case at the appellate level), *rev'd sub nom.* *Wilbur-Ellis Co. v. Kuther*, 377 U.S. 422 (1964).

267. *Leuschner*, 314 F.2d at 74.

268. *Wilbur-Ellis*, 377 U.S. at 425.

269. See *supra* Part II.B (discussing component inventiveness).

stitute reconstruction.²⁷⁰ The Court also employed the useful life concept. The machines at issue “had years of usefulness remaining though they needed cleaning and repair.”²⁷¹ The Court refrained from characterizing the defendant’s activities as true repair, but instead stated that “in adapting the old machines to a related use [they] were doing more than repair in the customary sense; but what they did was kin to repair for it bore on the useful capacity of the old combination, on which the royalty had been paid.”²⁷²

On an intuitive level, the finding in *Wilbur-Ellis* of permissible repair seems correct, yet this case demonstrates that the notion of useful life is not as predictable as it would initially appear to be. Subsequent decisions building on *Wilbur-Ellis* are to the same effect. For example, in the Federal Circuit’s recent decision of *Hewlett-Packard Co. v. Repeat-O-Type Stencil Manufacturing Co.*,²⁷³ the court relied upon the reasoning in *Wilbur-Ellis* to conclude that defendant’s modifications to the plaintiff’s patented ink cartridges constituted permissible repair.²⁷⁴ The defendant purchased unused, filled ink cartridges from the patentee, modified a cap on the cartridge so that the cartridge would be refillable by end users, and sold the cartridges as “refillable” cartridges.²⁷⁵ Here again, the case is difficult when evaluated under the useful life criterion. On the one hand, when the ink is exhausted, the cartridge is rendered nonfunctional for its intended purposes. On the other hand, useful life remains in the cartridge itself. The court determined that useful life was defined by the life of the entirety of the cartridge, not merely by the duration of the ink supply,²⁷⁶ on the basis of *Wilbur-Ellis*, in which the purchase price of the patented item included a royalty payment intended to extend for the full useful life of the *entire* patented combination.²⁷⁷ It is worth asking, however, whether the court really reached this result by strict consideration of useful life. It seems at least equally plausible that the court was really analyzing the parties’ expectations, although it stoutly denied that the patentee’s intentions informed the analysis.²⁷⁸

270. *Wilbur-Ellis*, 377 U.S. at 425.

271. *Id.* at 424.

272. *Id.* at 425.

273. 123 F.3d 1445 (Fed. Cir. 1997), *cert. denied*, 118 S. Ct. 1304 (1998).

274. *Id.* at 1452-53.

275. *Id.* at 1448.

276. *Id.* at 1453.

277. *Id.* at 1452 (citing *Wilbur Ellis Co.*, 377 U.S. 422).

278. See *infra* Part III (exploring the role of intent in repair-reconstruction analysis in this case and others); see also *Electric Auto-Lite Co. v. P. & D. Mfg. Co.*, 109 F.2d 566, 567 (2d Cir. 1940) (per curiam) (linking useful life to intent by stating that “[t]he theory on which the repair of a patented article is allowed at all is that the patentee intends the buyer

In a third set of recent cases, courts have seriously mangled the concept of useful life by turning to a notion of "effective spentness" to explain why the replacement of a part that retains additional useful life is nevertheless permissible repair. In *Everpure, Inc. v. Cuno, Inc.*,²⁷⁹ the claims were directed to a filter assembly comprised of a head and a filter cartridge, which featured a neck designed for insertion into the head.²⁸⁰ A filter was sealed into the cartridge.²⁸¹ The defendant, Cuno, sold cartridges fitted with filters, and also sold an adapter that would allow purchasers of Cuno cartridges to attach them to Everpure heads.²⁸²

Analyzed by resort to a device-oriented standard such as component useful life, this case presents difficulties on multiple fronts. The useful life of the filter is relatively short, but the useful life of the cartridge itself is much longer. Accordingly, the useful life standard cannot resolve the repair-reconstruction problem. Moreover, the adapter would seem to defy analysis altogether under the useful life standard.

Seeming to understand this dilemma, the court turned unhesitatingly to a consideration of the patentee's business practices, just as the *Landis Machine* court had done.²⁸³ Rather than attempt to ascribe a useful life or a degree of perishability to the composite filter-and-cartridge structure, the court considered the design as indicative of the patentee's deliberate business decision to force its customers to replace the entire cartridge, including the filter, rather than the filter alone.²⁸⁴ This theory was confirmed by the patentee's instruction to customers to "[s]ervice with a new cartridge . . . at least once a year," which accompanied the directions for changing the cartridge.²⁸⁵

The court could have advanced matters by pointing out its need to depart from the useful life standard to render its decision. Instead, the court framed its holding in the language of component spentness: "Thus Everpure has designed and conducts a business scenario in which the entire cartridge, including its sealed-in neck and filter, is

to have a longer use of it than the life of the shortest-lived part" (citing *Wilson v. Simpson*, 50 U.S. (9 How.) 109, 126 (1850); *Heyer v. Duplicator Mfg. Co.*, 263 U.S. 100 (1923)).

279. 875 F.2d 300 (Fed. Cir. 1989).

280. *Id.* at 301; *see id.* at 304-05 (Newman, J., dissenting) (reciting claim four of the patent-in-suit).

281. *Everpure*, 875 F.2d at 301.

282. *Id.*

283. *Id.* at 303; *see supra* notes 257-259 and accompanying text (discussing the *Landis Machine* court's attention to the patentee's business practices).

284. *Everpure*, 875 F.2d at 303 (stating that Everpure "is 'hoist on its own petard,'" because "Everpure and Everpure alone made the business decision to sell disposable cartridges and to render its filter irreplaceable without replacement of the entire cartridge").

285. *Id.*

spent when the filter wears out.”²⁸⁶ Instead of admitting the limitations of the spentness rubric, the court extended it beyond any reference to physical facts.²⁸⁷

Later cases have continued to cling to the spentness rhetoric, further extending this notion of “effective” spentness. These cases concerned medical devices that included components subject to contamination in ordinary use. In *Sage Products*,²⁸⁸ the claims were directed to a “sharps” disposal system that included an outer enclosure and a removable inner container for receiving sharp instruments used in medical procedures.²⁸⁹ There was abundant evidence that the patentee encouraged customers to dispose of the inner container when it became filled with sharps: the patent specification as well as the patentee’s sales literature recommended disposal;²⁹⁰ the inner container itself was marked with a warning;²⁹¹ and the patentee had evidently refused to deal with hospitals suspected of having reused the containers.²⁹²

An analysis in terms of component spentness—and particularly in terms of component useful life—would seem to lead straightforwardly to a conclusion that the replacement of the inner container constituted permissible repair. The patentee’s own statements clearly indicated that the patentee believed that the inner container’s useful life would extend only until the container was filled, while the outer container could last indefinitely.²⁹³

Yet the useful life standard left open another avenue of attack for the patentee. *Sage Products* pointed out that the useful life of the inner container did not end when the container was full of sharps because it was physically possible (although apparently difficult and presumably risky) to clean and reuse the inner container.²⁹⁴ This seems a plausible argument, and illustrates once again how easily the useful life standard can be manipulated, yielding entirely different

286. *Id.*

287. *See id.* at 305-06 (Newman, J., dissenting) (rejecting any notion of nonphysical “effective” spentness and arguing that replacement of unworn elements amounted to impermissible reconstruction).

288. *Sage Prods., Inc. v. Devon Indus., Inc.*, 45 F.3d 1575 (Fed. Cir. 1995).

289. *Id.* at 1576-77.

290. *Id.* at 1577.

291. *Id.* The warning declared: “BIOHAZARD—SINGLE USE ONLY.” *Id.*; *see supra* note 224 and accompanying text (discussing *Cotton-Tie*, which involved a similar label on the patented goods at issue in which the Court concluded that the defendant reconstructed the patented goods).

292. *Sage Products*, 45 F.3d at 1577.

293. *Id.*

294. *Id.* at 1578.

outcomes depending upon whether the court chooses to characterize useful life in terms of safe practices of physical capacity.

Unfortunately, the court persisted in attempting to adapt the component spentness rationale. The court dismissed as insignificant the fact that it might be physically possible to clean and reuse the inner container; prudence (and the patentee's own admonitions) counseled otherwise.²⁹⁵ To square this prudential concern with the notion of component spentness, the court reached for a notion of "effective" spentness: "This court has never said that an element is spent only when it is impossible to reuse it. Like the district court, we believe that when it is neither practical nor feasible to continue using an element that is intended to be replaced, that element is effectively spent."²⁹⁶

"Effective" spentness reared its head again in a case factually similar to *Sage Products*. In *Kendall Co. v. Progressive Medical Technology, Inc.*,²⁹⁷ the claims concerned a medical device used for applying pressure to a patient's limbs.²⁹⁸ The device included a pump, pressure sleeves (designed to be wrapped around the patient's limbs), and tubes connecting the pump and the sleeves.²⁹⁹ The patentee instructed users, through a warning label on its packaging,³⁰⁰ against reusing the sleeves, because the sleeves could become contaminated through direct contact with the patient's skin.³⁰¹ The patentee objected to the defendants' sale of replacement sleeves on the ground that it was physically possible to use the sleeves for about three years or more before they became worn out.³⁰²

Unfortunately, rather than capitalize on the opportunity to explain the limitations of the component spentness approach to permissible repair, the court simply viewed this case as a rerun of *Sage Products*.³⁰³ Indeed, perhaps without realizing it, the court spoke in

295. *Id.* ("It might be prudent to replace an expendable element before it has been completely exhausted.")

296. *Id.* (citing *Everpure, Inc. v. Cuno, Inc.*, 875 F.2d 300, 303 (Fed. Cir. 1989)).

297. 85 F.3d 1570 (Fed. Cir. 1996).

298. *Id.* at 1571.

299. *Id.* at 1571-72.

300. Like the label at issue in *Sage Products*, this label warned: "FOR SINGLE PATIENT USE ONLY. DO NOT REUSE." *Id.* at 1572.

301. *Id.*

302. *Id.*

303. Although the patentee attempted to distinguish *Sage Products* by emphasizing that the patent specification in that case had expressly instructed users to dispose of the inner container, while its own patent specification was silent on whether disposing of the sleeve after a single use was prudent, the court rejected this hair-splitting distinction: "A purchaser may repair or replace *any* unpatented component that wears out or otherwise be-

terms that seem impossible to square with a notion of component spentness:

[A]s long as reconstruction does not occur or a contract is not violated, nothing in the law prevents a purchaser of a device from prematurely repairing it or replacing an unpatented component. Premature repair is the business of the purchaser of the product, who owns it, rather than the patentee, who sold it.³⁰⁴

The lesson to be drawn from these cases is that the useful life criterion, like other spentness criteria, seems most productive when it serves the modest role of indicating the patentee's and purchaser's intentions. In retrospect, the underlying concern with reasonable expectations can be glimpsed in a number of the more satisfactory useful life cases. For example, in *Heyer v. Duplicator Manufacturing Co.*,³⁰⁵ Justice Holmes made this plain: "The owner when he bought one of these machines had a right to suppose that he was free to maintain it in use, without the further consent of the seller, for more than the sixty days in which the present gelatine might be used up."³⁰⁶ Justice Holmes seemed to recognize that his analysis differed fundamentally from an assessment of inherent physical and functional characteristics of a patented device. His analysis was a filter for intent—an analysis that sounded, perhaps, in contract. As Justice Holmes stated, "We have only to establish the *construction of a bargain* on principles of common sense applied to the specific facts."³⁰⁷

Other courts that have applied *Heyer* seemed to understand that its analysis really centered on intent and only indirectly dealt with the characteristics of the device.³⁰⁸ In *El Dorado Foundry, Machine & Supply Co. v. Fluid Packed Pump Co.*,³⁰⁹ the patent claimed a pump for use in connection with an oil rig, and the defendant supplied certain re-

comes 'spent,' whether or not the patentee believed at the time the patent application was filed that it would be necessary to do so." *Id.* at 1575.

304. *Id.* It is difficult to know what to make of this announcement because it presupposes the conclusion that "reconstruction does not occur."

305. 263 U.S. 100 (1923); see *supra* notes 236-241 and accompanying text.

306. *Heyer*, 263 U.S. at 101-02.

307. *Id.* at 102 (emphasis added).

308. At least one case that preceded *Heyer* similarly concentrated on intent. See *Farrington v. Board of Water Comm'rs*, 8 F. Cas. 1086, 1088 (C.C.E.D. Mich. 1870) (No. 4687) (arguing that, under *Simpson*, permissible repair depends on whether the parts were temporary in relation to the whole machine, and that this, in turn, requires that the nature of the parts "must have been so understood by the inventor in selling and the purchaser in buying the machine").

309. 81 F.2d 782 (8th Cir. 1936).

placement parts for the pump.³¹⁰ Drawing heavily from *Heyer*, the *El Dorado* court found permissible repair because the parts of the pumps replaced by the defendant were those that wore out quickly, and because the patentee contemplated that this would occur.³¹¹ The decision of the Tenth Circuit in *Williams v. Hughes Tool Co.*³¹² reflects a similar interpretation of *Heyer*.³¹³ Collectively, these cases suggest that useful life is a helpful factor in distinguishing repair from reconstruction, especially when it is focused on eliciting the underlying intentions of the parties.

D. *The Dominance Test*

A final "spentness" approach to the repair-reconstruction dichotomy is the "dominance" of components test. The dominance test as it appears in cases such as *Automotive Parts Co. v. Wisconsin Axle Co.*³¹⁴ can be viewed as an early effort to implement the overall spentness standard. The dominance test stresses "the relation of the two classes of parts—those supplied and those remaining in the original construction—to the patented unit."³¹⁵ In making this comparison:

if the new parts so dominate the structural substance of the whole as to justify the conclusion that it has been made anew, there is a rebuilding or reconstruction; and conversely, where the original parts, after replacement, are so large a part of the whole structural substance as to preponderate over the new, there has not been a reconstruction but only repair.³¹⁶

310. *Id.* at 783-84. The patent included claims to the pump itself and to a plunger subassembly for the pump, but it appeared that the defendant did not supply replacement parts that would allow reconstruction of the plunger assembly. *Id.* at 783.

311. *Id.* at 785-86. The patentee's contemplation of this result was evidenced by statements in the patentee's advertisements, which specified in some detail "[w]hen to [r]eplace [t]ubes." *Id.*

312. 186 F.2d 278 (10th Cir. 1950).

313. The court stated:

Where a patented device of long life has among its integrated elements a part which, as a result of use of the device, quickly wears out and, therefore, is temporary in duration, and the patentee licenses the use of the device, it will be presumed that the patentee and the licensee contemplated and intended that such temporary part would be replaced by the licensee and that replacing it would constitute permissible repair and not reconstruction amounting to infringement of the patent.

Id. at 282.

314. 81 F.2d 125 (6th Cir. 1935).

315. *Id.* at 127.

316. *Id.*

The court recognized that its test would entail more than mere parts counting, but did not make clear what other considerations (for example, the importance of the component in overall combination functionality, or the relative cost of the component) would be germane.³¹⁷ Moreover, because the court remanded the case to be decided under the test it had set forth, it did not have the occasion to apply this test.³¹⁸

Courts were not quick to embrace the dominance test.³¹⁹ Indeed, after *Aro I*'s rejection of the multifactor test and apparent rejection of approaches to repair-reconstruction that focused on individual components of the overall combination, some courts claimed that the dominance test had been overruled. For example, in *National-Standard Co. v. UOP, Inc.*,³²⁰ the defendant sold replacement sieves for plaintiff's patented "apparatus for classifying fine-grain solids in wet conditions," used to draw off solid particles from coal slurries.³²¹ After observing that the sieve was merely "one of three elements in the patented combination,"³²² the court rejected the argument that the replacement sieve so dominated the overall combination as to justify a conclusion of reconstruction.³²³ Finally, the court noted that *Aro I* had rejected similar arguments.³²⁴

317. *Cf. id.* (noting that the difficulties of the dominance test spring from "the necessity of determining which of the two classes of parts, those supplied or the remaining original parts, dominates the structure as a whole").

318. *Id.* at 128; see *Timken-Detroit Axle Co. v. Automotive Parts Co.*, 93 F.2d 76, 76 (6th Cir. 1937) (affirming the district court's finding upon remand of permissible repair on the ground that the replacement parts at issue (a gear pair and a half-axle) did not so dominate the structure of the overall combination (an axle) as to make it a new structure).

319. Indeed, only a single case preceding the Federal Circuit era can be found in which a court relied even in part on the dominance test. See *Standard Stoker Co. v. Berkley Mach. Works & Foundry Co.*, 29 F. Supp. 349, 373-75 (E.D. Va. 1938) (citing *Automotive Parts* for the dominance test), *aff'd*, 106 F.2d 475 (4th Cir. 1939).

320. 616 F.2d 339 (7th Cir. 1980) (per curiam).

321. *Id.* at 339-40.

322. *Id.* at 340.

323. *Id.* at 340-41.

324. *Id.* at 341. The plaintiff in this case, relying on *Automotive Parts*, had argued that the sieve was a dominant component. *Id.* at 340. While this argument seems similar to the "heart of the invention" test rejected by *Aro I*, see *supra* text accompanying note 162, it differs because the dominance test, presumably, could take into account considerations such as the number of replaced components (as a percentage of the overall combination) and their cost and functional importance. See also *Porter v. Farmers Supply Serv., Inc.*, 790 F.2d 882, 886 n.5 (Fed. Cir. 1986) (casting doubt on the dominance test in light of *Aro I*). But see *Wilbur-Ellis Co. v. Kuther*, 377 U.S. 422, 424 (1964) (arguably invoking the dominance test by including in its analysis the fact that "six of the 35 elements of the combination patent were resized or relocated"); Comment, *Repair and Reconstruction of Patented Combinations*, 32 U. CHI. L. REV. 353, 359 (1965) (suggesting that *Aro I* might be interpreted as adopting a dominance approach).

Notwithstanding this interpretation of *Aro I*, subsequent courts, including the Federal Circuit, have continued to wrestle with the implications of a "dominance" approach to overall spentness. One case that goes far towards demonstrating the ultimate futility of the dominance analysis is the Court of Claims' decision in *General Electric Co. v. United States*.³²⁵ The case involved the refurbishing of patented gun mounts used on Navy vessels.³²⁶ The gun mounts were removed from their vessels and shipped to a Navy-operated replacement facility, where the components were disassembled and sent to separate work stations for inspection, cleaning, and replacement, if necessary.³²⁷ However, when the components were reassembled, there was no attempt to reunite the original components of any given gun mount, nor was there any effort to ensure that a given gun mount was returned to the vessel from which it was originally taken.³²⁸

Both the trial judge and the appellate tribunal applied a variety of spentness analyses, all to little effect.³²⁹ The trial judge focused on useful life, reasoned that the useful life of the gun mounts was voluntarily ended—rendering the gun mounts "spent" overall—when the Navy disassembled the gun mounts, and concluded that the Navy had engaged in impermissible reconstruction.³³⁰ The appellate tribunal reversed,³³¹ basing its analysis on a variation on the dominance approach.³³² Attempting to determine whether the new components dominated the original components for any given gun mount would have been impossible; no individual gun mount maintained its identity during the process.³³³ Instead, the court sidestepped the riddle of the apocryphal axe and resorted to averages: On average, of seventeen components in the gun mount, the patentee had supplied spare parts for at least fifteen, suggesting that in any average gun mount, the

325. 572 F.2d 745 (Ct. Cl. 1978) (en banc) (per curiam).

326. *Id.* at 779-82.

327. *Id.* at 780. Some of the replacement parts came from gun mounts that had been scrapped and cannibalized for a spare parts pool. *Id.*

328. *Id.*

329. *See id.* at 781-82 (applying a dominance analysis); *General Elec. Co. v. United States*, 191 U.S.P.Q. (BNA) 594, 621 (Ct. Cl. 1976) (employing a useful life analysis), *modified*, 572 F.2d 745 (Ct. Cl. 1978) (en banc) (per curiam).

330. *General Electric*, 191 U.S.P.Q. (BNA) at 621.

331. *General Electric*, 572 F.2d at 786 (dismissing the petition).

332. The court also employed a fractional cost approach. The court attributed significance to the fact that the refurbishing activity cost, on average, only about \$100,000, while the value of the overall combination was roughly \$1 million. *Id.* at 782.

333. *Id.* at 780.

dominant components would be authorized components from the patentee, and that the overhauling was a permissible repair.³³⁴

One might reasonably ask whether parts counting, or even the contrived average parts counting of the variety employed in *General Electric*, is an efficient means for determining the scope of the purchaser's permissible repair right. Dominance as applied in *General Electric* is cumbersome and ultimately highly artificial. And to what end does it really go? If the court is attempting to preserve the purchaser's reasonable expectations in use of the patented goods, does parts counting really serve this end? Even if it does, are there not more direct ways to get at the purchaser's reasonable expectations?

These questions remain open in Federal Circuit jurisprudence. The Federal Circuit relied on *General Electric* to avoid another potential confrontation with the apocryphal axe in *Dana Corp. v. American Precision Co.*³³⁵ The patent concerned clutch assemblies, and, as in *General Electric*, the replacement activities entailed production line disassembly and rebuilding of used clutches.³³⁶ The Federal Circuit, like its predecessor court, rejected the argument that the clutches became spent upon being disassembled.³³⁷

The patentee in *Dana* also proposed an "economic" approach to the dominance test.³³⁸ This approach called for the court to find overall spentness "when a user, making an objective economic decision, would replace the product rather than repair it, because it has no value to the owner except as scrap."³³⁹ While the *Dana* patentee suggested that the economic analysis would yield more predictable outcomes in repair-reconstruction cases, the Federal Circuit was not persuaded to adopt the approach.³⁴⁰ First, the court seemed unconvinced that the analysis would indeed enhance predictability.³⁴¹ Sec-

334. *Id.* at 783-84.

335. 827 F.2d 755 (Fed. Cir. 1987).

336. *Id.* at 756-57.

337. *Id.* at 760. Although the court did not make it clear, a dominance approach of the *General Electric* type apparently would have revealed that in an average rebuilt clutch assembly, only four parts out of many parts were new—a fact similar to those in *General Electric*. See *id.* at 757.

338. *Id.* at 760.

339. *Id.* Presumably, this economic evaluation could involve a consideration of the value of the replaced parts as compared to the value of the overall combination.

340. See *id.* (acknowledging that this approach was interesting, but rejecting it on the ground that it entailed as much uncertainty as existing case law).

341. *Id.* The court stated that truck owners might decide to replace the patented clutch assembly, rather than repairing it, merely because the replacement might more quickly enable the truck driver to return to the road. *Id.* That decision, according to the court, "rests little, if at all, on the owner's objective view of the defective clutch's condition." *Id.* But this seems to miss the point of substituting an economic analysis, which is to allow the

ond, the court seemed to think that the analysis departed from the "guidelines laid down in *Aro I* and its progeny," which, of course, the court considered itself bound to follow.³⁴²

The "economic" approach to overall spentness fared no better in a British case, *Solar Thomson Engineering Co. v. Barton*.³⁴³ The court expressly rejected proposed alternative tests that would have called for a comparison of (1) "the relative values of what has been replaced and the rest of the patented article" or (2) "the relative cost of carrying out the alleged repair and of making the complete article anew."³⁴⁴ Quite sensibly, the court reasoned that a purchaser should be entitled to carry out repair activities whether or not they are economical.³⁴⁵ Having rejected the proffered test, however, the court could do little more in formulating its own test than to restate the broad inquiry: "The cardinal question must be whether what has been done can fairly be termed a repair, having regard to the nature of the patented article."³⁴⁶

The most thorough exploration of the dominance approach—and, likewise, the most dramatic illustration of the ultimate impracticability of reliance on spentness standards—appears in the district

court to escape the confines of a strictly device-oriented approach to spentness. If both the patent owner and the customer would reasonably have expected this pattern of replacement, then it presumably would be reflected in the price of the patented product and a court would be fully justified in concluding that the implied license to repair did not extend to clutch replacement.

342. *Id.* It is difficult to see why economic analysis should stand on any shakier ground than does the parts-counting approach to dominance. Both the economic analysis and the parts counting are ways to assess overall spentness, just as *Aro I* requires.

343. [1977] R.P.C. 537, 554-57 (1977).

344. *Id.* at 555.

345. *Id.* The court also rejected a component importance criterion, stating that the purchaser should have the right to repair whether or not the replaced part "is crucial to the function of the patented article." *Id.*

346. *Id.* Yet another proposal that is based upon an economic calculation—although not one devoted to a notion of component dominance—would provide that a replacement activity constitutes reconstruction only "when the patentee could reasonably have made the sale of a whole unit if no parts were available." Comment, *Combination Patents: The Right to Prohibit Sales of Replacement Parts*, 70 YALE L.J. 649, 660 (1965). This reasoning is derived from a consideration of *Mercoind Corp. v. Mid-Continent Investment Co.*, 320 U.S. 661 (1944), and the language of 35 U.S.C. § 271(d) (the patent misuse provision), and their effect on the patentee's ability to control the replacement part market through express license restrictions. Comment, *supra*, at 658-60. But this preoccupation with *Mid-Continent* and patent misuse in the repair-reconstruction context seems a bit like allowing the tail to wag the dog. This test, like so many others used in this area, works best if considered within the context of the parties' probable intentions. If the purchaser would reasonably purchase a new unit rather than attempt to repair the old when a component breaks or wears out, then the purchase price of the original goods presumably reflected that understanding, and the patentee will be undercompensated if the purchaser is entitled to extend the life of the original goods without payment to the patentee.

court and Federal Circuit decisions in *FMC Corp. v. Up-Right, Inc.*³⁴⁷ FMC, which held a patent on a grape picking head, sued Up-Right, which sold a so-called "Rotary Pulsator" grape picking head in competition with FMC.³⁴⁸ In prior litigation, FMC prevailed and the parties settled.³⁴⁹ Consistent with the settlement agreement, Up-Right ceased its sales of Rotary Pulsator heads, but Up-Right continued to sell replacement parts to customers who previously had purchased Rotary Pulsator heads.³⁵⁰ FMC alleged that the customers were engaging in impermissible reconstruction; Up-Right countered that the customers were permissibly repairing.³⁵¹

Reviewing the law of repair and reconstruction through *Dana*,³⁵² the FMC district court declared that *Dana* had rejected the "economic analysis" for overall spentness and had commanded instead that the dominance test be used.³⁵³

The patent owner FMC recognized that if the court applied the dominance test on a straightforward parts-counting basis, its case for dominance would be weak, because Up-Right had never replaced a majority of the parts in any given head in the course of any individual servicing.³⁵⁴ Attempting to circumvent this problem, FMC argued that the court was entitled to consider the aggregation of replacement activities occurring over time for each Rotary Pulsator head.³⁵⁵ The facts showed that, as the customer periodically replaced parts, the total number of replacement parts would increase relative to the total number of parts, so that eventually the number of replacement parts

347. 21 F.3d 1073 (Fed. Cir. 1994); 816 F. Supp. 1455 (N.D. Cal. 1993).

348. *FMC*, 816 F. Supp. at 1457.

349. *Id.*

350. *Id.* at 1458.

351. *Id.*

352. *Dana Corp. v. American Precision Co.*, 827 F.2d 755 (Fed. Cir. 1987).

353. *FMC*, 816 F. Supp. at 1463. The court noted:

Dana seems to hold that the "spendness" of a product is to be determined by "examination of its physical characteristics," rather than consideration of the owner's subjective evaluation of value.

Thus, determination of whether the original patented combination has become spent must be made by reference to the physical condition of the combination taken as a whole. This was the approach of the court in *Automotive Parts Co. v. Wisconsin Axle Co.* . . .

Id. While the District Court's characterization of *Dana* may be sound, it is not at all clear that the *Dana* court accepted the *Automotive Parts* dominance test. See *Dana*, 827 F.2d at 758-60 (omitting any reference to *Automotive Parts* or the test articulated therein).

354. *FMC*, 816 F. Supp. at 1464.

355. *Id.*

would exceed fifty percent in satisfaction of the dominance criterion.³⁵⁶

The argument exposes a fundamental weakness in the dominance approach to overall spentness. As the district court recognized, if the dominance approach ignored the aggregated effect of sequential replacement activities, an owner could extend the life of a patented combination indefinitely without ever “reconstructing” the combination; he would need merely to be certain that no more than half the parts were replaced during any given servicing.³⁵⁷ Every part in the device ultimately could be replaced without a finding of reconstruction. This presented the philosophical riddle of the apocryphal axe: “At some point, the overhauled device will resemble the apocryphal axe, of which the owner brags: ‘This is my great-grandfather’s original axe, although the handle has been replaced five times, and the head twice.’”³⁵⁸

Despite this problem, *Aro I* seems to command expressly that the overall spentness analysis ignore the aggregated effect of sequential replacement activities.³⁵⁹ The *FMC* district court found that, despite the apparent command from *Aro I*, there would be some point in time where sequential replacement activities would rise to the level of reconstruction.³⁶⁰ However, the *FMC* court found it unnecessary on the facts before it to determine exactly at which point in time that would occur, because Up-Right’s replacement activities did not even meet the minimum threshold at which “the invention as a whole . . . at some specified time [has] outlived its usefulness and [is] ready for the scrapheap.”³⁶¹ Although the *FMC* court did not reach the issue of whether replacement activities aggregated over time would constitute reconstruction,³⁶² it nevertheless provided a thoughtful analysis of this position out of “an excess of caution.”³⁶³

356. *Id.* at 1464-65.

357. *Id.* at 1464.

358. *Id.* at 1464 n.15.

359. *See id.* at 1464 (stating that “[m]ere replacement of individual unpatented parts, one at a time, whether of the same part repeatedly or different parts successively, is no more than the lawful right of the owner to repair his property” (quoting *Aro Mfg. Co. v. Convertible Top Replacement Co.*, 365 U.S. 336, 346 (1961))). *See supra* note 129 and accompanying text for a discussion of this language in context in *Aro I*.

360. *See FMC*, 816 F. Supp. at 1464 (observing that “[t]here is considerable intuitive appeal to the argument that, at some point, successive replacement of every part in a device will result in the creation of a new device for purposes of infringement”).

361. *Id.* In arriving at this conclusion, the court seemed to be guided both by the small number of replaced parts relative to the total number of parts, and by the low replacement parts cost (about \$900 annually) relative to the cost of the head (\$30,000). *Id.*

362. *Id.*

363. *Id.* at 1465.

Here again, the analysis demonstrates the ultimate futility of a device-oriented, dominance approach to overall spentness. First, as the district court clearly appreciated, a pure parts-counting approach, in which anything that is identifiable as an individual "part" is given equal weight with any other identifiable "part," can too easily be manipulated to achieve untoward results. For example, FMC sought to count two rails on the picking heads as two parts, while the entire drive means of the picking head as only one.³⁶⁴ This would be much like asserting that an improved six-cylinder engine was composed of seven parts—the engine and six spark plugs, so that replacement of all of the spark plugs would be considered replacement of a majority of the parts of the combination, and would constitute reconstruction.³⁶⁵

Second, even an approach that seeks to incorporate component value (relative to the overall value of the combination) presents difficult choices. Should component value be based upon cost or retail price?³⁶⁶ If these methods yield different results, what is the basis for choosing between them? The question is difficult to resolve precisely because the dominance inquiry, elaborated at this level, seems completely cut loose from its foundation. The problem is that the dominance inquiry encourages courts to think of the repair-reconstruction problem in terms of spentness rhetoric without pausing to consider how and whether that rhetoric is connected to the fundamental underlying expectations of the parties.³⁶⁷

364. *Id.*

365. *Id.* There are other examples of the potential absurdity of the parts-counting approach to overall spentness. See *Westinghouse Elec. & Mfg. Co. v. Hesser*, 131 F.2d 406, 410 (6th Cir. 1942) (noting that it would be "a fruitless task to determine when, in the replacement of useless parts in a given [patented combination], the new would dominate the old" because "some of the replaced units would themselves need replacing before other original units failed" and because "considerations of quantities, relative weights, and costs, are of little aid on the question of domination"); *Morrin v. Robert White Eng'g Works*, 143 F. 519, 520 (2d Cir. 1905) (arguing that the replacement of a single generating tube within a steam generator would constitute repair, and the replacement of an entire series of tubes would constitute reconstruction, but that "[b]etween these two extremes lies a debatable ground, the precise limits of which cannot be determined in advance").

366. See *FMC*, 816 F. Supp. at 1465-66 (rejecting the patentee's computation of the percentage value of replaced parts as 97%, recalculating this percentage as less than 50% on both the cost and retail bases, yet concluding that even these recalculations overstate the percentage by failing to consider "the economics of scale in producing parts for initial manufacture, and the increased overhead attendant with inventorying and selling individual parts").

367. The district court in *FMC* also considered a "hybrid" approach to the component value question in which certain parts were chosen as "integral," and a percentage value of replaced integral parts was computed. *Id.* at 1466-67. It is difficult to understand how this approach could square with *Aro*'s proscription against considering the "heart of the invention." See *supra* note 162 and accompanying text.

Reviewing the district court's exhaustive analysis, the Federal Circuit confirmed that the lower court need not have reached the question of the aggregation of sequential replacement activities.³⁶⁸ The determination that no single instance of replacement itself constituted reconstruction was sufficient to resolve the case in favor of the defendants on the authority of *Aro I*'s express language.³⁶⁹ Moreover, a dominance test that did take into account the aggregate effect of sequential replacement would not only contravene *Aro I*, but would also be "unworkable from a practical standpoint" because the owner of the patented product would need to have a precise record of the product's repairs in order to know when the purchaser's activities had exceeded the fifty percent threshold.³⁷⁰ Finally, the court echoed *Dana*'s rejection of an "economic" approach to overall spentness.³⁷¹

The Federal Circuit's opinion in *FMC* leaves the dominance analysis in an intolerable state.³⁷² Despite the mandate from *Aro I* to analyze overall spentness, the Federal Circuit has rejected not only the economic analysis proffered in *Dana*, but also the parts-counting dominance analysis of cases such as *Automotive Parts*.³⁷³ While the court in *FMC* takes refuge in the oft-repeated statement that the repair-recon-

368. *FMC Corp. v. Up-Right, Inc.*, 21 F.3d 1073, 1078 (Fed. Cir. 1994).

369. *See id.* at 1077 n.6 (defining a "single instance of repair" as the replacement of "one or more parts" carried out "at the same time as part of the same servicing"); *id.* at 1077 (noting that, in light of the rule that "[m]ere replacement of individual unpatented parts, one at a time . . . is no more than the lawful right of the owner to repair his property," this case did not present the "difficult issue of how much repair to a grape harvester made altogether at any single point in time would have risen to the level of reconstruction of a 'spent' grape harvester" (quoting *Aro Mfg. Co. v. Convertible Top Replacement Co.*, 365 U.S. 336, 346 (1961))).

370. *Id.* at 1078 n.7.

371. *See id.* at 1078 n.8 (counseling that "caution should be exercised in any analysis involving placing values, economic or otherwise, on the elements of a patented combination" (citing *Dana Corp. v. American Precision Co. Inc.*, 827 F.2d 755, 760 (Fed. Cir. 1987))).

372. At least one commentator reviewing *FMC* has proposed an alternative approach. *See* Thomas A. Polcyn, Note, *FMC Corporation v. Up-Right, Inc.: Sequential Replacement of Parts Does Not Turn Permissible Repairs into Impermissible Reconstruction*, 14 ST. LOUIS UNIV. PUB. L. REV. 269, 286 (1994) (proposing a test that would consider whether, "but for a series of replacements, the entity viewed as a whole would have become spent," and measuring spentness by the "conventional useful life" of the patented device). While the author correctly points out that this test might be free of the "accounting imponderables" that plagued the court in the *FMC* case, *id.* at 287, the test restates the overall spentness standard in terms of "conventional useful life," without giving any guidelines as to how conventional useful life would be calculated. In addition, the infirmities of the useful life standard are significant. *See supra* Part II.C.2. A more attractive proposal would identify conventional useful life as a factor that might have informed the reasonable expectations of the patentee or the purchaser at the time of purchase. *See infra* note 402 and accompanying text.

373. *See supra* notes 370-371 and accompanying text.

struction problem must be resolved on a case by case basis, this gives scant comfort, especially because *FMC* sidestepped the difficult question of sequential replacement.

It should be evident that the riddle of the apocryphal axe will inevitably arise in sequential replacement cases like *FMC*, so long as the analysis revolves around spentness notions. The *FMC* case thus presented the perfect vehicle for challenging the assumption that spentness should be the dominant rubric for repair-reconstruction. *FMC* aptly encapsulated the infirmities lying beneath the surface of many of the various types of spentness cases. It is unfortunate that the Federal Circuit allowed the opportunity to pass without giving serious consideration to an alternative model for repair-reconstruction that does not commit itself so thoroughly to the peculiarities of particular patented devices and the attendant obstacles posed by the "apocryphal axe."

III. MIRACLE PLUGS, RUBBER RIVET RELOADS, AND THE ROLE OF INTENT IN THE REPAIR-RECONSTRUCTION ANALYSIS

This Article has suggested that the major failing of the spentness rhetoric employed to distinguish repair from reconstruction is that it encourages courts to consider the physical qualities of the subject devices in a vacuum, rather than considering those qualities as a proxy for the underlying expectations of the patent owner and purchaser. That the expectations of the parties are fundamental to the correct resolution of the repair-reconstruction problem is a notion that is developed in the remaining parts of this Article. In this part, the Article considers the role intent has played in the repair-reconstruction cases to date.

Wilson v. Simpson unquestionably left open the possibility that courts should consider the expectations of both the patentee and the purchaser in distinguishing repair from reconstruction.³⁷⁴ Of course, this could also be said for a multitude of other potential considerations.³⁷⁵ In any event, early courts routinely made reference to the intent of the patentee and the purchaser. Typically, courts recited the "reasonable intention of the parties" as one factor in a multifactor approach to repair-reconstruction,³⁷⁶ or made some reference to whether the replacement activity comported with the "implied under-

374. See *Wilson v. Simpson*, 50 U.S. (9 How.) 109, 125 (1850) (noting that the law permits replacement of certain parts that "the inventor contemplated would have to be frequently replaced").

375. See *supra* Part I.B.1 (discussing the ambivalence of *Simpson*).

376. *Goodyear Shoe Mach. Co. v. Jackson*, 112 F. 146, 150 (1st Cir. 1901).

standing" of the parties³⁷⁷ or was "contemplated by the patentee and purchaser and user."³⁷⁸ The Supreme Court itself has spoken of the repair-reconstruction distinction in terms of establishing "the construction of a bargain."³⁷⁹

Aro I, with its rejection of a multifactor approach and its apparent adoption of an overall spentness standard, created confusion concerning the role of intent in the repair-reconstruction analysis. The Court's opinion did not address the role of intent specifically, but Justice Black insisted that "[d]eciding whether a patented article is 'made' does not depend on . . . what the patentee's or a purchaser's intentions were."³⁸⁰ Indeed, Justice Black was convinced that "the scope of a patent should never depend upon a psychoanalysis of the patentee's or purchaser's intentions, a test which can only confound confusion."³⁸¹ Yet Justice Brennan, concurring in the result, was equally convinced that the appropriate factors to be considered include "the common sense understanding and intention of the patent owner and the buyer of the combination as to its perishable components."³⁸²

377. *Shickle, Harrison & Howard Iron Co. v. St. Louis Car-Coupler Co.*, 77 F. 739, 742 (8th Cir. 1896); *see also* *Electric Auto-Lite Co. v. P. & D. Mfg. Co.*, 78 F.2d 700, 704 (2d Cir. 1935) ("In selling its ignition apparatus, the plaintiff did so expecting the car owner to have service during the life of the car and upon the implied understanding that the car owner is entitled to repair the same by replacing parts."); *Ideal Wrapping Mach. Co. v. George Close Co.*, 23 F.2d 848, 851-52 (D. Mass.) (noting the absence of any "implied representation" that the patented device could be modified to wrap different size products), *aff'd*, 29 F.2d 533 (1st Cir. 1928).

Courts typically have intertwined notions of intent with device-centered rhetoric. *See Electric Auto-Lite*, 78 F.2d at 704 ("Indeed, the ignition apparatus is so designed and built as to make it possible to quickly and simply detach, for replacement purposes, the parts referred to and thus to meet the demands of wear or destruction."); *F.F. Slocomb & Co. v. A.C. Layman Mach. Co.*, 227 F. 94, 99-100 (D. Del. 1915) (carrying out the repair-reconstruction analysis "in view of the character of the repair parts and of the attitude of the parties toward them," and noting that the replaced parts were "intended to be replaced from time to time"), *aff'd*, 230 F. 1021 (3d Cir. 1916); *supra* notes 306, 308, 311 and accompanying text.

378. *Wagner Typewriter Co. v. F.S. Webster Co.*, 144 F. 405, 416 (C.C.S.D.N.Y. 1906). In addition to inferring intent from the design features of the patented devices, courts have also found the patentee's sales materials to be a fruitful source of evidence on intent. *See El Dorado Foundry, Mach. & Supply Co. v. Fluid Packed Pump Co.*, 81 F.2d 782, 786 (8th Cir. 1936) ("That the replacement of worn tubes is regarded by the [patentees] as a repair only is shown by the statement in their catalogue . . ."); *Morrin v. Robert White Eng'g Works*, 143 F. 519, 520-21 (2d Cir. 1905) (noting that "[t]he necessity for repairs and the right to make them is recognized in the [licensee's] catalogue").

379. *Heyer v. Duplicator Mfg. Co.*, 263 U.S. 100, 102 (1923).

380. *Aro Mfg. Co. v. Convertible Top Replacement Co.*, 365 U.S. 336, 354 (1961) (Black, J., concurring).

381. *Id.* at 355.

382. *Id.* at 364 (Brennan, J., concurring).

Two appellate decisions delivered in short succession after *Aro I* illustrate quite plainly that courts took no clear signal from *Aro I* on the proper role of intent. In *Fromberg, Inc. v. Thornhill*,³⁸³ the patentee, Fromberg, sold a tire repair device comprised of a hollow metal tube and a cylindrical rubber plug that could be discharged from the tube into a hole in a punctured tire, leaving an empty metal tube when the operation was completed.³⁸⁴ The defendant sold the "Miracle Plug," a tapered rubber plug sized to fit into an empty Fromberg tube.³⁸⁵

In analyzing whether defendant's customers were repairing or reconstructing the Fromberg combination, the court acknowledged the command from *Aro I* that the inquiry focus on overall spentness.³⁸⁶ Although this command seemed to make it "essential" for the court "to examine the Fromberg device to determine its function and purpose," the court moved directly to the proposition that the examination of the device was merely a proxy for intent: "The principal point of this inquiry is whether, when sold by the Patentee, it is reasonably contemplated that the device will be repeatedly used."³⁸⁷ The court, with little analysis, concluded that the device was designed, manufactured, sold, and used as a "unit" having "a single-shot function and purpose for a one-time use"; once the rubber plug was injected into the tire, the plug could not be used again, "[n]or is it expected that the metal tube will be."³⁸⁸ In the court's view, this brought the defendant's activities squarely within the realm of reconstruction.³⁸⁹

A panel of the Ninth Circuit flatly disagreed with this analysis in a case involving the same patent, *Fromberg, Inc. v. Gross Manufacturing Co.*³⁹⁰ In this case, the defendant purchased a complete Fromberg tube-and-plug device, sold it in a package with rubber plugs made by defendants, and specifically identified the kit as the "Rubber Rivet Reloads for use with Fromberg Cartridges."³⁹¹ The court affirmed a grant of summary judgment in favor of the defendant.³⁹²

383. 315 F.2d 407 (5th Cir. 1963).

384. *Id.* at 410.

385. *Id.*

386. *Id.* at 412.

387. *Id.*

388. *Id.* at 413.

389. *Id.*

390. 328 F.2d 803 (9th Cir. 1964).

391. *Id.* at 804.

392. *Id.*

The court made it clear that it viewed *Aro I* as treating the intent factor the same way that it had treated the “heart of the invention” factor:

We do not see how it can be maintained, under the *Aro* decision, that the intent or understanding of the patentee or licensee, or the “essence” or “heart” of the combination, is any longer controlling, at least in a case such as this, where one element of the combination is necessarily removed and finally used, while the other remains and is capable of further use.³⁹³

Thus, contrary to the Fifth Circuit’s consideration of whether the patentee had “expected” that the tube would be reused, the Ninth Circuit refused “to probe the mind of [the] patentee in order to know whether he is infringing.”³⁹⁴ But the Ninth Circuit’s analysis belies this refusal to consider intent, because the patentee’s intent, as manifested in the design of the article in question, clearly is material to the outcome of the case:

Viewing the matter objectively, that is, looking at the patent and the patented combination without adding an assumption as to what may be in the mind of the patentee, we find nothing to indicate such an expectation [that the metal tube will be used only once]. . . . [The tube] is intended to be, and is, removed from the tire, and is then capable of being reused.³⁹⁵

Plainly, the court here wanted it both ways. Subjective intent as evidenced directly—through the patentee’s own assertions, for example—was not *material*, but the patentee’s subjective intent as manifested in the design of the article was *dispositive*.³⁹⁶ This is nothing more than appellate court prejudgment of the patentee’s credibility; the appellate court seemed to believe that the patentee’s assertions as to his intent were per se incredible and so should be accorded no weight. This is troubling; either intent, however evi-

393. *Id.* at 808.

394. *Id.* at 809 (stating that “neither the desire nor the hope of the patentee in this regard either is or ought to be material, much less controlling”).

395. *Id.* The court seemed to suggest that its analysis differed from the Fifth Circuit’s analysis because that court included what was in the mind of the patentee, along with what was manifested by the design of the patented combination, while the Ninth Circuit’s analysis included only the latter. It seems equally probable, however, that the Ninth Circuit simply disagreed about what could be inferred from the design of the patented combination.

396. *See id.* (holding that the patentee’s mental desire or hope is immaterial, and then finding nothing to indicate such an intent in the patent or the patented combination).

denced, is relevant or it is not. The relative weight to be given to the evidence on intent is a matter for the trial court.

In some of its decisions the Federal Circuit has returned to pre-*Aro I* usages of the patentee's intent in the repair-reconstruction analysis. For example, in *Dana*, the court found permissible repair, pointing out that "Dana intends that its clutches be repairable; it sells repair parts and publishes a repair manual."³⁹⁷ Similarly, the court's decision in *Everpure* can perhaps best be explained as a consideration of device structure as a proxy for intent, consistent with early cases.³⁹⁸

The Federal Circuit's most recent decisions, however, inexplicably diverge on the issue of the role of the patentee's intent, and will lead to further confusion on the point.³⁹⁹ In *Aktiebolag*, the Federal Circuit proposed a multifactor test for repair-reconstruction, including as one of the factors "objective evidence of the intent of the patentee."⁴⁰⁰ The court analyzed this factor by resorting to traditional sources of circumstantial evidence of the patentee's intent:

[The patentee] did not manufacture or sell replacement drill tips. It did not publish instructions on how to retip its patented drills or suggest that the drills could or should be retipped. . . . There is, therefore, no objective evidence that [the patentee's] drill tip was intended to be a replaceable part.⁴⁰¹

The court emphasized that, while the repair-reconstruction analysis did not turn on the patentee's intent alone, "the fact that no replacement drill tips have ever been made or sold by the patentee is consistent with the conclusion that replacement of the carbide tip is not a

397. *Dana Corp. v. American Precision Co.*, 827 F.2d 755, 759 (Fed. Cir. 1987); see also *Kendall Co. v. Progressive Med. Tech., Inc.*, 85 F.3d 1570, 1575 (Fed. Cir. 1996) (inferring patentee's intent from product labeling); *Sage Prods., Inc. v. Devon Indus., Inc.*, 45 F.3d 1575, 1578 (Fed. Cir. 1995) (inferring patentee's intent from product labeling and statements in patent specification concerning disposability of component); *R2 Med. Sys., Inc. v. Katecho, Inc.*, 931 F. Supp. 1397, 1443 (N.D. Ill. 1996) (arguing that "[b]ecause these cable systems are intended to endure beyond a single use of the electrode, the structure of the electrodes and cable systems imply [the patentee's] intent that its customers will regularly replace these electrodes in normal use of the machine").

398. See *Everpure, Inc. v. Cuno, Inc.*, 875 F.2d 300, 303 (Fed. Cir. 1989) (suggesting that the fact that the patentee had sealed the filter into the filter cartridge was indicative of the patentee's intent that purchasers who replace the filter also replace the cartridge).

399. The Federal Circuit has not spoken on the reasonable expectations of the purchaser, creating the potential for additional confusion here as well.

400. *Aktiebolag v. E.J. Co.*, 121 F.3d 669, 673 (Fed. Cir. 1997), cert. denied, 118 S. Ct. 1337 (1998).

401. *Id.* at 674. The court distinguished this case from *Sage Products* and *Kendall* by noting the evidence of intent contained in those cases. *Id.*

permissible repair."⁴⁰² Surprisingly, the court made no effort to explain how its consideration of "objective evidence of intent" squared with *Aro I*. Of course, as already noted, the court likewise made no effort to explain why it was articulating the very multifactor approach that *Aro I* had explicitly denigrated.⁴⁰³

Worse still, less than a week after *Aktiebolag*, in a decision that included two panel members who also had sat on the *Aktiebolag* panel, the court took an entirely different approach regarding intent. In *Hewlett-Packard Co. v. Repeat-O-Type Stencil Manufacturing Corp.*,⁴⁰⁴ the patentee Hewlett-Packard argued expressly for adoption of an "intent-of-the-patentee" analysis, and cited traditional forms of objective evidence of its intent: its package insert suggested discarding empty cartridges (rather than refilling them with ink), and it did not sell refillable cartridges or ink refills for empty cartridges.⁴⁰⁵ But in addressing the patentee's argument that the evidence of intent was relevant on the authority of *Simpson*, the court refused to permit any deviation from a purely device-oriented spentness rhetoric:

HP has misread *Wilson*. Although at times speaking in terms of the intention of the inventor, the Court focused on the nature of the device sold, and specifically on the fact that the machine was designed such that one group of components, the knives, would wear out long before the remaining components⁴⁰⁶

While this passage appears wholly to reject the relevance of intent, this rejection is belied by other parts of the court's opinion. Attempting to harmonize its result with *Cotton-Tie* and *Mallinckrodt*, both of which involved express label restrictions on reuse of the patented product,⁴⁰⁷ the *Hewlett-Packard* court declared that evidence of intent manifested in acts of contractual significance would be relevant to the repair-reconstruction question, while lesser evidence would not be relevant:

402. *Id.* Consistent with pre-*Aro I* cases, the court tied other factors to intent in its analysis, such as the useful life of the replaced part. See *id.* (noting that the drill tip "was not intended or expected to have a life of temporary duration in comparison to the drill shank").

403. See *supra* note 113 and accompanying text.

404. 123 F.3d 1445, 1446 (Fed. Cir. 1997), *cert. denied*, 118 S. Ct. 1304 (1998).

405. *Id.* at 1453.

406. *Id.*

407. *Cotton-Tie Co. v. Simmons*, 106 U.S. 89, 91 (1882) (noting that the words "Licensed to use only once" were stamped into each metal buckle); *Mallinckrodt, Inc. v. Medipart, Inc.* 976 F.2d 700, 702 (Fed. Cir. 1992) (observing that the phrase "Single Use Only" was inscribed on each device, and that a package insert provided with each unit stated "For Single Patient Use Only").

[A]bsent a restriction having contractual significance, a purchase carries with it the right to modify as long as reconstruction of a spent product does not occur. . . . The question is not whether the patentee at the time of sale intended to limit a purchaser's right to modify the product. . . . [A] seller's intent, unless embodied in an enforceable contract, does not create a limitation on the right of a purchaser to use, sell, or modify a patented product as long as a reconstruction of the patented combination is avoided. A noncontractual intention is simply the seller's hope or wish, rather than an enforceable restriction.⁴⁰⁸

This passage indicated that the court's quarrel was with the manner in which the patentee's intent was evidenced, not with the use of intent per se. This is but another example of the court losing its way in a repair-reconstruction decision for lack of an adequate organizing principle. The fact that circumstantial evidence is a less persuasive indicator of intent does not explain why it should be impermissible to resort to such evidence. After all, if the repair-reconstruction problem is about defining the scope of an implied license, a proposition developed in the remaining parts of the Article, it is highly problematic to suggest that only express statements of contractual significance can bear on that scope.

Perhaps the court was also reacting against the possibility that the patentee's expectations alone would determine the outcome of a repair-reconstruction analysis.⁴⁰⁹ But this fear need not be addressed by throwing out all evidence of intent. Instead, the court should have recognized that its task was to balance the reasonable expectations of *both* the patentee and the purchaser of the patented goods. Viewed in this manner, it would be correct to say that evidence of the patentee's unilateral intentions should not alone govern the analysis, but incorrect to say that evidence of the patentee's unilateral expectations must be discarded.

In any event, it is critical to recognize that the exhaustion model does not facilitate analysis of the repair-reconstruction problem in terms of parties' expectations. An implied license model would be more productive for these purposes.

408. *Hewlett-Packard*, 123 F.3d at 1453; cf. Farley, *supra* note 18, at 153-56 (arguing that *Simpson* and some other repair-reconstruction cases prior to *Aro I* give some significance to intent factors, particularly the intent of the patentee).

409. See *Hewlett-Packard*, 123 F.3d at 1453 (arguing that the patentee's "unilateral intentions" cannot change the fact that it sold the cartridge at issue without restriction and that the cartridge had a useful life longer than the supply of ink that it contained).

IV. REPAIR AND RECONSTRUCTION RECONCEPTUALIZED AS A DETERMINATION OF IMPLIED LICENSE SCOPE

An "exhaustion of rights" model for the repair-reconstruction problem has historical basis, but presents a major difficulty because it thrusts the analysis towards device-oriented rhetoric and leaves the role of intent unclear. This is only to be expected because the exhaustion model focuses on whether a party's activities amount to impermissible making as opposed to permissible using, usually framed in terms of whether the device is "spent" before the replacement activities occur. In this context, the use of spentness rationales seems logical, even though it may be ill-advised.

What are the alternative models, if exhaustion has been demonstrated to be unsatisfactory? Three deserve mention, but only one—the implied license model—really presents a fundamentally different rubric from which to draw guidelines for determining what constitutes a repair or a reconstruction.

First, of course, one might simply eliminate the notion of reconstruction altogether. One commentator suggested this approach in the wake of *Aro I*.⁴¹⁰ Under this proposal, only replacement of all of the elements would trigger liability; anything less would constitute permissible repair.⁴¹¹ According to the commentator, "standard economic assumptions" may establish that the patentee is actually better off without the concept of reconstruction.⁴¹²

Whatever the force of economic arguments, expunging reconstruction would not necessarily eliminate the difficult cases. For example, sequential replacement practices might still pose a challenge. Where a purchaser replaced each component but the last screw or bolt on one day, and added the screw or bolt on the next, would this avoid liability? That is, does the standard require replacement of all components at one time before liability is triggered?

Second, one might explore an approach that is embodied in the Community Patent Convention (CPC). The CPC,⁴¹³ which has, of course, not yet come into force, defines direct infringement (Article 25)⁴¹⁴ and indirect infringement (Article 26)⁴¹⁵ in terms roughly simi-

410. Comment, *supra* note 324, at 353-54.

411. *Id.* at 363.

412. *Id.* at 364.

413. Agreement Relating to Community Patents, Dec. 15, 1989, 1989 O.J. (L 401) 1. For the complete text of the Community Patent Convention, see GERALD PATERSON, *THE EUROPEAN PATENT SYSTEM: THE LAW AND PRACTICE OF THE EUROPEAN PATENT CONVENTION* app. 19 at 714-76 (1992).

414. Article 25 ("Prohibition of direct use of the invention") provides in relevant part:

lar to corresponding provisions in U.S. patent law.⁴¹⁶ CPC Article 28 incorporates an exhaustion by sale principle, again roughly equivalent to the exhaustion doctrine of U.S. law.⁴¹⁷ Commentary on these provisions, however, suggests that they seek to define infringement "exhaustively."⁴¹⁸ Accordingly, because the right to repair is not expressly prohibited, it is absolutely protected.⁴¹⁹ It could be said, then, that the "right" to repair under the CPC is not akin to an implied license interest, and in fact not akin to a license interest at all, because it cannot be limited even by a patentee's express statement at the point of sale.⁴²⁰

At first glance, this model seems to diverge conceptually from the repair-reconstruction framework prevalent in U.S. law. Yet, in application, it seems doubtful that the differences would be very significant.

A Community patent shall confer on its proprietor the right to prevent all third parties not having his consent:

(a) from making, offering, putting on the market or using a product which is the subject-matter of the patent, or importing or stocking the product for these purposes. . . .

Agreement Relating to Community Patents, *supra* note 413, at 14.

415. Article 26 ("Prohibition of indirect use of the invention") provides in relevant part:

1. A Community patent shall also confer on its proprietor the right to prevent all third parties not having his consent from supplying or offering to supply within the territories of the Contracting States a person, other than a party entitled to exploit the patented invention, with means, relating to an essential element of that invention, for putting it into effect therein, when the third party knows, or it is obvious in the circumstances, that these means are suitable and intended for putting that invention into effect.

2. Paragraph 1 shall not apply when the means are staple commercial products, except when the third party induces the person supplied to commit acts prohibited by Article 25. . . .

Id. at 14-15.

416. 35 U.S.C. § 271(a)-(c) (1994 & Supp. 1996).

417. Article 28 ("Exhaustion of the rights conferred by the Community patent") provides that:

The rights conferred by a Community patent shall not extend to acts concerning a product covered by that patent which are done within the territories of the Contracting States after that product has been put on the market in one of these States by the proprietor of the patent or with his express consent, unless there are grounds which, under Community law, would justify the extension to such acts of the rights conferred by the patent.

Agreement Relating to Community Patents, *supra* note 413, at 15.

418. AMIRAM BENYAMINI, PATENT INFRINGEMENT IN THE EUROPEAN COMMUNITY 58-59 (Studies in Industrial Property and Copyright Law, Vol. 13, Friedrich-Karl Beier & Gerhard Schricke eds., 1993). By defining infringement exhaustively, the drafters of the CPC hoped to preclude national courts from developing national standards that might expand or contract the scope of the Community patent grant. *Id.* at 60. No correlative need for such an aggressive use of patent exhaustion principles is present in U.S. law.

419. *Id.* at 104-05.

420. *Id.* at 105.

CPC Article 25 prevents the unauthorized "making" of a claimed invention, so a court faced with an allegation that a defendant's replacement activities infringe the patent must still determine whether those activities constitute a new "making" or something less. Carrying out this exercise would seem to be very much like applying the unadorned exhaustion standard of *Aro I*. Indeed, one commentator suggests that courts might, for example, resort to a dominance test to decide the question.⁴²¹

A recent case from the U.K. Patents County Court provides an illustration of the point that decisions under the CPC model are still likely to turn on common law conceptions of repair and reconstruction. In *Hazel Grove (Superleague) Ltd. v. Euro-League Leisure Products Ltd.*,⁴²² the patentee held patents on pool tables, and the defendant refurbished and resold pool tables that had originally been purchased from the patentee.⁴²³ The court determined that it must begin its analysis by reference to CPC principles, explaining that the infringement provision in the Patents Act 1977 had been designed to correspond to Articles 25 through 28 of the Community Patents Convention.⁴²⁴

Considering these principles, the court declared that "the concept of an 'implied license' to repair is alien to the CPC, because it is based upon the idea that a purchaser needs a licence to repair a patented product and that the patentee may restrict that right."⁴²⁵ That is, because there are no rights to prohibit an activity that is less than a "making," there are no such rights to be exhausted upon sale.⁴²⁶

Yet, having reached this conclusion, the court in *Hazel Grove* immediately turned back to the common law standards for repair and reconstruction to analyze whether the defendants had engaged in a "making."⁴²⁷ Referring to British and German authority, the court found that the defendant's activities indeed constituted impermissible new "making."⁴²⁸ It is difficult to see how the analysis would have differed at all had the court merely proceeded to apply the traditional repair-reconstruction analysis.

Implied license, a third alternative model for the repair-reconstruction analysis, deserves more attention. In one sense, this is the

421. *Id.* at 112-14.

422. [1995] R.P.C. 529 (Patents County Ct.) (1995).

423. *Id.* at 531.

424. *Id.* at 537.

425. *Id.* at 539 (citing BENYAMINI, *supra* note 418, at 105).

426. *Id.*

427. *Id.* at 541-42.

428. *Id.* at 541-43.

least radical of the three alternatives. The principle, of course, is that upon the unconditional, authorized sale of patented goods, the purchaser takes a license to use (and resell) the goods. Because the license is not formalized in any express written agreement, it can be referred to as an implied license.

A number of repair-reconstruction cases refer to the concept of an implied license.⁴²⁹ In most, if not all, of these cases, the courts employed the implied license more as a convenient label than as a serious analytical tool, and there is no dramatic distinction between these cases and those employing the model of exhaustion.

If we are to take the implied license more seriously as a model for analyzing the repair-reconstruction problem, some additional precision is needed. The repair-reconstruction problem is a particular type of implied license problem. Fundamentally, it is a problem of the *scope* of an implied license: deciding that an activity constitutes "repair" is simply deciding that it falls within the scope of the purchaser's implied license, while deciding that an activity constitutes "reconstruction" is, of course, determining that the activity falls outside the properly defined scope of the license. The repair-reconstruction inquiry has, upon occasion, been framed in this manner by scholars⁴³⁰ and, albeit rarely, by judges.⁴³¹

429. See, e.g., *Hewlett-Packard Co. v. Repeat-O-Type Stencil Mfg. Corp.*, 123 F.3d 1445, 1451 (Fed. Cir. 1997) ("The question before us is whether this modification is authorized, or whether it exceeds the scope of the implied license granted to ROT and subsequent purchasers by the sale of the ink jet cartridges."), *cert. denied*, 118 S. Ct. 1304 (1998); *Aktiebolag v. E.J. Co.*, 121 F.3d 669, 672 (Fed. Cir. 1997) (reasoning that "when [patentee] sold its patented drills to its customers, it granted them an implied license to use the drill for its useful life . . . and the implied license to use includes the right to repair the patented drill" (citing *Aro Mfg. Co. v. Convertible Top Replacement Co.*, 377 U.S. 476, 484 (1964); *Standard Havens Prods., Inc. v. Gencor Indus., Inc.*, 953 F.2d 1360, 1376 (Fed. Cir. 1991))), *cert. denied*, 118 S. Ct. 1337 (1998); *Green v. Electric Vacuum Cleaner Co.*, 132 F.2d 312, 314 (6th Cir. 1942) (noting that "the license implied from sale in the usual channels of trade does not apply to a sale of an article to be scrapped" (citing *Cotton-Tie Co. v. Simmons*, 106 U.S. 89 (1882); *Tindel-Morris Co. v. Chester Forging & Eng'g Co.*, 163 F. 304 (C.C.E.D. Pa. 1908))); *Pettibone Corp. v. Fargo Mach. & Tool Co.*, 447 F. Supp. 1278, 1281 (E.D. Mich. 1978) ("[T]he purchaser is granted an implied license to use the purchased patented machine. The right to use encompasses repair but not reconstruction of the machine . . ."); *National Malleable Casting Co. v. American Steel Foundries*, 182 F. 626, 640 (C.C.D.N.J. 1910) (referring to an "implied license to make repairs").

430. See Oddi, *supra* note 3, at 102-05 (discussing *Aro I* as a "scope of implied license" case); see also Gregory M. Luck, *The Implied License: An Evolving Defense to Patent Infringement*, 16 I.P.L. NEWSLETTER 3, 29 (Fall 1997) (observing that the "scope of the implied license is oftentimes the dominant issue in cases dealing with repair versus reconstruction").

431. See, e.g., *Electric Auto-Lite Co. v. P. & D. Mfg. Co.*, 109 F.2d 566 (2d Cir. 1940) (*per curiam*). The court stated:

While in the nature of things there can be no rule as to where repair ends and reconstruction begins, clearly the implied license must be understood to cover a

What are the benefits of reconceptualizing the repair-reconstruction problem as an inquiry into the scope of an implied license? One major benefit is that, unlike the exhaustion model, the implied license model does not impel us towards spentness rationales and the complexity of device-oriented rhetoric. Instead, the implied license model gives a prominent role to the expectations of the parties.

Problems, of course, remain. Determining the scope of an implied license is no easy work. At first glance, in fact, it may seem no easier than determining the "spentness" of a component or a combination.

However, a second major benefit of the implied license model is that it is not unique to the repair-reconstruction problem, or even unique to patent law. Courts and commentators have confronted questions of implied license scope in a wide array of contexts. In the next three subparts, this Article considers teachings from these other contexts, the extent to which they reinforce what we already know to be true of the repair-reconstruction problem, and the extent to which they can be injected into the repair-reconstruction analysis by analogy. If the repair-reconstruction analysis can be enhanced by this exercise in cross-fertilization, then the shift to a rigorous notion of implied license scope is easily justified.

This Article considers analogies from three areas: first, cases and commentary on implied license scope in other intellectual property settings; second, implied license scope as developed in the law of servitudes in real property; and third, implied license scope as developed in the law of contracts.

A. *Implied License Scope in Intellectual Property Cases*

A number of patent cases explore the issue of implied license scope.⁴³² A series of cases involve the sale of unpatented goods which

reasonable enjoyment of the privilege; and if it is cheaper to insert a new part than to cobble the old one back into service, the license covers just that; if it did not, the very presupposition on which it rests would be falsified.

Id. at 567.

432. In addition to the cases discussed specifically in the text, other patent cases in which the implied license is employed involve certain types of involuntary sales and disputes over damages liability where the infringer has already satisfied a judgment for past damages. *See, e.g.*, *Union Tool Co. v. Wilson*, 259 U.S. 107, 114 (1922) (finding that the sale of spare parts "made with full knowledge of all relevant facts" where there was no implied license violated a court-ordered injunction); *McCoy v. Mitsuboshi Cutlery, Inc.*, 67 F.3d 917, 920-22 (Fed. Cir. 1995) (finding that an implied license arose upon a sale pursuant to a Texas commercial code provision that allowed the seller to sell specially ordered goods upon the buyer's refusal to pay); *King Instrument Corp. v. Otari Corp.*, 814 F.2d 1560, 1564 (Fed. Cir. 1987) (stating that upon satisfying a judgment for previously infring-

are components of a patented combination or are used to practice a patented process. For example, in *Edison Electric Light Co. v. Peninsular Light, Power & Heat Co.*,⁴³³ Edison Electric held certain exclusive rights in Edison patents concerning methods for distributing electricity. Edison had installed a wiring system in the Livingston Hotel in Grand Rapids, Michigan, and had supplied electricity to the hotel.⁴³⁴ This wiring system was connected to transformers in accordance with a patented method owned by Edison.⁴³⁵ When the hotel decided to switch to another electricity provider (Peninsular), Edison Electric sued Peninsular for contributory infringement.⁴³⁶

Based upon well-established exhaustion principles, it could not seriously be questioned that a license to use the patented method should be implied in favor of the hotel based upon its purchase of the wiring system designed to carry out the patented method.⁴³⁷ The question was whether the scope of the implied license was limited to the provision of electricity from Edison Electric.⁴³⁸ Significantly, in articulating a general rule for analyzing implied license scope, the court did not constrain itself to a consideration of the physical qualities of the patented combination at issue. Instead, it was "evident" to the court that: "[T]he extent of an implied license must depend upon the peculiar facts of each case. The question in each case is whether or not the circumstances are such as to estop the vendor from asserting infringement."⁴³⁹ In the court's view, the circumstances clearly indicated that Edison Electric intended for the hotel to have the benefits of the Edison distribution system, and the hotel clearly understood that it would be free to secure electricity from any source.⁴⁴⁰ Accordingly, the implied license was sufficient in scope to

ing the sales of machines, the defendant received an implied license extending throughout the useful life of the machines); *Sawin v. Guild*, 21 F. Cas. 554, 555 (C.C.D. Mass. 1813) (No. 12,391) (finding that an implied license arose upon sheriff's sale).

433. 101 F. 831 (6th Cir. 1900).

434. *Id.* at 831-32.

435. *Id.* at 833.

436. *Id.* at 832.

437. *See id.* at 835 (noting the general rule "that if a patentee make a structure embodying his invention, and unconditionally make a sale of it, the buyer acquires the right to use the machine without restrictions, and, when such machine is . . . unconditionally sold, no restriction upon its use will be implied in favor of the patentee" (internal quotation marks omitted) (quoting *Heaton-Peninsular Button-Fastener Co. v. Eureka Specialty Co.*, 77 F. 288, 290 (6th Cir. 1896))).

438. *Id.* at 837.

439. *Id.* at 836.

440. *Id.* at 836-37.

protect the hotel (and its new supplier of electricity) from infringement liability.⁴⁴¹

A recent Federal Circuit case, *Carborundum Co. v. Molten Metal Equipment Innovations, Inc.*,⁴⁴² endorses a totality of the circumstances approach to determining the scope of an implied license, including the reasonable expectations of the patentee and purchaser. Plaintiff Carborundum owned a patent on an apparatus for melting scrap metal, one component of which was a pump specifically designed for conveying molten metal.⁴⁴³ Carborundum sold only the pump, not the entire apparatus.⁴⁴⁴ When defendant Molten Metal also began selling molten metal pumps to Carborundum customers, Carborundum sued.⁴⁴⁵

As in *Edison Electric*, the existence of an implied license in this case could not reasonably be disputed: Under exhaustion principles, the purchasers of the Carborundum pump acquired a license to combine the pump with other elements to form the patented apparatus.⁴⁴⁶ The only question concerned the scope of this implied license. The patentee argued that the implied license extended only for the life of the purchased pump, while the defendant argued that the implied license extended without restriction, for the entire term of the patent.⁴⁴⁷

The court turned to a flexible all-circumstances approach:

We must further look to the circumstances of the sale to determine the scope of the implied license. This determination must be based on what the parties reasonably intended as to the scope of the implied license based on the circumstances of the sale. One party's unilateral expectations as to the scope of the implied license are irrelevant.⁴⁴⁸

Based upon the circumstances, the Federal Circuit concluded that the implied license extended only for the life of the pump, and the court hinted that this conclusion would be the typical outcome.⁴⁴⁹

441. *Id.*

442. 72 F.3d 872 (Fed. Cir. 1995).

443. *Id.* at 875-76.

444. *Id.* at 876.

445. *Id.*

446. *Id.* at 879.

447. *Id.* at 878-79.

448. *Id.* at 878 (citations omitted).

449. *See id.* at 879 ("Unless the circumstances indicate otherwise, an implied license arising from sale of a component to be used in a patented combination extends only for the life of the component whose sale and purchase created the license.").

Courts have also confronted implied license scope in a variety of patent cases involving litigation over the "shop right," under which an employer receives a royalty-free, nonexclusive license to use its employees' inventions where, for example, the employee has developed the invention during work hours, using the employer's facilities.⁴⁵⁰ In many of these cases, it was relatively free from doubt that the employer had some right of use in the employee's inventions, but questions arose as to the duration of the use right, or whether it extended to improvements.⁴⁵¹

Courts adjudicating implied license scope in this context again have been disinclined to rest the inquiry on a constrained set of considerations.⁴⁵² They consider all circumstances, with a particular emphasis on the reasonable intentions of the parties.⁴⁵³ A statement from an early Sixth Circuit decision is typical:

The duration and scope of a license must depend upon the nature of the invention and the circumstances out of which an implied license is presumed, and both must at last depend upon the intention of the parties.⁴⁵⁴

450. See, e.g., *Teets v. Chromalloy Gas Turbine Corp.*, 83 F.3d 403, 407 (Fed. Cir. 1996) ("[A]n employer may obtain a shop right in employee inventions where it has contributed to the development of the invention." (citation omitted)); *McElmurray v. Arkansas Power & Light Co.*, 995 F.2d 1576, 1580-81 (Fed. Cir. 1993) (discussing both the basis and application of the "shop right" between employer and employee). For the common law origins of the shop right, see, for example, *United States v. Dubilier Condenser Corp.*, 289 U.S. 178, 180, amended by 289 U.S. 706 (1933); *Gill v. United States*, 160 U.S. 426, 435 (1896); *Solomons v. United States*, 137 U.S. 342, 346 (1890); *McClurg v. Kingsland*, 42 U.S. (1 How.) 202, 210-11 (1843).

451. See, e.g., *Teets*, 83 F.3d at 409 (finding an implied-in-fact contract for an employee to assign patent rights to an employer because the latter had designated the employee to work on a business related "problem [that] entailed invention").

452. See *id.* at 407-09 (considering the factual and contractual aspects of the employment relationship in order to determine ownership of patent).

453. See *id.*

454. *Withington-Cooley Mfg. Co. v. Kinney*, 68 F. 500, 506 (6th Cir. 1895); see also *Finley v. Asphalt Paving Co.*, 69 F.2d 498, 506 (8th Cir. 1934) (noting that "the scope of an implied license depends upon the circumstances which created it, and it rests ultimately upon the intention of the parties" (citing *Neon Signal Devices, Inc. v. Alpha-Claude Neon Corp.*, 54 F.2d 793, 794 (W.D. Pa. 1931))); *Barber v. National Carbon Co.*, 129 F. 370, 374 (6th Cir. 1904) (noting that "[t]he duration and scope of a license must depend on the nature of the invention, and the circumstances out of which an implied license must be presumed, and both must depend on the intention of the parties" (quoting *Withington-Cooley*, 68 F. at 506)); *Neon Signal Devices*, 54 F.2d at 794 ("Naturally, the scope of an implied license depends upon the circumstances which created it, and it rests ultimately upon the intention of the parties." (citing *Withington-Cooley*, 68 F. at 500; *Tin Decorating Co. v. Metal Package Corp.*, 29 F.2d 1006 (S.D.N.Y. 1928))); *Tin Decorating Co.*, 29 F.2d at 1007 ("[T]he scope of an implied license is to be determined by the circumstances out of which it arises, including the relation and conduct of the parties . . . and all the other circumstances upon which agreement may be implied or estoppel enforced."), *aff'd*, 37 F.2d 5 (2d Cir. 1930);

A number of copyright cases also deal with questions of implied license scope,⁴⁵⁵ particularly where authors or artists have created copyrightable works at another's request and have delivered the finished product without providing for any formal, written agreement respecting copyright ownership or other allocation of rights in the copyrightable works.⁴⁵⁶ None of these cases imposes an artificial restriction on the nature of the evidence that might be received to determine the scope of the implied license. In at least one case, the court, "not see[ing] how it [could] be argued that only the existence and not the scope of a license can be proved by parol evidence," found a genuine issue of material fact that precluded summary judgment on the question of implied license scope.⁴⁵⁷ Another court more clearly embraced an all-circumstances approach, ruling that "[t]he existence and scope of . . . an implied license depends upon

McKinnon Chain Co. v. American Chain Co., 259 F. 873, 878 (M.D. Pa. 1919) (quoting *Withington-Cooley* with approval), *aff'd*, 268 F. 353 (3d Cir. 1920). See generally 6 ERNEST BAINBRIDGE LIPSCOMB III, WALKER ON PATENTS § 20:14 (3d ed. 1987) ("The scope of an implied license depends upon the circumstances which created it, and it rests ultimately upon the intentions of the parties.").

Professor Robinson's treatise was highly influential in the adoption of the all-circumstances approach to implied license scope in shop rights cases. 2 WILLIAM C. ROBINSON, ROBINSON ON PATENTS § 809, at 588-89 (1890) (stating that the scope of implied license "is determined by the circumstances out of which it has arisen"). Robinson himself relied upon an early shop rights case for the rule. See *Montross v. Mabie*, 30 F. 234, 237 (C.C.S.D.N.Y. 1887) (reasoning that "[t]he extent of the license is a question of construction, and, as in the case of other contracts expressed or implied, is to be determined in accordance with the intention of the parties").

455. As in many other contexts, the implied license in the copyright context is an exclusion from the statute of frauds, based upon the pragmatic consideration that parties often fail to respect formalities when creating or transferring property interests. See 17 U.S.C. § 204(a) (1994) (stating that transfer of ownership in copyright "is not valid unless an instrument of conveyance, or a note or memorandum of the transfer, is in writing and signed by the owner of the rights conveyed"); 17 U.S.C. § 101 (1994) (excluding nonexclusive licenses from the "transfer of copyright ownership"); MELVILLE B. NIMMER & DAVID NIMMER, 3 NIMMER ON COPYRIGHT § 10.03[A], at 10-44 (1998) (stating that nonexclusive license may be implied from conduct). In many respects, these cases are similar to the "shop right" cases in patent law.

456. See, e.g., *Lulirama Ltd. v. Axxcess Broad. Servs., Inc.*, 128 F.3d 872, 882 (5th Cir. 1997) (stating that an implied license in advertising jingles included within its scope the rights to reproduce and make copies, prepare derivative works, distribute copies, and authorize public performance); *Effects Assocs. v. Cohen*, 908 F.2d 555, 559 (9th Cir. 1990) (finding that an implied license that was created when the plaintiff fulfilled a request to deliver special effects footage was sufficiently broad to cover both the defendant's use of the footage in a film and the distribution of the film); *Oddo v. Ries*, 743 F.2d 630, 634 (9th Cir. 1984) (holding that although an author who incorporated his preexisting articles into a manuscript as part of a partnership arrangement impliedly licensed the partnership to use the articles, the implied license did not cover the partnership's uses of the articles in works other than the manuscript).

457. *Gracen v. Bradford Exch.*, 698 F.2d 300, 303 (7th Cir. 1983).

the facts of the individual case," and, in particular, "the conduct of the parties."⁴⁵⁸

Courts dealing with determinations of the scope of an implied license in the patent context, including the repair-reconstruction context, should remain attentive to the development of this issue in copyright cases. Implied license issues seem to be arising with increasing frequency in copyright cases,⁴⁵⁹ and the trend is very likely to continue as cases reach the courts concerning copyrightable material that has been placed on-line.⁴⁶⁰

458. *Herbert v. United States*, 36 Fed. Cl. 299, 310 (1996).

459. *See, e.g., Jacob Maxwell, Inc. v. Veeck*, 110 F.3d 749, 753 (11th Cir. 1997) (concluding that the owner of a baseball team enjoyed an implied nonexclusive license to play a promotional song created at his request); *I.A.E., Inc. v. Shaver*, 74 F.3d 768, 778 (7th Cir. 1996) (holding that a construction company enjoyed an "implied nonexclusive license to use [an architect's] schematic design drawings" created at the company's request).

460. A number of commentators have suggested that the culture of the world wide web makes it reasonable to suppose that authors who place their copyrightable works on-line without restriction have granted an implied license to users to access their work, at least for noncommercial purposes. *See Allen R. Grogan, Implied Licensing Issues in the Online World*, 14 *COMPUTER LAW.*, Aug. 1997, at 1, 2 ("Given the inherent characteristics of the World Wide Web, it could be argued that the very act of placing materials on a Web site manifests an intention that others be able, at a minimum, to access and display the work on their computer screens."); *see also* Martin J. Elgison & James M. Jordan III, *Trademark Cases Arise from Meta-Tags, Frames*, *NAT'L. L.J.*, Oct. 20, 1997, at C6 ("Some argue that because links are such an inherent part of the Web, anyone choosing to operate a Web site has given an 'implied license' for others to link to it . . ."); Richard S. Vermut, *File Caching on the Internet: Technical Infringement or Safeguard for Efficient Network Operation?*, 4 *J. INTEL. PROP. L.* 273, 345-49 (1997) (analyzing whether file caches may be protected by an implied license arising when an author places a copyrighted work on-line).

For additional discussion on the implied license as it may arise in the context of intellectual property rights in digital media, *see* BRUCE A. LEHMAN, U.S. DEP'T OF COMMERCE, *INTELLECTUAL PROPERTY AND THE NATIONAL INFORMATION INFRASTRUCTURE: THE REPORT OF THE WORKING GROUP ON INTELLECTUAL PROPERTY RIGHTS* 129 n.424 (1995) (suggesting that an implied license may arise when a copyrighted work is posted to a newsgroup, but might not extend to activities such as distributing copies of the work to other newsgroups); Eric Schlachter, *The Intellectual Property Renaissance in Cyberspace: Why Copyright Law Could Be Unimportant on the Internet*, 12 *BERKELEY TECH. L.J.* 15, 46 (1997) (discussing the argument that uploading a copyrighted work onto the Internet might grant an implied license to provide hypertext links to the work); John C. Yates & Michael R. Greenlee, *Intellectual Property on the Internet: Balance of Interests Between The Cybernauts and the Bureaucrats*, 8 *J. PROPRIETARY RTS.*, July 1996, at 8, 10 (arguing that unless implied license or fair use is a defense, forwarding copyrighted works via e-mail could be copyright infringement); *see also* Jon Bing, *Re: Re: WWW-Implied Licenseset [sic]* (visited Jan. 11, 1999) <<http://www.cni.org/Hforums/cni-copyright/1995-03/0260.html>> (beginning a threaded discussion on the topic).

However, as Grogan points out, critical issues as to the proper scope of the implied license remain. *See* Grogan, *supra*, at 3 ("But it may be more difficult to determine whether, based on all of the facts and circumstances, a broader license should be implied, such as a license permitting permanent copies to be stored on a hard disk or distributed to third parties."). The scope issue will presumably be decided by reference to the existing

The general jurisprudence on implied license scope in patent and copyright cases provides at least two important insights for courts considering the repair-reconstruction problem. First, there is ample support for the proposition that implied license scope in general is determined by considering the reasonable expectations of the parties in view of all of the circumstances, including the parties' conduct. The repair-reconstruction problem, a type of implied license scope determination, should be analyzed in the same general way. The Federal Circuit should take the lead in pointing out this connection.

Applying a flexible, all-circumstances approach to repair-reconstruction would have important implications, not the least of which concerns the continuing viability of *Aro I*. An all-circumstances approach would diverge from the reasoning of *Aro I*, although arguably not the holding of *Aro I* if the case is read strictly.⁴⁶¹ Yet the Federal Circuit, as has been demonstrated, apparently considers itself free to apply such an approach notwithstanding *Aro I*.⁴⁶² The Federal Circuit should, at a minimum, make clear either that *Aro I* does not absolutely forbid the all-circumstances approach, or that after nearly forty years of experience with *Aro I*, in which courts have inevitably resorted to multiple-factor approaches, the Supreme Court would not be likely to follow *Aro I*'s reasoning should the issue be presented to the Court today.

Unfortunately, the Federal Circuit has not made the connection between the general jurisprudence on implied license scope and its repair-reconstruction jurisprudence. The court missed a golden opportunity to make such a connection in the recent *Hewlett-Packard* decision.⁴⁶³ Attempting to avoid a rule whereby the patentee's unilateral intentions could dominate the repair-reconstruction analysis, the court seemed to throw away intent altogether as a consideration.⁴⁶⁴

law on implied license scope in copyright, using an all-circumstances approach. *See id.* at 2 (citing traditional copyright cases for the all-circumstances rule).

Notions of customary practices on the internet will unquestionably be important as courts consider implied license scope in this context. Courts might be well-advised to consider UCC concepts of trade usage in this connection. *See generally infra* Part IV.C.

461. A strict reading of *Aro I* might lead one to conclude that, while the Court adopted the overall spentness standard as its holding, it limited its denigration of the multifactor approach to dicta. *See supra* notes 102-130 and accompanying text (discussing *Aro I*).

462. *See supra* notes 122-123 and accompanying text (discussing the multiple-factor approach employed by the Federal Circuit panel in *Aktiebolag*).

463. *See Hewlett-Packard Co. v. Repeat-O-Type Stencil Mfg. Corp.*, 123 F.3d 1445 (Fed. Cir. 1997), *cert. denied*, 118 S. Ct. 1304 (1998); *supra* notes 273-278 and accompanying text (discussing this case).

464. *See Hewlett-Packard*, 123 F.3d at 1453 (asserting that "HP's unilateral intentions" cannot control, and noting that "HP fails to recognize the distinction between what it intended to be the life of the cartridge . . . and its actual useful life").

Instead, the court could have made clear, as it had in *Carborundum*, that while the patentee's *unilateral* intentions as to implied license scope are not determinative, the balance of the parties' reasonable expectations, set in the context of all the circumstances surrounding the sales transaction, are determinative.⁴⁶⁵ Had it chosen this analysis, the court could have arrived at the same result while harmonizing its implied license and repair-reconstruction cases.

Another important insight from the implied license jurisprudence is that if an all-circumstances approach is employed to determine implied license scope, the analysis will inevitably include consideration of how the implied license was created. The implied license jurisprudence suggests that the issue of implied license scope in general cannot be entirely disentangled from the issue of implied license creation, and, unfortunately, the case law on implied license creation is in considerable ferment. Some cases apply an equitable estoppel approach (also referred to as "estoppel *in pais*") to implied license creation, based on representations by the patentee on which another relied to his or her detriment.⁴⁶⁶ Proof of reliance tends to be the major issue in these cases.⁴⁶⁷

465. *Carborundum Co. v. Molten Metal Equip. Innovations, Inc.*, 72 F.3d 872, 878 (Fed. Cir. 1995) (stating that while "[o]ne party's unilateral expectations as to the scope of the implied license are irrelevant," the scope of an implied license "must be based on what the parties reasonably intended . . . based on the circumstances of the sale").

466. Recently, the Federal Circuit has added an important gloss to these decisions by asserting that no "formal finding" of equitable estoppel is necessary to the creation of an implied license. See *Wang Labs., Inc. v. Mitsubishi Elecs. Am., Inc.*, 103 F.3d 1571, 1581 (Fed. Cir. 1997) (observing that the principles of equitable estoppel should only "serve as guidelines" for the implied license analysis), *cert. denied*, 118 S. Ct. 69 (1997); *id.* at 1582 (upholding a defense of implied license as a form of "equitable rather than legal estoppel, because the license arose from an accord implicit in the entire course of conduct between the parties").

467. See generally *De Forest Radio Tel. Co. v. United States*, 273 U.S. 236, 241 (1927) (stating that any language or conduct of a patent holder from which a person "may properly infer that the owner consents to his use of the patent . . . upon which the other acts, constitutes a license and a defense to an action for a tort"); *Bandag, Inc. v. Al Bolser's Tire Stores, Inc.*, 750 F.2d 903, 925 (Fed. Cir. 1984) (determining that "[t]he reliance required to establish equitable estoppel [did not] exist"); *Stickle v. Heublein, Inc.*, 716 F.2d 1550, 1559 (Fed. Cir. 1983) (stating that "the relatively few instances where implied licenses have been found rely on the doctrine of equitable estoppel"); *St. Joseph Iron Works v. Farmers Mfg. Co.*, 106 F.2d 294, 298 (4th Cir. 1939) (reasoning that because plaintiff assigned his patents he "asserted them to be valid, and he is estopped to deny their validity").

In the particular case of the sale of unpatented equipment that is used to practice a patented invention, the Federal Circuit has developed a two-part test that appears to spring from equitable estoppel principles. See *Met-Coil Sys. Corp. v. Korners Unlimited, Inc.*, 803 F.2d 684, 686-87 (Fed. Cir. 1986) ("First, the equipment involved must have no noninfringing uses. . . . Second, the circumstances of the sale must 'plainly indicate that the grant of a license should be inferred.'" (citation omitted) (quoting *Bandag*, 750 F.2d at 925)); see also *Carborundum Co. v. Molten Metal Equip. Innovations, Inc.*, 72 F.3d 872, 878 (Fed.

Other cases insist that the creation of implied licenses is a matter of legal estoppel.⁴⁶⁸ Explaining the differences, the Court of Claims noted:

The essence of legal estoppel that can be found in the estoppel of the implied license doctrine involves the fact that the licensor (or assignor) has licensed (or assigned) a definable property right for valuable consideration, and then has attempted to derogate or detract from that right. The grantor is estopped from taking back in any extent that for which he has already received consideration.⁴⁶⁹

Two points are important here. First, the fact that courts have used a variety of labels to characterize the nature of the implied license need not unduly complicate the implied license model for repair-reconstruction. Indeed, as the Federal Circuit has recently recognized, “[t]hese labels describe not different kinds of licenses, but rather different categories of conduct which lead to the same conclusion: an implied license.”⁴⁷⁰ Accordingly, the adoption of an implied license model for repair-reconstruction need not turn into an endless quest to characterize the inherent nature of the implied license.

Second, irrespective of whether the implied license to use and sell patented goods arising upon authorized sale is ultimately labeled legal estoppel, equitable estoppel, or some other variation, the analysis of the scope of an implied license involves an all-circumstances approach that focuses on reasonable expectations. In *Wang Laboratories*, for example, the court looked to the parties’ “entire course of conduct” in determining whether an implied license had been created, and did not suggest that it would apply a more constrained standard

Cir. 1995) (following the *Met-Coil* test); *Devices for Med., Inc. v. Boehl*, 822 F.2d 1062, 1068 (Fed. Cir. 1987) (same).

468. See, e.g., *AMP Inc. v. United States*, 389 F.2d 448, 453 (Ct. Cl. 1968) (“[T]he doctrine of implied license does not rest on a theory of estoppel in pais, but rather on a rationale of legal estoppel. This latter term is merely shorthand for saying that a grantor of a property right or interest cannot derogate from the right granted by his own subsequent acts.”).

469. *Id.* at 452; see also *Wang Labs.*, 103 F.3d at 1581 (“Legal estoppel refers to a narrower category of conduct encompassing scenarios where a patentee has licensed or assigned a right, received consideration, and then sought to derogate from the right granted.” (citing *Spindelfabrik Suessen-Schurr Stahlecker & Grill GmbH v. Schubert & Salzer Maschinenfabrik Aktiengesellschaft*, 829 F.2d 1075, 1080 (Fed. Cir. 1987))); *Spindelfabrik*, 829 F.2d at 1080 (“The rationale for [legal estoppel] is to estop the grantor from taking back that for which he received consideration.” (citing *AMP*, 389 F.2d at 452)). “Legal estoppel” is also known as estoppel by deed, a common species of which is estoppel by warranty. See *AMP*, 389 F.2d at 452 n.5.

470. *Wang Labs.*, 103 F.3d at 1580.

to adjudicate scope.⁴⁷¹ Similarly, nothing in the implied license cases resting on legal estoppel suggests that courts will isolate only a single factor (such as the nature of the patented device) in order to determine the scope of the license.

B. *Implied License Scope from a Property Perspective*

The purchaser's implied license to use patented goods has come to serve a useful social function by formalizing, *ex ante*, property rights as between parties to an informal, commonplace transaction in goods. Similarly, the implied license in real property long has formalized rights connected to land arising from the most mundane of activities, where the requirements of the traditional categories of servitudes are not satisfied. Examples of the implied license in land are plentiful: implied licenses might arise from permission to the public to enter business premises,⁴⁷² informal permission to use a road over another's land,⁴⁷³ permission to use railroad rights-of-way,⁴⁷⁴ permission to cross navigable waters overlying private lands,⁴⁷⁵

471. *Id.* at 1581-82 (citing *De Forest Radio Tel. Co.*, 273 U.S. at 241).

472. See *State v. Quinzel*, 151 N.W.2d 598, 602 (Minn. 1967) (referring to "the implied license to enter upon the premises of another for purposes of ordinary business intercourse with the landowner"); *Lloyd Corp. v. Whiffen*, 773 P.2d 1294, 1314 (Or. 1989) (referring to a revocable license to enter a store or restaurant (citing *Penn v. Henderson*, 146 P.2d 760 (1944))).

473. See, e.g., *Hollis v. Tomlinson*, 585 So. 2d 862, 865 (Ala. 1991) (characterizing the defendant's permissive use of a road over plaintiff's land as falling short of an easement); *Pettus v. Keeling*, 352 S.E.2d 321, 323 (Va. 1987) (holding that the use of a road across private land "with the knowledge and acquiescence of the owners" created an easement).

474. Specifically, these cases concern the implied license to use or cross railroad rights-of-way, an issue that has arisen in cases dealing with the railroad's responsibility of due care to licensees. See, e.g., *Federal Life Ins. Co. v. Zebec*, 82 F.2d 961, 964 (7th Cir. 1936) (holding that "there was an implied license from the railroad company to the public and pedestrians to use the track"); *Director Gen. of R.Rs. v. Reynolds*, 268 F. 948, 950 (6th Cir. 1920) (stating that status as a licensee "depends upon whether there was . . . a customary and permissive use"); *Hodges v. Erie R.R. Co.*, 257 F. 494, 496 (6th Cir. 1919) (*per curiam*) (reasoning that "a license to use the pathway over the tracks when not occupied by a train [did not] include [] a license to cross when the pathway was so occupied"); *Erie R.R. Co. v. Burke*, 214 F. 247, 251 (2d Cir. 1914) (holding railroad company liable for the injuries sustained by the plaintiff because "the public had been permitted for years with the acquiescence of the railroad company to use the tracks at the place of this accident in the manner this plaintiff used them"); *Great N. R.R. Co. v. Thompson*, 199 F. 395, 398 (9th Cir. 1912) (discussing the requirements to qualify as a licensee); *Farley v. Cincinnati, H. & D.R. Co.*, 108 F. 14, 18 (6th Cir. 1901) (considering "the question of implied license, and the evidence and use essential to establish such a license").

475. See, e.g., *Hilt v. Weber*, 233 N.W. 159, 164 (Mich. 1930) (stating that where private lands "have been encroached upon by the navigable waters of the Great Lakes, until such owners construct dykes or levees which prevent, there is an implied license to the public to enter upon and use and navigate such water, and to exercise all the rights incident to navigation" (quoting *Kavanaugh v. Baird*, 217 N.W. 2 (Mich. 1928))); *Brusco Towboat Co.*

and in other real property contexts.⁴⁷⁶ The implied license is also of interest in admiralty cases.⁴⁷⁷

In the law of real property, the license is an ancient concept that attempts to define the relationship between a landowner and another regarding the use of land.⁴⁷⁸ Thus, a discussion of licenses in land fits alongside a discussion of the law of servitudes generally, which also defines usufructuary rights in land.⁴⁷⁹

v. State, 589 P.2d 712, 720 (Or. 1978) (in banc) (stating that the right to use riparian waters is "derived from a passive or implied license" (citation omitted)).

476. For additional examples illustrating the wide array of cases in which the express or implied license in land may arise, see JON W. BRUCE & JAMES W. ELY, JR., *THE LAW OF EASEMENTS AND LICENSES IN LAND* ¶ 11.01[1], at 5, 6 (rev. ed. 1995).

477. The implied license has routinely been used in the law of admiralty as a label for the general permission provided to ships to enter friendly ports. See, e.g., *Coleman v. Tennessee*, 97 U.S. 509, 516 n.1 (1878) (stating that a ship's passage is free from interference based on an implied license); *La Nereyada*, 21 U.S. (8 Wheat.) 108, 164 (1823) (asserting that a vessel was protected by the "implied license under which she entered our waters"); *The Santissima Trinidad*, 20 U.S. (7 Wheat.) 283, 354 (1822) (concluding that the implied license to use a port does not extend to protect misconduct); *The Schooner Exch. v. McFaddon*, 11 U.S. (7 Cranch) 116, 144 (1812) (construing the "implied license . . . under which [a] vessel enters a friendly port . . . [to] contain[] an exemption from the [local] jurisdiction").

Daniel Webster argued *The Santissima Trinidad*, which dealt with the scope of an implied license, and, particularly, an entirely different sort of repair-reconstruction problem. The Court found that a foreign vessel, even a vessel of war, had an implied license to enter a U.S. port, but that the license was limited in scope by a repair doctrine. *The Santissima Trinidad*, 20 U.S. at 353. Webster argued that the "implied license may extend to a mere replacement of the original force; but it cannot extend to such an augmentation of the force as would be inconsistent with the neutral character of the power granting the license." *Id.* at 324. Whether this was the inspiration for Webster's repair-reconstruction arguments in *Wilson v. Simpson* is open to speculation.

478. 8 THOMPSON ON REAL PROPERTY § 64.02(a) (David A. Thomas ed., 1994) (defining a license as a "relationship between two or more persons with respect to the use of a tract of land in which there is nothing more than a revocable privilege by one of them to be upon the land, which presence would, in the absence of the privilege, be actionable by the other").

479. Easements, real covenants, and equitable servitudes comprise the traditional categories of servitudes. See generally ROGER A. CUNNINGHAM ET AL., *THE LAW OF PROPERTY* § 8 (2d ed. 1993).

Some surprising connections can be found between the law of servitudes and the law of intellectual property. Several scholars have drawn analogies between the law of servitudes and restrictions based on the post-sale use of subject matter protected by intellectual property rights, especially in copyright scholarship. See Thomas F. Cotter, *Pragmatism, Economics, and the Droit Moral*, 76 N.C. L. REV. 1, 53-54 (1997) (exploring connections between equitable servitudes on chattels and Continental concepts of moral rights in copyrighted works); Thomas M.S. Hemnes, *Restraints on Alienation, Equitable Servitudes, and the Feudal Nature of Computer Software Licensing*, 71 DENV. U. L. REV. 577, 593 (1994) (considering analogies between equitable servitudes and restrictive terms in software licenses); John M. Kernochan, *The Distribution Right in the United States of America: Review and Reflections*, 42 VAND. L. REV. 1407, 1413-15 (1989) (reviewing the notion of equitable servitudes on chattels in connection with the first sale doctrine of copyright law); Ken Lovern, *Evalu-*

Characterizing the license concept rigorously enough to make it useful as an analytical tool in law has long been considered a formidable task. Hohfeld, for example, reportedly viewed the term "license" as "a word of convenient and seductive obscurity" and the law of licenses as an "intricate and confused subject."⁴⁸⁰ Perhaps attempting to sidestep the difficulties, the *Restatement* defines license largely in terms of what it is not: it is an interest relating to land, where the interest does not qualify as an easement.⁴⁸¹

More straightforwardly, a license is often defined as "permission to do an act or series of acts on another's land that, absent authorization, would constitute trespass."⁴⁸² Importantly for purposes of under-

ating Resale Royalties for Used CDs, KAN. J. L. & PUB. POL'Y, Fall 1994, at 113, 116 (analyzing analogies between equitable servitudes on chattels and the notion of resale royalties on copyrighted works).

Scholars also have examined the connections between the patent exhaustion doctrine and equitable servitudes on chattels. See Zechariah Chafee, Jr., *Equitable Servitudes on Chattels*, 41 HARV. L. REV. 945, 999-1005 (1928) [hereinafter Chafee, *Equitable Servitudes*] (considering the application of an equitable servitudes theory to patent cases, particularly those involving restrictions on the use of patented chattels); Bruce D. Gray, Note, *Mallinckrodt Inc. v. Medipart Inc.: Express Limitations on the Use of a Patented Product After Sale*, 13 GEO. MASON L. REV. 803, 820-21 (1991) (analyzing restrictions that impose a negative duty on the purchaser of patented goods to refrain from specified uses of the goods to equitable servitudes).

Scholars have persuasively explained in economic terms the law's reluctance to enforce equitable servitudes in chattels. See Henry Hansmann & Marina Santilli, *Authors' and Artists' Moral Rights: A Comparative Legal and Economic Analysis*, 26 J. LEGAL STUD. 95, 101-02 (1997) (highlighting problems of notice and impairment of alienability, and pointing out that the efficiency that may result from large-scale coordination of uses on adjoining parcels of real estate may not be achievable for chattels). The value of the equitable servitude on chattels as an analogy for repair-reconstruction is limited because cases approving of equitable servitudes in chattels are exceedingly rare. See Zechariah Chafee, Jr., *The Music Goes Round and Round: Equitable Servitudes and Chattels*, 69 HARV. L. REV. 1250, 1258 (1956) [hereinafter Chafee, *The Music Goes Round*] (noting that "it is an extraordinary thing for the law to enforce [equitable servitudes] at all").

480. Wesley Newcomb Hohfeld, *Faulty Analysis in Easement and License Cases*, 27 YALE L.J. 66, 92 (1917).

481. Specifically, the *Restatement* defines license as an interest in another's land which

- (a) entitles the owner of the interest to a use of the land, and
- (b) arises from the consent of the one whose interest in the land used is affected thereby, and
- (c) is not incident to an estate in the land, and
- (d) is not an easement.

RESTATEMENT OF PROPERTY: SERVITUDES § 512 (1944). An introductory note in the *Restatement* explains that the license is "the residue of those privileges of use of land arising out of the consent of the possessor of the land which are not included with the definition of easements." RESTATEMENT OF PROPERTY: SERVITUDES, PT. II, INTRODUCTORY NOTE (1944).

482. BRUCE & ELY, *supra* note 476, ¶ 1.03[1], at 7 (citation omitted). This definition is consistent with a famous passage from an early British case:

A . . . license properly passeth no interest, nor alters or transfers property in any thing, but only makes an action lawful, which without it had been unlawful. As a

standing how the implied license model may change courts' approach to the repair-reconstruction problem, the persistent characteristic of any definition of a license is *consent*.⁴⁸³

It is, of course, the scope of the consent that is of concern for purposes of analogizing to the repair-reconstruction problem. The *Restatement of Property* sets forth a general rule for the scope of licenses in land: "The extent of a license is fixed by the terms of the consent which creates it."⁴⁸⁴ With regard to implied licenses, because there are no express terms of consent, courts must determine the scope of the license:

by holding the licensor responsible to the extent to which he might reasonably have foreseen reliance upon an appearance of consent indicated by his conduct and by limiting the privilege of the licensee to such uses as are made in reasonable reliance upon an appearance of consent by the licensor.⁴⁸⁵

This link between an implied license's scope, and the extent of the licensor's consent, is important for the repair-reconstruction problem. Courts have clearly been troubled by reliance on intent (particularly the supposed intent of the patentee) in adjudicating repair-reconstruction disputes; it may simply be too easy, and too tempting, for the patentee to develop "intentions" post hoc and introduce them at trial as if they were readily apparent to the patentee and the purchaser at the time of the transaction.

While not entirely obviating the problem, the consent formulation may allow courts in repair-reconstruction cases to establish some distance from purely subjective intent, while retaining the general approach of surveying the evidence for manifestations of mutually agreed-upon expectations. For example, on the licensor's side:

The consent of a licensor may be broader than he intended because, having appeared to intend more than he did, and

license to go beyond the seas, to hunt in a mans park, to come into his house, are only actions, which without license, had been unlawful.

Thomas v. Sorrell, 124 Eng. Rep. 1098, 1109 (K.B. 1673). Professor Clark noted that the case did not deal with a license in land, but rather with "another kind of interest, namely, a dispensation or patent from the King against the operation of a statute providing a penalty for selling liquor without license." Charles E. Clark, *Licenses in Real Property Law*, 21 COLUM. L. REV. 757, 759 n.8 (1921).

483. See Clark, *supra* note 482, at 758 (noting that the word "license" has its root in the Latin *licentia*, meaning freedom or liberty, and that this origin explains the core of the current concept—permission or consent).

484. RESTATEMENT OF PROPERTY: SERVITUDES § 516 (1944).

485. *Id.* § 516 cmt. b.

having so acted that he should reasonably have foreseen the appearance resulting from his consent, *he is deemed to have consented to the extent of the appearance he created.*⁴⁸⁶

Likewise, where the licensee's outward manifestations of consent diverge from the licensee's "intent," the manifestations of consent control.⁴⁸⁷ Effectively, then, the approach calls for an assessment of the reasonableness of the expectations of the parties to the license transaction.⁴⁸⁸

Applying these notions to the repair-reconstruction problem, a court could eschew notions of the patentee's unilateral intent and instead analyze the reasonableness of the parties' expectations. Specifically, the court could analyze, for example, the patentee's conduct, asking whether the patentee could reasonably have foreseen that purchasers would rely upon the appearance of consent which that conduct created. Relevant conduct on the part of the patentee could include the patentee's statements (in the patent specification, in promotional literature, or elsewhere) as well as the patentee's design choices as embodied in the device at issue.⁴⁸⁹

Unfortunately, because most licenses in land are terminable at the licensor's will, the fine points of license scope rarely become the subject of litigation.⁴⁹⁰ However, cases analyzing the scope of easements do arise more frequently. An easement, of course, is a nonpossessory interest in another's land,⁴⁹¹ which may be created by express agreement complying with the local statute of frauds, by implication, or by prescription.⁴⁹² In general, easements are distinct from licenses because the latter are ordinarily terminable at the will of the licensor,⁴⁹³ while easements are not.⁴⁹⁴ In a variety of circumstances, how-

486. *Id.* (emphasis added).

487. *Id.*

488. See 8 THOMPSON ON REAL PROPERTY, *supra* note 478, § 64.04(a), at 27 (noting that, in the absence of agreement, the rights of the licensee become "a question of the reasonableness of the expectations of the parties").

489. By considering the patentee's design choices, this Article is not, of course, suggesting a return to the use of spentness rhetoric as an end in itself. Instead, it is suggesting the use of spentness rhetoric as an indicium of intent. See generally *supra* Part II.

490. See BRUCE & ELY, *supra* note 476, ¶ 11.03, at 9, 10.

491. See GERALD KORNGOLD, PRIVATE LAND USE ARRANGEMENTS: EASEMENTS, REAL COVENANTS, AND EQUITABLE SERVITUDES 5 (1990).

492. BRUCE & ELY, *supra* note 476, ¶ 1.01, at 3.

493. See RESTATEMENT OF PROPERTY: SERVITUDES § 519(1) (1944) (stating that, with some exceptions, "a license is terminable at the will of the possessor of the land subject to it"). This is not surprising because licenses are founded upon consent, which in most circumstances the licensor can simply withdraw. Viewed in this way, licenses seem quite distinct from interests in land, and in fact most authorities consider licenses not to rise to the level of an interest in land. See, e.g., BRUCE & ELY, *supra* note 476, ¶ 11.01, at 2.

ever, licenses can become “irrevocable”—meaning that they cannot simply be revoked at the licensor’s whim, although they may have a limited duration.⁴⁹⁵

The implied license to use a patented item upon authorized sale has much in common with the “irrevocable” license in land.⁴⁹⁶ To be sure, the implied license to repair can be altered or conditioned by express statements from the patentee. However, where an implied license to repair springs into existence in the wake of an unconditional sale of patented goods, the patentee cannot later revoke the license at his whim. Thus, once created, the implied license to use a patented item may reasonably be analogized to the irrevocable license in land.

Because it is well established in the law of servitudes that irrevocable licenses in land are analytically indistinct, in most respects, from easements,⁴⁹⁷ guidelines concerning the scope of easements may be useful in analyzing scope questions concerning irrevocable licenses in

494. See generally CUNNINGHAM ET AL., *supra* note 479, § 8.12.

495. RESTATEMENT OF PROPERTY: SERVITUDES §§ 519(3), (4) (stating that a license coupled with an interest may be terminated “only to such an extent as not to prevent the license from being effective to protect the interest,” and explaining that a “licensee . . . who has made expenditures of capital or labor in the exercise of his license in reasonable reliance upon representations by the licensor as to the duration of the license, is privileged to continue the use permitted . . . to the extent reasonably necessary to realize upon his expenditures”).

496. There may also be some subtle differences. For example, a license in land can become irrevocable by operation of subsequent events or through payment of consideration, whereas the implied license growing out of the unconditional sale of patented goods presumably would arise even if no consideration were paid—e.g., the gift of patented goods presumably would support an implied license to use and resell the goods.

In addition, a number of courts and commentators offer an equitable estoppel rationale as the basis for the irrevocable license. See, e.g., *Camp v. Milam*, 277 So. 2d 95, 99 (Ala. 1973) (stating that, when the licensee makes expenditures which were contemplated by the licensor, “for reasons founded upon the equitable principle of estoppel, [the license] becomes irrevocable and confers upon the licensee a substantive equitable right in the property”); CUNNINGHAM ET AL., *supra* note 479, § 8.8, at 456-57 (asserting that estoppel is one of the theories on which courts have relied in finding licenses irrevocable); 4 RICHARD R. POWELL, *POWELL ON REAL PROPERTY* § 34.26, at 315 (Patrick J. Rohan ed., 1998) (noting that the consent giving rise to the license relationship “becomes irrevocable in equity whenever the recipient of the consent has executed his part of the transaction by payment, by taking possession, or by making expenditures in reliance upon the consent”). Accordingly, it is conceivable that a court would rule that a license is revocable notwithstanding the payment of valuable consideration if the equities ran strongly against the licensee. By contrast, the implied license to use and resell patented goods has become so entrenched in U.S. patent jurisprudence that it would be startling for a court to refuse to imply a license on the basis of equitable considerations. However it may have been viewed by nineteenth century courts, the implied license as it is used today seems more a creature of law.

497. See 4 POWELL, *supra* note 496, § 34.26, at 315 (stating that events subsequent to the formation of the license may transform it into what is effectively an easement enforced in equity). The irrevocable license may differ from a true easement in its duration. While an easement may be indefinite, an irrevocable license, under the *Restatement* approach, en-

land, and, by extension, the scope of an implied license in repair-reconstruction cases. In particular, the law concerning the scope of the narrow classes of implied easements⁴⁹⁸ presents an especially useful source of rules that could be applied in repair-reconstruction cases.⁴⁹⁹

dures only so long as is "reasonably necessary [for the licensee] to realize upon his expenditures." RESTATEMENT OF PROPERTY: SERVITUDES § 519(4) (1944).

498. Specifically, easements implied from prior use may provide an analogy. Such easements, along with easements implied from necessity, and easements created by prescription, all may present difficult scope issues. See CUNNINGHAM ET AL., *supra* note 479, § 8.9, at 457-58 ("Prescriptive and implied servitudes are always likely to present questions of scope or location, since the events giving rise to them are not communicative acts."). It is, however, important to note that approaches to scope among this group of easements may vary slightly depending upon exactly how the easement was created. See *Wright v. Horse Creek Ranches*, 697 P.2d 384, 388 (Colo. 1985) (en banc) (stating that "precise delineation of the means by which a particular easement is acquired is critical to any determination of the extent to which the owner of the dominant estate is entitled to burden the servient estate").

499. Easements (and implied licenses) may also arise through custom, a matter of recent scholarly interest. See David J. Bederman, *The Curious Resurrection of Custom: Beach Access and Judicial Takings*, 96 COLUM. L. REV. 1375, 1382-1413 (1996) (discussing the application of custom in property law); Carol Rose, *The Comedy of the Commons: Custom, Commerce, and Inherently Public Property*, 53 U. CHI. L. REV. 711, 714 (1986) (examining "the theory of 'custom,' where the public asserts ownership of property under some claim so ancient that it antedates any memory to the contrary"). Perhaps the best example of a license implied from custom concerns the nature of ranchers' rights to graze cattle on public lands in the western United States. As the Supreme Court described it:

At common law the owner was required to confine his live stock, or else was held liable for any damage done by them upon the land of third persons. That law was not adapted to the situation of those States where there were great plains and vast tracts of uninclosed land, suitable for pasture. And so, without passing a statute, or taking any affirmative action on the subject, the United States suffered its public domain to be used for such purposes. There thus grew up a sort of implied license that these lands, thus left open, might be used so long as the Government did not cancel its tacit consent.

Light v. United States, 220 U.S. 523, 535 (1911) (citing *Buford v. Houtz*, 133 U.S. 326 (1890)); see also *United States v. Grimaud*, 220 U.S. 506 (1911). For recent examples of grazing rights cases that cite the implied license rubric, see *Gardner v. Stager*, 892 F. Supp. 1301, 1303 (D. Nev. 1995) (noting that the Nevada Supreme Court "has referred to grazing on public lands as something done under an 'implied license'" (citing *Itcaina v. Marble*, 55 P.2d 625 (Nev. 1936))), *aff'd*, 103 F.3d 886 (9th Cir. 1996); *Hage v. United States*, 35 Fed. Cl. 147, 166 (1996) (finding that "[p]laintiff's grazing permit has the traditional characteristics and language of a revokable license"); *Fallini v. United States*, 31 Fed. Cl. 53, 57 (1994) (noting that the practice of grazing on public land became an implied license after years of use without government objection), *vacated*, 56 F.3d 1378 (Fed. Cir. 1995). The implied license has also been used to justify more general claims of access to public lands, e.g., for general recreational purposes. See *United States v. Curtis-Nevada Mines, Inc.*, 611 F.2d 1277, 1284 (9th Cir. 1980) (noting "a traditional policy for the use of public lands allowing the public to use lands within the public domain for general recreational purposes without holding a written, formal permit").

The scope of an implied license arising through custom is presumably dependent upon the scope of the custom from which the license was created, but the cases do not illuminate this point. Nonetheless, notions of custom as an interpretive device, rather than

In the case of easements created by necessity, implication, or prescription, because no express document is available for evidencing the scope of the easement, a court is left to determine the scope "by inference based primarily upon the circumstances" under which the easements were created.⁵⁰⁰ In general, courts determining the scope of these types of easements "are trying to effectuate the unexpressed intent of the parties," while also maintaining enough flexibility to accommodate reasonably foreseeable changes in the nature or intensity of the easement owner's use of the easement.⁵⁰¹

The tentative draft of the *Restatement (Third) of Property (Servitudes)* also provides a framework that could prove helpful in repair-reconstruction cases. The tentative draft establishes general rules for the interpretation of servitudes, specifying that the intentions of the parties should govern the interpretation of servitudes created by express agreement, and that the "reasonable expectations" of the parties should govern agreements created "by implication, necessity, or estoppel."⁵⁰² These reasonable expectations are inferred from the circumstances.⁵⁰³ The tentative draft also suggests that a series of default

as a source of property rights, can be very effective in resolving repair-reconstruction disputes. This is best explored via the concept of trade usage or trade custom in commercial law. See *infra* Part IV.C. for a discussion.

500. 4 POWELL, *supra* note 496, § 34.13, at 196; see also KORNGOLD, *supra* note 491, § 4.03, at 117 n.66 (citing cases that support the general view that the scope of implied easements is determined on the basis of an all-circumstances approach).

501. 4 POWELL, *supra* note 496, § 34.13, at 197. To focus on a particular example, consider the easement implied from prior use, created when a use exists at a time when a single parcel is split into multiple parcels. In ascertaining the scope of an easement implied from prior use, courts will generally start from the proposition that the scope of the easement depends upon the scope of the use in existence at the time when the subject property was severed into multiple parcels. However, courts may well incorporate additional uses that were reasonably foreseeable at the time of the severance. See KORNGOLD, *supra* note 491, § 4.03, at 118 (stating that "if the parties could reasonably have expected further development, that expectation will define the future use of an easement implied by prior use"). Courts are willing to extend the scope of an implied easement to reasonably foreseeable uses because the law presumes that the parties would have intended the easement to evolve in accordance with changes brought about as a result of reasonable and normal development of the property and its surroundings. *Id.* § 4.09, at 140-41. See generally RESTATEMENT OF PROPERTY: SERVITUDES § 483 cmt. e (1944) (contrasting the interpretation of express easements and those created by implication).

502. RESTATEMENT (THIRD) OF PROPERTY: SERVITUDES § 4.1(1)(b) (Tentative Draft No. 4, 1994).

503. See *id.* cmt. b ("Where there is little or no evidence of the parties' intentions, their reasonable expectations, inferable from the circumstances, are a proper guide to interpretation.").

rules should be used where a dispute remains due to conflicts in the evidence of reasonable expectations.⁵⁰⁴

In summary, an analysis of implied license scope from a real property perspective reinforces lessons from the intellectual property jurisprudence concerning the primacy of the parties' intentions. Moreover, the real property cases avoid the problem of resting implied license scope determinations on the licensor's unilateral, subjective intentions by formulating the test in terms of reasonable expectations, and by focusing on the scope of the licensor's apparent consent.

C. *Implied License Scope from a Contract Perspective*

Perhaps the most apparent outcome of applying an implied license model to the repair-reconstruction dichotomy is that repair-reconstruction might be transformed into a contract problem. This would produce some startling results, including the possibility of threatening patent law's hegemony over repair-reconstruction, because a contract is governed by state law. Indeed, the implied license patent case law includes some casual statements to the effect that implied licenses, like express licenses, are "governed by ordinary principles of state contract law."⁵⁰⁵

Apart from choice of law complexities, however, the analogy between the repair-reconstruction problem and implied license scope from a contract perspective is helpful in a number of ways. First, as might be expected, the contract jurisprudence can help explain the role of the parties' reasonable expectations. Second, contract law has developed a number of strategies to deal with the problem of gaps in the evidence on expectations and scope of consent. One such strategy, the resort to evidence of trade custom as developed in the Uniform Commercial Code, should prove to be especially useful in resolving repair-reconstruction disputes.

In his treatise, Professor Adelman has laid the groundwork for understanding the repair-reconstruction problem from a contract per-

504. See *id.* The series of default rules set forth in the *Restatement* go to the particulars of traditional easements and present no particularly interesting analogies for the repair-reconstruction analysis, but the overall scheme of a general expectations-based analysis supplemented by default rules might be an appropriate one to pursue for repair-reconstruction.

505. *McCoy v. Mitsuboshi Cutlery, Inc.*, 67 F.3d 917, 920 (Fed. Cir. 1995); see also *Ideal Wrapping Mach. Co. & George Close Co.*, 23 F.2d 848, 850 (D. Mass.) ("When the owner of a patent sells a patented machine, he thereby frees it from the control of the patent law; the results which flow from the sale are dependent on the law of contracts."), *aff'd*, 29 F.2d 533 (1st Cir. 1928).

spective. Professor Adelman points out that the “essential economic function” of the repair-reconstruction dichotomy is to identify “what most purchasers would put into a contract if they had to formally negotiate for the purchase of the technology separate from the manufactured product.”⁵⁰⁶ Such a “negotiation” might presumably revolve around the parties’ expectations as to factors such as the value of the replaced components,⁵⁰⁷ the useful life of components,⁵⁰⁸ or even the expectation that the patented device will be usable only once before reconditioning will be required,⁵⁰⁹ ultimately relating, of course, to the scope of the royalty obligation.⁵¹⁰ This perspective is especially illuminating because it shows that a shift to the implied license model does not mean that the spentness analysis must be ignored; instead, it means that the spentness analysis is placed in its proper context as an indicator of the patentee’s and the purchaser’s probable expectations.

1. *The Implied License as Implied-in-Fact Contract.*—If the repair-reconstruction problem, framed as a question of implied license scope, is to be analyzed as a contract problem, a threshold question is whether the implied license is an implied-in-fact or an implied-in-law contract. Opinion is split on whether the implied license arising in various intellectual property contexts should be treated as an implied-in-fact or an implied-in-law contract. A number of recent appellate copyright decisions,⁵¹¹ and some patent cases,⁵¹² have treated implied licenses as a species of implied-in-fact contract. By contrast, some

506. MARTIN J. ADELMAN, *PATENT LAW PERSPECTIVES* § 3.8, at 124 (1995).

507. Professor Adelman suggests, for example, that the parties might bargain for a provision that establishes a definite royalty on any machine in which the total value of the replaced parts exceeded the total value of the machine. *Id.* This is a restatement of the dominance test in contract terms.

508. *Id.*

509. In this situation, Professor Adelman proposes that reasonable parties would agree that reconditioning the machine would always require a royalty payment even where the reconditioning activities might seem modest. *Id.*

510. Analyzed in this way, the existing law on repair-reconstruction can be understood as a rule that “require[s] a manufacturing patentee to collect up front from the purchaser for all conceivable repairs for the product, even such major ones as replacing an essential part of the combination even if that part ordinarily outlasts the other parts of the patented machine.” *Id.*

511. *See, e.g.,* Lulirama, Ltd. v. Axxcess Broad. Servs., Inc., 128 F.3d 872, 882 (5th Cir. 1997) (finding that “a nonexclusive license supported by consideration is a contract” (citing *Jacob Maxwell, Inc. v. Veeck*, 110 F.3d 749, 752-53 (11th Cir. 1997))); *I.A.E., Inc. v. Shaver*, 74 F.3d 768, 776 (7th Cir. 1996) (asserting that “implied licenses are like implied contracts”); *Effects Assocs. v. Cohen*, 908 F.2d 555, 559 n.7 (9th Cir. 1990) (“Plaintiff cites no authority for the proposition that an implied license is equitable in nature; it seems to us to be a creature of law, much like any other implied-in-fact contract.”); *see also* 3 NIMMER & NIMMER, *supra* note 455, § 10.01[C][5] & n.73.1, at 20 (“A license is, in legal contemplation, merely an agreement not to sue the licensee for infringement.”).

scholars considering the patent exhaustion problem have assumed that the implied license to use patented goods upon authorized sale arises as a license implied in law.⁵¹³

In traditional doctrine, implied-in-fact contracts and implied-in-law contracts differ sharply with respect to the role played by the parties' intentions in the formation of the contract. The term "implied-in-fact" contract "refers to that class of obligations which arises from mutual agreement and intent to promise, when the agreement and promise have simply not been expressed in words."⁵¹⁴ An implied-in-fact contract, then, might be considered simply a contract by conduct.⁵¹⁵ However, the conduct, in the context of the surrounding facts and circumstances (including course of dealing, usage of trade, or course of performance), must evidence all of the elements of an express contract.⁵¹⁶ Thus, the facts must at least allow for an inference of mutuality of intent to contract, including an offer and acceptance, and consideration.⁵¹⁷ The distinction between express and implied-in-fact contracts involves "no difference in legal effect, but lies merely in the mode of manifesting assent."⁵¹⁸

By contrast, contracts "implied-in-law" (quasi-contracts) are obligations "imposed by the courts for the purpose of bringing about a

512. See, e.g., *Cardiovascular Diagnostics, Inc. v. Boehringer Mannheim Corp.*, 985 F. Supp. 615, 621 (E.D.N.C. 1997) ("Existing predominantly in the realm of patent law, the implied license doctrine has evolved as a form of implied-in-fact contract."); *Medeco Sec. Locks, Inc. v. Lock Tech. Corp.*, 199 U.S.P.Q. (BNA) 519, 524 (S.D.N.Y. 1976) ("Like any other implied contract, an implied license arises out of the objective conduct of the parties, which a reasonable man would regard as indicating that an agreement has been reached. It cannot arise out of the unilateral expectations of one party . . .").

513. See, e.g. *Oddi*, *supra* note 3, at 120 (stating that "an implied license is . . . implied in law and takes effect by operation of law").

514. 1 SAMUEL WILLISTON, A TREATISE ON THE LAW OF CONTRACTS § 1:5, at 20 (Richard A. Lord ed., 4th ed. 1990); see *Teets v. Chromalloy Gas Turbine Corp.*, 83 F.3d 403, 409 (Fed. Cir. 1996) (concluding that "[t]he test for an implied-in-fact contract . . . focus[es] on whether . . . the employee received an assignment on this occasion to invent").

515. See *Baltimore & Ohio R.R. v. United States*, 261 U.S. 592, 597 (1923) (finding that an implied contract "is inferred, as a fact, from conduct of the parties showing, in light of the surrounding circumstances, their tacit understanding"); *Prudential Ins. Co. of Am. v. United States*, 801 F.2d 1295, 1297 (Fed. Cir. 1986) ("A contract implied in fact is not created or evidenced by explicit agreement of the parties, but is inferred as a matter of reason or justice from the acts or conduct of the parties."); 1 WILLISTON, *supra* note 514, § 1:5, at 22 ("[A] contract by conduct, that is, one inferred or implied in fact, is yet another type of contract within our general definition.").

516. See RESTATEMENT (SECOND) OF CONTRACTS § 4, cmt. a (1979).

517. See *Yachts Am. Inc. v. United States*, 779 F.2d 656, 661 (Fed. Cir. 1985) (asserting that for a contract to be implied-in-fact, "the legal requisites of an express contract, offer, acceptance, agreement, consideration, etc., must be provided").

518. RESTATEMENT (SECOND) OF CONTRACTS § 4, cmt. a (1979).

just result without reference to the intention of the parties."⁵¹⁹ Consequently, quasi-contracts are generally portrayed in modern scholarship as being unlike true contracts in two fundamental ways: They are public arrangements, not private ones,⁵²⁰ and they are created as a remedy for unjust enrichment.⁵²¹

Plainly, the distinction between implied-in-fact contract and quasi-contract will be difficult to discern in some cases.⁵²² Conduct that to one person results in unjust enrichment, justifying imposition of a quasi-contractual obligation, may to another person partially manifest assent, justifying imposition of an implied-in-fact contract.⁵²³

It is telling that at least one scholar has recently cautioned against drawing fine distinctions between implied-in-fact and implied-in-law contracts.⁵²⁴ Reasonable arguments can be made that the implied license to use patented goods after purchase may be labeled an implied-in-fact or an implied-in-law contract, but the better view is that the implied license should be treated as one implied-in-fact, as at least one other commentator has pointed out.⁵²⁵

2. *Trade Usage and Implied License Scope.*—One advantage of considering the repair-reconstruction problem by analogy to implied-in-fact contracts is that contract jurisprudence provides a well-developed set of basic rules for filling out the unstated terms of agreements. One example particularly pertinent to the repair-reconstruction prob-

519. 1 WILLISTON, *supra* note 514, § 1:6, at 25; see RESTATEMENT (SECOND) OF CONTRACTS (1979), § 4, cmt. b (1979) (discussing quasi-contracts).

520. See Clare Dalton, *An Essay in the Deconstruction of Contract Doctrine*, 94 YALE L.J. 997, 1021 (1985) (distinguishing contracts implied-in-fact and those implied-in-law or quasi-contracts, which, "in contrast, are 'public'").

521. See *id.* (stating that quasi-contract is covered in the *Restatement of Restitution*, not in the *Restatement of Contracts*); see also *Hercules Inc. v. United States*, 516 U.S. 417, 424 (1996) (stating that an implied-in-law contract is a "'fiction of law' where 'a promise is imputed to perform a legal duty, as to repay money obtained by fraud or duress'" (quoting *Baltimore & Ohio R.R. Co. v. United States*, 261 U.S. 592, 597 (1922))).

522. See RESTATEMENT (SECOND) OF CONTRACTS § 19, cmt. a (1979) (stating that "the line between a contractual claim based on agreement and a quasi-contractual claim based on unjust enrichment is often indistinct").

523. See Dalton, *supra* note 520, at 1022 (concluding that "[t]he uncertainty of conduct as evidence of agreement can make it unclear whether a particular relationship should be considered contractual or quasi-contractual").

524. See *id.* at 1014-15 (observing an "essential similarity" between the judicial choice to impose quasi-contractual obligations and the decision that circumstances evidence implied-in-fact contractual obligations).

525. See Scott A. Chambers, *Exhaustion Doctrine in Biotechnology*, 35 IDEA 298, 311, 322-24 (1995) (assuming that the patent exhaustion doctrine gives rise to an implied-in-law license and arguing that the license should instead be treated as one implied-in-fact). Chambers points out simply that transactions in patented goods are so variable that a factual exploration of the parties' intentions will ordinarily be justified.

lem is UCC Article 2's "usage of trade" concept.⁵²⁶ The UCC defines "usage of trade" as "any practice or method of dealing having such regularity of observance in a place, vocation or trade as to justify an expectation that it will be observed with respect to the transaction in question."⁵²⁷ The "usage of trade" provision bears directly on the repair-reconstruction problem because the provision was specifically designed to determine the scope of a contract⁵²⁸ by filling out the "terms" of a contract created through conduct.⁵²⁹

The usage of trade provision instructs us to consider the customary commercial practices prevalent in a given industry. The Official Comment to the UCC makes it clear that commercial agreements are to be interpreted with reference to the commercial context in which

526. Some cases in the repair-reconstruction context and other related contexts make passing mention of trade custom in their analyses, but none take full advantage of trade usage principles as developed under the UCC. See, e.g., *Landis Mach. Co. v. Chaso Tool Co.*, 141 F.2d 800, 803 (6th Cir. 1944) (considering and rejecting plaintiff's argument that the "general trade practice developed in the industry long before [plaintiff] entered the field"); *Davis Elec. Works v. Edison Elec. Light Co.*, 60 F. 276, 281 (1st Cir. 1894) (hinting at a custom analysis by observing that through 13 years of the patent's life and after some 13 million of the patented bulbs had been manufactured by the patentee, no one until defendant had ever attempted to recondition the bulbs).

Although it is a general exhaustion case rather than a repair-reconstruction case, the court's opinion in *Cream Top Bottle Corp. v. Bailes*, 62 F.2d 714 (10th Cir. 1933), provides another interesting example. The plaintiff had a patent on a milk bottle, and plaintiff's distributor had an exclusive arrangement to use the bottles for milk delivery. *Id.* at 715. Customary practice in the dairy business at the time was to deliver filled bottles to customers who would either pay a refundable deposit on the bottles, or, more commonly, would exchange empty bottles for the filled ones to avoid the need for a deposit. *Id.* Because of these exchanges, the patented bottles came into use by others besides the exclusive distributor, generating an infringement lawsuit. *Id.* at 715-16. In response to the plaintiff's argument that the trade customs could not be considered, the court stated:

[T]here is no rule of law requiring the court to close its eyes to what is known to every one else, including plaintiff, defendants, and all the witnesses, and that is that the usage of the business in Kansas City is that the housewife is not obligated to earmark and return the identical bottle; she may return any other sound bottle or pay five cents. The courts . . . not only may but must ascertain how milk bottles are customarily used in Kansas City

Id. at 717-18; cf. *Virginia Panel Corp. v. Mac Panel Co.*, 887 F. Supp. 880, 887-88 (W.D. Va. 1995) (noting that, in determining whether an implied license has been created, standard industry practice is relevant, but is overridden by parties' express statements to the contrary), *aff'd*, 133 F.3d 860 (Fed. Cir. 1997), *cert. denied*, 119 S. Ct. 52 (1998).

527. U.C.C. § 1-205(2) (1995).

528. That is, usage of trade is a matter of contract interpretation, not contract formation. See 1A RONALD A. ANDERSON, *ANDERSON ON THE UNIFORM COMMERCIAL CODE* § 1-205:5, at 308 (3d ed. 1996) ("Usage of trade is employed to interpret a contract but cannot be employed to show that there was a contract.").

529. See 1 JAMES J. WHITE & ROBERT S. SUMMERS, *UNIFORM COMMERCIAL CODE* 135 (3d ed. 1988).

they were created.⁵³⁰ By incorporating a "usage of trade" provision, the UCC intends to "reject those cases which see evidence of 'custom' as representing an effort to displace or negate 'established rules of law.'"⁵³¹

At the same time, the UCC's "usage of trade" concept seeks to avoid some of the problems often encountered in efforts to rely upon custom as law. A trade usage is not subject to any strict requirement that it be shown to be universally followed.⁵³² Thus, for example, a new usage, if regularly observed, can be accepted as a usage of trade.⁵³³

Most importantly, trade usage evidence differs fundamentally from custom because the latter is informed by the probable intentions of the parties. As one treatise writer notes:

[A] major difference between common law custom and the Code's version of trade usage is that the former was regarded as an independent source of law, while trade usage serves only to determine the probable intent of the parties. As trade usage is evidence only of what the parties had in mind, the trier of fact may find it unpersuasive. Custom, in contrast, became a rule of law that could not be so ignored.⁵³⁴

This, of course, differs from the property conception of custom as an independent source of property rights.⁵³⁵

530. U.C.C. § 1-205 cmt., purpose 1.

531. U.C.C. § 1-205 cmt., purpose 4.

532. See, e.g., IA ANDERSON, *supra* note 528, § 1-205:43, at 325 (citing Ebasco Servs., Inc. v. Pennsylvania Power & Light Co., 460 F. Supp. 163 (E.D. Pa. 1978)).

533. See U.C.C. § 1-205 cmt., purpose 5 (stating that "[u]nder the requirement of subsection (2) full recognition is thus available for new usages").

534. 1 WILLIAM D. HAWKLAND, UNIFORM COMMERCIAL CODE SERIES § 1-205:4 (1998) (citation omitted). *But see* IA ANDERSON, *supra* note 528, § 1-205:40, at 324 (noting that some courts seem to treat custom and usage of trade as having the same meaning (citing Lipschutz v. Gordon Jewelry Corp., 373 F. Supp. 375 (S.D. Tex. 1974))).

535. See *State ex rel. Haman v. Fox*, 594 P.2d 1093, 1101 (Idaho 1979) (defining the concept of custom in property law as a usage or practice which "by common adoption and acquiescence, and by long and unvarying habit, has become compulsory, and has acquired the force of a law"); Joseph H. Levie, *Trade Usage and Custom Under the Common Law and the Uniform Commercial Code*, 40 N.Y.U. L. REV. 1101, 1102 (1965) (discussing the distinction between "custom" and "trade usage"); Note, *Custom and Trade Usage: Its Application to Commercial Dealings and the Common Law*, 55 COLUM. L. REV. 1192, 1194-95 (1955) (examining and defining custom and trade usage).

See generally Bederman, *supra* note 499 (discussing the origin and evolution of property law, particularly the notion of custom); Stephen L. Carter, *Custom, Adjudication, and Petrushevsky's Watch: Some Notes from the Intellectual Property Front*, 78 VA. L. REV. 129, 132 (1992) (commenting on Richard A. Epstein, *International News Service v. Associated Press: Custom and Law as Sources of Property Rights in News*, 78 VA. L. REV. 85 (1992)). Profes-

The utility of trade usage evidence is straightforward enough: If a practice is regularly observed in a particular industry, the parties can be assumed to have contracted with reference to it. Naturally, this calls for proof that the practice is sufficiently well known in the industry⁵³⁶ that the parties either knew or had reason to know of it.⁵³⁷ Importantly, it is not necessary that the parties are even conscious of the usage, so long as the usage is sufficiently widely observed to justify a conclusion that following the usage would be consistent with a reasonable party's expectations.⁵³⁸

Ordinarily, a trade usage will not be a matter for judicial notice, but will require proof.⁵³⁹ In repair-reconstruction cases, it seems likely that expert testimony will be necessary. In fact, expert testimony is often employed in defining trade usages.⁵⁴⁰

An important consideration for the application of trade usage to the repair-reconstruction problem concerns limitations on the persons chargeable with notice of particular trade usages.⁵⁴¹ In repair-reconstruction cases involving, for example, specialized industrial equipment, or medical devices designed for use by trained personnel, it is likely that the purchaser of the patented goods will be a sophisticated market participant, perhaps even a fellow member of the trade. Here, of course, it will be relatively easy for a court to justify the appli-

sor Carter argues that the resort to custom to establish the expectations of the parties in contract cases, or to craft "local property rules" in property cases, is problematic because both require courts to undertake "anthropological explorations" for which they may not be competent. *Id.* In the context of the repair-reconstruction dichotomy, however, the analysis of trade custom (through expert testimony) seems no more elusive (and in fact is likely to be considerably less so) than the alternative—judicial application of the spentness standard.

536. See 1A ANDERSON, *supra* note 528, § 1-205:31, at 319-20.

537. The *Restatement of Contracts* lays out similar guidelines for determining how usage may affect the scope of contractual obligations:

(1) An agreement is interpreted in accordance with a relevant usage if each party knew or had reason to know of the usage and neither party knew or had reason to know that the meaning attached by the other was inconsistent with the usage.

(2) When the meaning attached by one party accorded with a relevant usage and the other knew or had reason to know of the usage, the other is treated as having known or had reason to know the meaning attached by the first party.

RESTATEMENT (SECOND) OF CONTRACTS § 220 (1979).

538. See 1 WHITE & SUMMERS, *supra* note 529, at 132 ("[I]t is not necessary for both parties to be consciously aware of the trade usage. It is enough if the trade usage is such as to 'justify an expectation' of its observance.")

539. See 1A ANDERSON, *supra* note 528, § 1-205:22, at 316.

540. See *id.* at 317 (citing *New Hampshire Ins. Co. v. Cruise Shops, Inc.*, 323 N.Y.S.2d 352 (1971)); 1 WHITE & SUMMERS, *supra* note 529, at 140 n.39 (collecting authorities).

541. See Elizabeth Warren, *Trade Usage and Parties in the Trade: An Economic Rationale for an Inflexible Rule*, 42 U. PITTS. L. REV. 515, 523-31 (1981) (analyzing the standards for charging parties with knowledge of a trade usage in contract cases).

cation of trade usages; both patentee and purchaser can be presumed to have been familiar with the trade custom at the time of the sale. By contrast, where the product is a consumer product, the purchaser may be relatively unsophisticated and one could legitimately question in any given case whether the purchaser should be chargeable with knowledge of the trade custom.⁵⁴²

V. RESHAPING THE FEDERAL CIRCUIT'S REPAIR-RECONSTRUCTION JURISPRUDENCE USING THE IMPLIED LICENSE MODEL

The Federal Circuit should consider using an implied license model for the repair-reconstruction problem. This Part concludes by setting forth proposals for a new repair-reconstruction standard based upon the implied license model. It also proposes that the court rethink the standard of appellate review for repair-reconstruction decisions, and discusses how selected recent repair-reconstruction decisions might be analyzed if they had been decided in accordance with the proposed model.

A. *The Repair-Reconstruction Standard Restated*

To summarize the major proposals set out in preceding sections, the standard for permissible repair should be reconceived along the following lines:

(1) Replacement activities should be adjudged permissible if they fall within the scope of the purchaser's implied license to use the patented goods. The scope of the implied license to use patented goods should be determined by balancing the reasonable expectations of the patentee and the purchaser as of the time of the sale, with a primary focus on determining the scope of the patentee's apparent consent. The goal is to reconstruct the bargain that the parties would have made had they formalized an agreement. The patentee's unilateral intentions might be relevant to, but by no means would be dispositive of, the scope of the patentee's apparent consent.

(2) The reasonable expectations of the parties should be determined in view of all of the circumstances surrounding the sales trans-

542. See ANDERSON, *supra* note 528, § 1-205:14, at 314 ("In determining the sphere of operation of trade usage, a court will be influenced by the fact that a particular party is or is not a merchant who is familiar with or can be expected to be familiar with the trade usage in question."); *id.* §§ 1-205:48-49, at 327 (noting that "sophisticated" market participants are charged with knowledge of any usage of trade of which the party should be aware, while "unsophisticated" market participants, in a similar transaction, might not be charged with knowledge of the usage of trade).

action. Language from *Aro I* which appears to constrain the relevant circumstances should be repudiated.

(3) Evidence of spentness, especially evidence of the “dominance” of original over new components, and evidence as to component useful life, may be useful if it is understood as a proxy for the parties’ expectations. Accordingly, evidence of spentness should be viewed as primarily functioning to fill in gaps in the evidence on expectations.

(4) Courts should encourage the parties to submit evidence of trade custom where such evidence is needed to supplement the showing on expectations. In the ordinary case, evidence of trade custom presumably would be submitted via expert testimony.

This proposal finds little support in the *Aro I* Court’s opinion; it does, however, find some support in Justice Harlan’s dissenting opinion.⁵⁴³ While it may go too far to say that adopting this proposal requires repudiation of *Aro I* in its entirety, it is clear that this proposal diverges from the broad reasoning of *Aro I*. Ideally, then, the Supreme Court would adopt these proposals to put to rest any question of the binding effect of *Aro I*. In the meantime, the Federal Circuit might conclude that, after nearly forty years of experience with *Aro I*, it is unlikely that the Supreme Court today would follow *Aro I*’s broad reasoning, so that the Federal Circuit might consider alternatives such as the implied license model.

B. Appellate Review

If the court adopts the implied license model for repair-reconstruction analysis, the court should also revisit its statements regarding appellate review of the repair-reconstruction determination.⁵⁴⁴ Currently, the prevailing Federal Circuit view is that the repair-reconstruction determination is given plenary review.⁵⁴⁵

543. See *Aro Mfg. Co. v. Convertible Top Replacement Co.*, 365 U.S. 336, 369, 372 (1961) (Harlan, J., dissenting) (grounding the right of permissible repair in “the owner’s license to use the device[, which] carries with it an implied license to keep it fit for the use for which it was intended,” and endorsing an all-circumstances approach to repair-reconstruction). At least one other commentator has argued that the minority opinions in *Aro I* express a better view of the repair-reconstruction problem. See Hildreth, *supra* note 18, at 540 (contending “that the minority viewpoint states the superior measure of contributory infringement in the area of repair and reconstruction”).

544. See *Aro I*, 365 U.S. at 367 (Brennan, J., concurring) (reviewing the repair-reconstruction doctrine as “a question of law as to relieve appellate review from the restraints of Federal Rule of Civil Procedure 52(a)”).

545. See *Aktiebolag v. E.J. Co.*, 121 F.3d 669, 672 (Fed. Cir. 1997) (“Whether defendant’s actions constitute a permissible repair or an infringing reconstruction is a question of law which we . . . review *de novo*.” (citing *Dawson Chem. Co. v. Rohm & Haas Co.*, 448 U.S. 176,

While questions might be raised about the appropriateness of this designation under current standards, plenary review would be entirely inappropriate under the implied license model for several reasons. First, it should be noted that the assertion that the repair-reconstruction question is not a pure question of law, or is at least a conclusion of law resting upon important factual inquiries, enjoys at least some historical support.⁵⁴⁶

Second, the implied license model as set forth gives enhanced importance to the parties' expectations. The determination of expectations is a classic question for the fact-finder and should be subject only to deferential review by the Federal Circuit. Where an evidentiary gap as to reasonable expectations is filled by resort to supplemental evidence of trade custom, the determination of trade custom should also be treated as a question of fact, just as in the UCC context.⁵⁴⁷

Accordingly, the Federal Circuit should treat the repair-reconstruction determination as a mixed question of fact and law, as Justice Harlan suggested in his dissenting opinion in *Aro I*.⁵⁴⁸ Alternatively, if the court insists on retaining *de novo* review over the ultimate conclusion as to the scope of the implied license in repair versus reconstruction questions, it should acknowledge that the underlying determinations of expectations and trade custom are questions of fact subject to limited review.⁵⁴⁹ On a related point, the court should also

217 (1980))), *cert. denied*, 118 S. Ct. 1337 (1998); *Sage Prods., Inc. v. Devon Indus., Inc.*, 45 F.3d 1575, 1577 (Fed. Cir. 1995) (reviewing *de novo* "the question of whether the defendant's conduct constituted permissible repair" (quoting *Dana Corp. v. American Precision Co.*, 827 F.2d 755, 758 (Fed. Cir. 1987))).

546. Early case law in the United Kingdom proposed deferential review of the repair-reconstruction question. *See, e.g.*, *Sirdar Rubber Co. v. Wallington, Weston & Co.*, 1 Ch. 451, 452 (1905) (finding that "it is a question of fact in each case whether the work which has been done may fairly be termed a 'repair'"); *Dunlop Pneumatic Tyre Co. v. Holborn Tyre Co.*, [1901] 18 R.P.D. & T.M. 222, 226 (1901) (same).

547. *See* 1A ANDERSON, *supra* note 528, § 1-205:19, at 315. This will be particularly important if, as will likely be the case, evidence of trade custom is routinely proffered through expert testimony.

At least one court has expressed concern that if repair-reconstruction is denominated a question of fact, patent owners could more easily avoid summary judgment, and that "allowing such issues to invariably go to trial would place in the hands of the patent holders a potent weapon to use against merchants dealing in unpatented components." *Porter v. Farmers Supply Serv., Inc.*, 617 F. Supp. 1175, 1185 n.6 (D. Del. 1985), *aff'd*, 790 F.2d 882 (Fed. Cir. 1986). Although legitimate, this concern is outweighed by the need to leave issues of expectations, and credibility determinations, to the fact finder.

548. *Aro I*, 365 U.S. at 380 (Harlan, J., dissenting) (stating that "the question of 'repair' or 'reconstruction' must be a mixed question of law and fact").

549. This, of course, is the approach that courts use in reviewing obviousness determinations. *See, e.g.*, *Kolmes v. World Fibers Corp.*, 107 F.3d 1534, 1541 (Fed. Cir. 1997) (assert-

seek to resolve conflicts in the case law concerning the allocation of the burden of proof on the repair-reconstruction issue.⁵⁵⁰

C. *The Implied License Model Applied to Recent Repair-Reconstruction Decisions*

This subpart concludes by examining the differences that the implied license model might have made had it been applied in selected Federal Circuit decisions.

1. *Everpure, Inc. v. Cuno, Inc.*⁵⁵¹—Like other cases in which the replacement activity affected both worn and unworn components of a patented combination, *Everpure, Inc. v. Cuno, Inc.* is particularly vexing when analyzed under the spentness standard. These cases become

ing that “[t]he ultimate conclusion concerning obviousness, as a question of law, is reviewed *de novo*; the findings concerning the underlying factual inquiries are reviewed for clear error”).

The Federal Circuit has also taken the position that the issue of whether or not an implied license exists is a question of law. See *Met-Coil Sys. Corp. v. Korners Unlimited, Inc.*, 803 F.2d 684, 687 (Fed. Cir. 1986) (concluding that “the existence of an implied license[] is a question of law” (citing *Bandag, Inc. v. Al Bolser’s Tire Stores, Inc.*, 750 F.2d 903, 926 (Fed. Cir. 1984); *AMP Inc. v. United States*, 389 F.2d 448, 451 n.3 (Ct. Cl. 1968))). The court should revisit this issue if, in the course of restating repair-reconstruction doctrine, it decides to treat the implied license to use patented goods as an implied-in-fact contract, and to apply deferential review.

550. There is support for the proposition that the patentee bears the burden of proof on repair-reconstruction as part of the plaintiff’s general obligation to prove infringement. See *General Elec. Co. v. United States*, 572 F.2d 745, 783 n.17 (Ct. Cl. 1978) (en banc) (per curiam) (stating that the “[p]laintiff, of course, has the burden of proof on issues relating to infringement (including ‘reconstruction’)”). Cf. *Westinghouse Elec. & Mfg. Co. v. Hesser*, 131 F.2d 406, 409 (6th Cir. 1942) (discussing the possibility that where the nature of the patented combination and the circumstances of its use make it practically impossible for plaintiff to ascertain the facts concerning repair and reconstruction, the burden of proof might be shifted to the defendant); *Timken-Detroit Axle Co. v. Automotive Parts Co.*, 93 F.2d 76, 76-77 (6th Cir. 1937) (upholding the lower court’s decision to place the burden upon the defendant to prove that his intended sale of parts would not be an infringement).

On the other hand, it appears to be well established that the burden of showing the existence (and presumably the scope as well) of an implied license is on the alleged infringer. See, e.g., *Carborundum Co. v. Molten Metal Equip. Innovations, Inc.*, 72 F.3d 872, 878 (Fed. Cir. 1995) (“As the alleged infringer, [the defendant] had the burden of establishing the existence of an implied license as an affirmative defense.” (citing *Bandag*, 750 F.2d at 924)). Although sound arguments can be offered for either position, if an implied license model is adopted for repair-reconstruction, it seems preferable to place the burden of proof as to repair-reconstruction on the alleged infringer. In an analysis featuring the balance of expectations, neither party is necessarily in a better position than the other to have access to relevant facts. In addition, placing the burden on the defendant would appear to harmonize repair-reconstruction law with the law for implied licenses generally.

551. 875 F.2d 300 (Fed. Cir. 1989). For a synopsis, see *supra* notes 279-287 and accompanying text.

relatively easy cases under the implied license model. Rather than perplexing itself with a difficult analysis of old versus new components, the court could begin by assessing the parties' reasonable expectations, focusing particularly on the extent of replacement activities to which the patentee reasonably consented. In *Everpure*, the evidence that the patentee instructed users to change the cartridge⁵⁵² (with its sealed-in filter) on the device at issue evidences the patentee's reasonable consent to regular replacement of the cartridge. Moreover, there was no evidence that the patentee demanded that the purchaser buy the replacement cartridges exclusively from the patentee. A purchaser would reasonably have expected to be able to purchase the cartridges from any source, and, of course, any necessary adapter to mate the cartridge to the head. In this analysis, there is no need for the court to resort to the fiction that the entire cartridge is "effectively" spent when the filter wears out. Indeed, the physical qualities of the device are relevant only insofar as they confirm that the patentee and purchaser would reasonably have expected that the entire cartridge would be replaced when the filter wore out. That is, the physical qualities of the device are relevant only to supplement other evidence as to expectations and the scope of consent.

2. *Kendall and Sage Products*.⁵⁵³—*Kendall, Sage Products*, and other cases in which the patentee applies a "single-use-only" label to the patented goods would also become easier under an implied license model. Like *Everpure*, these cases were difficult under the spentness standard because the replaced component was not physically worn out at the time of replacement, yet component replacement seemed prudent and deserving of protection from liability. Instead of straining to conclude that component spentness could occur when it was impractical or infeasible to continue to use a component, the court could turn instead to an analysis of the scope of the patentee's reasonable consent. Under such a regime, the patentee in *Sage Products*, for example, would undoubtedly have argued that the "single-use-only" label on Sage's inner container for sharps evidenced Sage's reasonable consent exclusively to what the label says—single use of the inner container. The alleged infringer, Devon Products, could then have responded that reasonable purchasers would not under-

552. See *Everpure*, 875 F.2d at 303.

553. *Kendall Co. v. Progressive Med. Tech., Inc.* 85 F.3d 1570 (Fed. Cir. 1996); *Sage Prods., Inc. v. Devon Indus., Inc.* 45 F.3d 1575 (Fed. Cir. 1995). For a synopsis, see *supra* notes 288-296, 297-304 and accompanying text.

stand Sage's label to constitute a demand that purchasers buy replacement inner containers exclusively from Sage.

Evidence of customary practice in the medical device industry, offered to supplement the evidence on reasonable expectations, might well be useful here. Suppose, for example, that expert testimony demonstrated that it was customary practice, well-known to medical device suppliers like the patentee, for hospitals to purchase replacement components for medical devices from replacement parts suppliers. The court would be justified in concluding that when Sage sold a patented sharps disposal device, the purchase price reflected Sage's reasonable expectation that the purchaser might well go elsewhere to purchase replacement inner containers.

3. *FMC*.⁵⁵⁴—The implied license model does not, of course, provide a pat answer for the *FMC* case or other cases raising the issue of sequential replacement activities. Instead, its primary benefit in such cases is to avoid the riddle of the apocryphal axe. Presumably, the *FMC* opinion would look very different if an expectations analysis were the principal focus. The elaborate "economic" approaches to spentness (enunciated by the district court) would be relevant only to the extent of filling in gaps in the evidence as to reasonable expectations. Given this limited relevance, and the inevitable entanglement of the "economic approaches" with the problem of the apocryphal axe, one wonders whether courts would consider the economic approaches to be worth the effort in an implied license model.

Evidence of customary practice in the trade might be a particularly valuable tool in sequential replacement cases. For example, in *FMC*, the parties might have introduced evidence, derived from customary practices in the grape harvester industry, tending to establish a routine replacement schedule for grape harvester components. Such a schedule could be highly relevant under an implied license model to the extent that it revealed the probable understanding of seller and purchaser about which components would routinely be replaced, and how frequently, before any additional royalty obligation would be triggered.

In the end, resort to the implied license model in a case like *FMC* may not avoid all of the problems associated with the spentness standard, but it would establish an analytical framework that courts might

554. *FMC Corp. v. Up-Right Inc.*, 21 F.3d 1073 (Fed. Cir. 1994). For a synopsis, see *supra* notes 347-371 and accompanying text.

find more palatable, in which the cumbersome spentness standard would play, at most, a limited role.

4. Hewlett-Packard.⁵⁵⁵—The implied license model would not make the *Hewlett-Packard* case any easier. In fact, it might demonstrate that the case was an uncomfortably close call. The record would have to be supplemented to allow for any sensible analysis of the scope of Hewlett-Packard's reasonable consent to the modification or refilling of its patented inkjet cartridges, but it seems likely that Hewlett-Packard would have been able to make a fairly persuasive case that defendant Repeat-O-Type's modifications fell outside the ambit of the reasonable expectations of Hewlett-Packard and its purchasers at the time of initial sale. While Hewlett-Packard's attempts to show its unilateral intentions as to the design of the cartridge would be given little weight under the implied license model just as they were in the actual case, Hewlett-Packard's instructions to users to discard old cartridges may at least have raised a genuine issue of material fact as to whether a purchaser would reasonably have expected to be allowed to make the modifications at issue.⁵⁵⁶

555. *Hewlett-Packard Co. v. Repeat-O-Type Stencil Mfg. Corp.*, 123 F.3d 1445 (Fed. Cir. 1997), *cert. denied*, 118 S. Ct. 1304 (1998). For a synopsis, see *supra* notes 273-277 and accompanying text.

556. Some would argue that elevating reasonable expectations to the fore in the repair-reconstruction analysis will simply encourage patentees to contract around repair-reconstruction by attaching express conditions to the purchase of goods. Antitrust restrictions—especially in the form of restrictions against tying as embodied in current patent misuse doctrine—will presumably be available where patentees employ anticompetitive express restrictions. See James B. Kobak, Jr., *Contracting Around Exhaustion: Some Thoughts About the CAFC's Mallinckrodt Decision*, 75 J. PAT. & TRADEMARK OFF. SOC'Y 550, 564 (1993) (questioning whether the *Mallinckrodt* decision might "render almost meaningless the distinction between repair . . . and reconstruction" as patentees resort to express reuse restrictions, and worrying that the result will be a more limited right of permissible repair for purchasers).

However, it is difficult to tell why this should be worrisome. If the express restrictions do no more than express the patentee's unilateral intentions, they will not weigh heavily in the expectations analysis for permissible repair and thus they will not render meaningless the repair-reconstruction distinction. The express restrictions might, of course, go further, amply demonstrating the patentee's intention that, for example, a particular component in a patented combination be used only once *and* that the purchaser deal exclusively with the patentee in purchasing replacement parts. If so, and the purchaser had notice of the restriction at the time of purchase but willingly paid the asking price anyway, then it is difficult to see why the law should have great sympathy for the purchaser. The purchaser has, perhaps, contracted away some or all of the purchaser's permissible repair right, but this should not be considered problematic, absent a violation of antitrust principles. This last qualification is a substantial one, and a full discussion of it is outside the scope of this paper. For a discussion of the antitrust aspects of *Mallinckrodt*, see Kobak, *supra*, at 559-65; Richard H. Stern, *Post-Sale Restrictions After Mallinckrodt: An Idea in Search of Definition*, 5 ALB. L.J. SCI. & TECH. 1 (1994).

At the very least, the implied license model would have been beneficial in *Hewlett-Packard* because it would have provided a role for evidence of expectations. It would have allowed the court to embrace an intent-oriented analysis without resting its decision solely on the patentee's unilateral intentions.

5. *Conclusion.*—In one sense, the implied license model for repair-reconstruction is not radical. Indeed, even if the Federal Circuit had decided every repair-reconstruction case in accordance with the implied license model as outlined, it is doubtful that there would be any dramatic shift in case outcomes.⁵⁵⁷

In another sense, however, the implied license model turns repair-reconstruction jurisprudence upside down. Instead of establishing the highly artificial notion of “spentness” or even “effective spentness” as the analytical focus, and attempting to funnel all relevant facts (i.e., those concerning the physical qualities of the device and, possibly, the intentions of the parties) towards it, an implied license model establishes the parties' expectations as the focus. Spentness is then relevant only to the extent that it bears on the ultimate goal of proving the scope of the patentee's apparent consent, defined in terms of expectations.

The implied license model is preferable because the expectations analysis is more familiar to courts, and finds antecedent in other areas of the law, providing a ready-made jurisprudence to which courts confronting repair-reconstruction problems may look. For example, courts may appropriate established notions of trade usage as developed in contract law in order to evidence probable expectations in the repair-reconstruction context. The implied license model also encourages a flexible, all-circumstances approach to resolving repair-reconstruction problems. Finally, the implied license model, by emphasizing an expectations analysis, relieves courts from resting their infringement determinations solely or even primarily on insoluble riddles like that of the apocryphal axe. With all due respect to Webster and Seward, it is time to move ahead from *Wilson v. Simpson*.

557. Perhaps this is because courts have actually been reaching for an implied license approach to repair-reconstruction, while straining under the encumbrances of the spentness rhetoric.