

A CASE STUDY OF INOPERABLE INVENTIONS: WHY IS THE USPTO PATENTING PSEUDOSCIENCE?

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I. INTRODUCTION

A. *The Problem of Inoperable Inventions*

In 1996, a district court granted the United States a permanent injunction against the Quadro Corporation, enjoining Quadro from selling a class of devices variously called the Quadro Tracker, Golfball Gopher, Trailhook, or Treasure Hunter.¹ The marketing literature for these devices claimed that they could detect unseen objects by directing the bearer of the device in the correct direction, much like a dowsing rod acts to conduct its bearer towards water.² For example, it claimed that the Quadro Tracker was capable of detecting contraband such as illegal drugs and explosives.³ X-rays of the device determined that it consisted of nothing more than a hollow plastic shell with an attached radio antenna.⁴ Thus, like the classic dowsing rod, the Quadro Tracker was incapable of detecting anything.⁵ The primary victims of this fraud were law-enforcement agencies, correctional institutions, and school systems.⁶

Enter DKL International, Inc.⁷ DKL markets a very expensive, handheld device called the DKL LifeGuard⁸—purported to be capable of detecting living humans at a distance—to government agencies worldwide.⁹ Like the Quadro Tracker, the DKL LifeGuard fails to function as claimed.¹⁰ Why then is DKL International allowed to market its detectors while the Quadro Corporation is enjoined from selling similar devices? One possible explanation is that the DKL LifeGuard,

1. U.S. v. Quadro Corp., 928 F. Supp. 688, 699 (E.D. Tex. 1996), *aff'd*, 127 F.3d 34 (5th Cir. 1997).

2. *Id.* at 691-92. “Dowsing” is an ancient practice whereby a person holding an L-shaped rod or stick attempts to locate a hidden target, usually water. Wikipedia, Dowsing, <http://en.wikipedia.org/wiki/Dowsing> (last visited Nov. 1, 2006). Practitioners of dowsing consistently fail to locate hidden objects with greater accuracy than expected by chance when tested under controlled conditions. *Id.*

3. *Quadro Corp.*, 928 F. Supp. at 690.

4. *Id.* at 692.

5. *See id.*

6. *Id.* at 690.

7. DKL International, Inc., Welcome to DKL, <http://www.dklabs.com> (last visited Nov. 1, 2006).

8. DKL International, Inc., Products, <http://www.dklabs.com/products.html> (last visited Nov. 1, 2006). Models range in price from \$6,000 to \$15,000. Kendrick Frazier, ‘Human Presence Detector’ Device Fails Controlled Tests at National Laboratory, THE SKEPTICAL INQUIRER, July-Aug. 1998, at 8.

9. *See* DKL International, Inc., Customers, <http://www.dklabs.com/customers.html> (last visited Nov. 1, 2006).

10. *See infra* Part IV.A.

unlike the Quadro devices, is covered by no less than eight patents.¹¹ The existence of the DKL patents raises a number of questions: What effect have these patents had on DKL's success in marketing their product? What flaw in the patent-examining process allowed these patents to be issued in the first place? More importantly, can the issuance of such patents be prevented in the future, and at what cost?

The U.S. patent system has endured criticism over the years for a number of perceived failures to protect both the consumer and the industries that rely on patent protection.¹² Criticisms include (1) overly broad patent protections,¹³ (2) grants of patent rights for clearly obvious inventions,¹⁴ (3) windfalls to inventors after long application delays (the so-called submarine patents),¹⁵ and (4) grants of patents for marginally useful (or even silly) innovations.¹⁶ Other criticisms arise from particular technological fields. For example, with respect to the pharmaceutical industry, critics often take issue with the requirement that chemical compounds have some recognized commercial utility before they can be patented.¹⁷

This Comment addresses a criticism that often arises in the scientific community—but which is given scant attention in law reviews—the issuance of patents which have theories of operation that rest on clearly pseudoscientific principles.¹⁸ From a legal perspective,

11. U.S. Patent No. 5,748,088 (filed Nov. 27, 1996); U.S. Patent No. 5,907,280 (filed Apr. 28, 1997); U.S. Patent No. 6,011,476 (filed Aug. 25, 1997); U.S. Patent No. 6,078,179 (filed Apr. 24, 1997); U.S. Patent No. 6,411,099 (filed Mar. 29, 2000); U.S. Patent No. 6,496,114 (filed Jan. 21, 1999); U.S. Patent No. 6,674,366 (filed May 4, 1998); U.S. Patent No. 6,686,842 (filed May 4, 1998).

12. See, e.g., Symposium, *Ideas into Action: Implementing Reform of the Patent System*, 19 BERKELEY TECH. L.J. 857 (2004).

13. See, e.g., U.S. Patent No. 5,960,411 (filed Sept. 12, 1997) (Amazon.com's patent for "one-click" shopping); Elizabeth Jackson, Amazon.com, Inc. v. barnesandnoble.com, Inc.: *The Custody Battle Over "1-Click" Shopping: Web Customers Win Control*, 10 U. BALT. INTELL. PROP. L.J. 55, 58-59 (2001).

14. See, e.g., U.S. Patent No. 6,080,436 (filed June 14, 1999) (patenting a method of "refreshing a bread product by heating"—that is, making toast).

15. Most famously, inventor Jerome Lemelson extracted about \$1.5 billion in licensing fees using submarine patents for such everyday items as bar-code readers. See Susan Hansen, *Breaking the (Bar) Code*, IP L. & BUS., Mar. 2004, at 41, 42.

16. See, e.g., U.S. Patent No. 6,213,778 (filed Dec. 14, 1999) (describing a method of creating art prints by dipping a baby's posterior in paint and transferring the image to paper).

17. See, e.g., Eric P. Mirabel, *"Practical Utility" Is a Useless Concept*, 36 AM. U. L. REV. 811, 812-14 (1987); Phanesh Koneru, *To Promote the Progress of Useful Artficle[s]: An Analysis of the Current Utility Standards of Pharmaceutical Products and Biotechnological Research Tools*, 38 IDEA 625, 648 (1998).

18. See, e.g., John H. Barton, *Reforming the Patent System*, 287 SCI. 1933, 1934 (2000); David Voss, *'New Physics' Finds a Haven at the Patent Office*, 284 SCI. 1252, 1252-54 (1999).

these patents involve a narrow class of inventions that are so devoid of utility as to be completely incapable of operating as claimed—so-called inoperable inventions.¹⁹ Some examples might help illustrate the scope of this criticism: a method of controlling appliances with the mind alone,²⁰ a magnetic ring that helps circulate the blood,²¹ a device for imparting something like the Chinese spiritual energy called “Ki” into water,²² an antigravity spaceship,²³ and a perpetual motion motor that runs on the power of permanent magnets.²⁴ Later, this Comment will analyze several patents within this class in detail to point out flaws in the patenting system and to explain why the United States Patent and Trademark Office (USPTO) issued such patents in the first place.²⁵

B. *Response to Arguments Against Reform*

There are four primary arguments against reforming the patent system to prevent the patenting of inoperable inventions. First, if inoperable inventions are useless by definition, no market—and therefore no harm to consumers—can arise from such patents.²⁶ Second, might some inoperable inventions actually prove to be not only functional, but exceptionally visionary?²⁷ Denying patents to every incredible invention may stifle innovation in these rare cases. Third, if a patentee submits an application for an inoperable invention knowing that it will not be tested, then the problem is simply one of fraud or inequitable conduct,²⁸ rather than a systematic flaw in the patent

19. Although the legal and colloquial definitions of “inoperable” are similar, the legal definition implies a heightened standard of proof in demonstrating that the invention completely fails to operate as claimed. *See infra* Part II.B.

20. U.S. Patent No. 5,830,064 (filed July 19, 1996).

21. U.S. Patent No. 5,989,178 (filed Apr. 2, 1997).

22. U.S. Patent No. 5,247,179 (filed Oct. 17, 1991).

23. U.S. Patent No. 6,960,975 (filed Mar. 14, 2005).

24. U.S. Patent No. 4,151,431 (filed Dec. 6, 1973).

25. *See* discussions *infra* Part IV.

26. *See, e.g.*, ROBERT PATRICK MERGES & JOHN FITZGERALD DUFFY, PATENT LAW AND POLICY: CASES AND MATERIALS 216 (3d ed. 2002) (posing this argument and positing the possibility of fraud as a possible counterargument).

27. Although beyond the scope of this Comment, this argument presupposes the much criticized theory that scientific advances occur through revolutionary innovations toward which the conservative scientific establishment is usually hostile. *See* THOMAS S. KUHN, THE STRUCTURE OF SCIENTIFIC REVOLUTIONS 159-72 (1962).

28. Inequitable conduct is a broader form of common-law fraud committed against the USPTO. *See* J.P. Stevens & Co. v. Lex Tex Ltd., 747 F.2d 1553, 1559 (Fed. Cir. 1984) (“[Inequitable conduct includes] failure to disclose material information, or submission of false material information, with an intent to mislead.”).

system.²⁹ The fourth argument blames inoperable patents on individual examiners, thus avoiding implicating the system as a whole.³⁰

1. PATENTING INOPERABLE INVENTIONS HARMS CONSUMERS

In response to the argument that inoperable inventions are not marketable, counterexamples abound. For example, the founder and CEO of Biomed Comm, Inc., Dr. Barbara Brewitt, has received five U.S. patents relating to homeopathic treatments.³¹ The patents were the basis for Biomed Comm's entry into the thriving market for homeopathic remedies.³² Homeopathy, although popular as a treatment, has proven to be both inefficacious and scientifically implausible.³³ In 2004, the Iowa Supreme Court affirmed a default judgment against New Womyn, Inc. under a state consumer fraud statute.³⁴ New Womyn's president, Dan Kaiser, had been marketing a patented device to enlarge women's breasts using a suction pump.³⁵ In one particularly egregious case,³⁶ DKL International continues to market patented devices for long-distance detection of human beings to local, state, and federal agencies, despite the fact that scientists at Sandia National

29. See 37 C.F.R. § 1.56(a) (2006) ("Each individual associated with the filing and prosecution of a patent application has a duty of candor and good faith in dealing with the [USPTO], which includes a duty to disclose to the [USPTO] all information known to that individual to be material to patentability . . .").

30. See *infra* Part III.A for a discussion of the educational background of patent examiners.

31. U.S. Patent No. 5,626,617 (filed Dec. 20, 1995); U.S. Patent No. 5,629,286 (filed Sept. 10, 1996); U.S. Patent No. 6,024,734 (filed May 13, 1997); U.S. Patent No. 6,239,105 (filed Feb. 17, 1999); U.S. Patent No. 6,485,480 (filed Feb. 7, 2000). See *infra* note 33 and accompanying text for an explanation of homeopathy.

32. See Press Release, Biomed Comm, Inc., U.S. Patent Allowance Awarded, 1997 (Summer 1997), http://www.biomedcomm.com/store/media_summer97.html.

33. See Patrick L. Sheldon, *The Truth About Homeopathy: A Discussion of the Practice and the Dangers that Inhere*, 8 QUINNIPIAC HEALTH L.J. 289, 316-17 (2005) for a summary of scientific trials of homeopathic remedies. Homeopathy is scientifically implausible in that it adheres to the Law of Infinitesimals, the theory that solutions become more potent the more they are diluted. *Id.* at 314-15. Simple application of the laws of chemistry reveals that homeopathic remedies are routinely diluted to the point that they do not contain even a single molecule of the active ingredient. *Id.* For a defense of homeopathy, see National Center for Homeopathy, *What Are the Medicines?*, <http://www.homeopathic.org/meds.htm> (last visited Nov. 1, 2006).

34. *State v. New Womyn, Inc.*, 679 N.W.2d 593, 594 (Iowa 2004).

35. *Id.*; U.S. Patent No. 6,042,537 (filed Aug. 13, 1997).

36. See discussion *supra* Part I.A.

Laboratories have determined that these devices are useless (that is, they are nothing more than very expensive dowsing rods).³⁷

Yet even where no marketable product exists, the possibility of the patent owner defrauding investors remains a real possibility.³⁸ A patent can lend an air of “official recognition by the U.S. government” to an inoperable invention that may help lure less-sophisticated investors into backing a nonexistent product slated to appear at some future date.³⁹ As the court in *In re Citron* observed, “it is against public policy to place the oblique imprimatur of the Government via the patent grant on incredible or misleading unproven assertions in view of the possibility of exploitation of such statements in issued patents by unscrupulous persons.”⁴⁰

The existence of a patent on an inoperable invention increases the harm to the consumer or investor because of the public perception that patented inventions are superior to unpatented ones.⁴¹ Part of the problem may be that the public believes that inoperable inventions are unpatentable and, therefore, that the USPTO does not issue patents to such inventions.⁴² This perception is only partially correct. As discussed in more detail later, an inoperable invention is indeed technically unpatentable, yet the USPTO often fails to deny the patent.⁴³ Like it or not, the public depends on the USPTO to provide some measure of protection against consumer products that do not work as claimed.⁴⁴ Suggesting that the problem should be solved by reeducating the public about the limitations of the patent system is akin to suggesting that problems in the drug approval process be solved by asking consumers to be more skeptical of Food and Drug Administration approval.

37. See *infra* Part IV.A.

38. MERGES & DUFFY, *supra* note 26, at 216.

39. *Id.*

40. 325 F.2d 248, 253 (C.C.P.A. 1963).

41. DAVID PRESSMAN, PATENT IT YOURSELF 10 (11th ed. 2005) (stating that people think “[i]f a product has been patented, it’s bound to be superior”).

42. See MERGES & DUFFY, *supra* note 26, at 216.

43. See *infra* Part II.

44. Bonnie Grant, Note, *Deficiencies and Proposed Recommendations to the False Marketing Statute: Controlling Use of the Term ‘Patent Pending,’* 12 J. INTELL. PROP. L. 283, 295 (2004) (noting that although there are no scientific studies on the effects of patenting on consumers, they may see the patent as an endorsement by the USPTO that the product is useful).

2. INCREASED SCRUTINY OF PATENTS WILL NOT STIFLE INNOVATION

The potential problem of stifling innovation by denying patents to revolutionary ideas that might seem incredible at the time involves two separate inquiries. First, is it even possible to define inoperability with objective certainty? That is, is the determination of inoperability objective fact or purely subjective opinion? This Comment presumes that the physical sciences (for example, physics and chemistry) are sufficiently well-established that one can generally make a de facto determination of whether or not an invention will work from a direct application of the laws of nature. Thus, one skilled in the art of physics should immediately recognize that a spaceship propelled by a “gravitomagnetic field” cannot fly⁴⁵ or that a motor powered only by permanent magnets cannot turn indefinitely.⁴⁶ In other fields, such as human physiology, determination of inoperability is not as precise.

Objections to the theory of operation are necessarily more complex in the biological sciences than in the physical sciences, where theories are reducible to mathematical laws. Although many scientists strongly suspect rubbing sauerkraut juice on the skin is unlikely to cure arthritis,⁴⁷ the complexity of human physiology often leaves skeptics with a scintilla of doubt. On the other hand, certain theories—such as therapeutic touch (a poorly named therapy that involves touching only the patient’s “energy field”),⁴⁸ homeopathy (a therapy involving consumption of essentially pure water or alcohol),⁴⁹ and Reiki (another “energy field” therapy)⁵⁰—can be tested for efficacy with relative certainty using carefully constructed statistical tests.⁵¹ In order to avoid undue complexity in the analysis, this Comment will focus on

45. U.S. Patent No. 6,960,975 (filed Mar. 14, 2005). See Philip Ball, *Antigravity Craft Slips Past Patent Officers*, 438 NATURE 139, 139 (2005) (noting that the invention is based on discredited research purporting to show that superconductors can shield the effects of gravity).

46. U.S. Patent No. 4,151,431 (filed Dec. 6, 1973). This is a classic example of a perpetual motion machine discussed *infra* Part IV.B.

47. See, e.g., *In re Milligan*, 41 U.S.P.Q.2d (BNA) 1703, 1703-04 (Fed. Cir. 1996).

48. See Official Organization for Therapeutic Touch, *The Therapeutic Touch Process*, <http://www.therapeutic-touch.org/newsarticle.php?newsID=19> (last visited Nov. 1, 2006); Linda Rosa et al., *A Close Look at Therapeutic Touch*, 279 JAMA 1005 (1998).

49. See *supra* note 33 and accompanying text.

50. See, e.g., The International Center for Reiki Training, *What Is Reiki?*, <http://www.reiki.org/FAQ/WhatIsReiki.html> (last visited Nov. 1, 2006).

51. See, e.g., Rosa et al., *supra* note 48, at 1007-09 (recounting a study conducted by a nine-year-old girl concluding that therapeutic touch practitioners were unable to sense the presence of a human “energy field” under controlled conditions).

inventions in the field of physics, where operability can often be determined as an objective fact using fundamental and universally accepted scientific principles.⁵²

The second inquiry in determining if a crackdown on inoperable patents would stifle innovation is to ask whether more skepticism on the part of the USPTO would stifle innovation in practice. The history of attempts to patent baldness cures illustrates both that innovation continues to occur despite previous patent rejections and that the patent system can adjust to scientific advances.⁵³ At one time, the public thought that baldness cures were inherently incredible,⁵⁴ thus creating an institutional bias against attempts to patent such cures. By 1999, the Federal Circuit concluded that curing baldness was no longer an incredible proposition, noting that many drugs are now recognized to be effective in treating the condition.⁵⁵ Thus, when baldness cures evolved from pseudoscientific wishful thinking to effective FDA-approved medications, the USPTO adjusted its opinion. Innovation occurred despite the USPTO's skepticism, and in the interim the USPTO protected the public, at least in theory,⁵⁶ from an onslaught of ineffective baldness cures.⁵⁷

3. PATENTEES ARE ONLY PARTIALLY TO BLAME

As to the argument that applications to patent inoperable inventions are simply the result of inequitable conduct by the patentee, such practices do undoubtedly occur. Patent lawyers have been known to manipulate the claims or the patenting procedure to avoid an

52. See discussion of *Newman v. Quiggs*, *infra* Part II.B, for an example of a court applying objective scientific principles.

53. See, e.g., *In re Cortright*, 165 F.3d 1353, 1357 (Fed. Cir. 1999).

54. *In re Ferens*, 417 F.2d 1072, 1074 (C.C.P.A. 1969); *In re Oberweger*, 115 F.2d 826, 829 (C.C.P.A. 1940).

55. *In re Cortright*, 165 F.3d at 1357.

56. Curiously, the court mentioned that "approximately one hundred patents" for curing baldness had already been issued at the time *In re Cortright* first came before the court. *Id.* The USPTO issued these patents despite the fact that this was the first case to overrule the institutional skepticism towards baldness cures, suggesting that even institutional skepticism is not an effective deterrent against issuing patents to inoperable inventions.

57. In fact, the term "patent medicine" is synonymous with the ineffective or dangerous medications marketed before the Pure Food and Drug Act of 1906. See Wikipedia, Patent Medicine, http://en.wikipedia.org/wiki/Patent_medicine (last visited Nov. 1, 2006). For a detailed history of the patent medicine era in America, see JAMES HARVEY YOUNG, *THE TOADSTOOL MILLIONAIRES: A SOCIAL HISTORY OF PATENT MEDICINES IN AMERICA BEFORE FEDERAL REGULATION* (1961); JAMES HARVEY YOUNG, *THE MEDICAL MESSIAHS: A SOCIAL HISTORY OF HEALTH QUACKERY IN TWENTIETH-CENTURY AMERICA* (1992).

inoperability rejection.⁵⁸ However, there is anecdotal evidence that the inventors themselves often genuinely believe that their invention does what it claims.⁵⁹ Thus, at least from the inventor's perspective, the incentive to avoid inequitable conduct does not exist.

4. THE PROBLEM IS BOTH LEGAL AND INSTITUTIONAL

Finally, is the granting of patents to inoperable inventions the result of occasional human error? Or is it, instead, a symptom of a weakness in current case law or institutional problems with the USPTO? The rest of this Comment argues that the problem is indeed a legal and institutional one and suggests some possible solutions. To borrow a phrase from science, the problem appears to be systematic rather than random. Part II summarizes the current law with respect to rejection of patents for inoperability. Part III explores the law-in-action reasons that patent examiners sometimes fail to recognize or react to an inoperable invention. Part III also discusses the current procedures for patent reexamination and why they are unsuitable for after-the-fact inoperability rejections. Part IV looks at a number of patents and patent appeals in detail in an attempt to uncover the strengths and weaknesses of the current system with regard to inoperable inventions. Finally, Part V suggests some possible improvements to the current system that may help reduce the number of inoperable inventions receiving patent protection.

II. THE LEGAL STANDARD FOR REJECTING INOPERABLE INVENTIONS

A. *Inoperability and the Substantive Law of Utility*

In the context of patents, the concept of utility derives directly from the Constitution, which gives to Congress the power to promote the "useful Arts" by the granting of patents.⁶⁰ From there, Congress figuratively cut-and-pasted the word "useful" into Title 35 of the U.S. Patent Code, which allows patents only for a "new and useful process,

58. See Voss, *supra* note 18, at 1252-53 (noting that, after nuclear science examiners initially rejected a "cold fusion" patent, the patent attorney directed it toward the electrochemistry examiners, who accepted it); *infra* Part IV.B (giving an example of how an applicant drafted a patent to avoid the taint of "perpetual motion").

59. For example, dowsing, the apparent theory of operation behind the DKL LifeGuard device, appears to work precisely because the operator believes in its efficacy. James Randi, *The Matter of Dowsing*, 2 SWIFT 4, 4-5 (1998), available at <http://www.randi.org/pdf/swift2-34.pdf>.

60. U.S. CONST. art. I, § 8, cl. 8.

machine, manufacture or composition of matter, or any new and useful improvement thereof.”⁶¹ Rather than bear the onerous burden of deciding usefulness on a case-by-case basis, early courts sought to construct a legal definition of “useful,” beginning with a moral prescription that useful inventions “should not be frivolous or injurious to the well-being, good policy, or sound morals of society.”⁶² The two-hundred-year common-law development of a legal definition of “useful” has resulted in the modern concept of “utility.”⁶³

Modern utility standards are less concerned with morality⁶⁴ than with the finely parsed meaning of words (such as “practical,” “substantial,” and “specific”) as they apply to utility.⁶⁵ Fortunately, the modern requirement of utility still includes the common-sense notion that an invention that does not work as claimed (that is, one that is inoperable) cannot be useful for purposes of patentability.⁶⁶ Most of the modern refinement of the utility concept⁶⁷ arises from what appear to be honest and sober attempts to realistically state what the invention actually does. For example, the “specific utility” requirement arose from an attempt to patent compounds whose actual medical uses had not yet been determined.⁶⁸ The inventors in *In re Kirk* honestly claimed that their compounds exhibited “biological activity” but gave no specific medical uses in their patent application.⁶⁹ By contrast, the inventions examined in this Comment often make wildly fantastic claims of usefulness. For example, there can be no doubt that a table-top apparatus constructed out of everyday materials and capable of

61. 35 U.S.C. § 101 (2000).

62. *Lowell v. Lewis*, 15 F. Cas. 1018, 1019 (1817) (“All that the law requires is, that the invention should not be frivolous or injurious to the well-being, good policy, or sound morals of society.”).

63. For a lament on how far courts have strayed from the dictionary definition of “useful,” see Mirabel, *supra* note 17, at 814. For a defense of the courts, see *Brenner v. Manson*, 383 U.S. 519, 529 (1966). In referring to the word “useful,” the court notes that “a simple, everyday word can be pregnant with ambiguity when applied to the facts of life.” *Id.*

64. See *Juicy Whip, Inc. v. Orange Bang, Inc.*, 185 F.3d 1364, 1366-67 (Fed. Cir. 1999) (containing a discussion of the history of moral interpretations of “useful”).

65. See Mirabel, *supra* note 17, at 813-14.

66. *In re Harwood*, 390 F.2d 985, 989 (C.C.P.A. 1968) (“An inoperative invention, of course, does not satisfy the requirement of 35 U.S.C. section 101 that an invention be useful.”).

67. For a recent summary of the modern law of utility, see *In re Fisher*, 421 F.3d 1365, 1370-71 (Fed. Cir. 2005).

68. *In re Kirk*, 376 F.2d 936, 942-46 (C.C.P.A. 1967); see also *In re Fisher*, 421 F.3d at 1379 (upholding a rejection for specific utility for genetic markers called express sequence tags).

69. *In re Kirk*, 376 F.2d at 939.

generating infinite amounts of free energy would satisfy every legal requirement of utility if it actually worked.⁷⁰ In cases like this, the questions of utility are existential rather than teleological.

Though rare, cases where courts have addressed the existential question of whether an invention is within the realm of possibility do exist. For example, in *In re Citron*, the court said that a claimed cure for cancer appeared “incredible in the light of the knowledge of the art, or factually misleading.”⁷¹ In *In re Milligan*, the court found that a claim that rubbing sauerkraut juice on one’s skin effected a cure for arthritis was “incredible on its face.”⁷² Baldness cures,⁷³ cold fusion,⁷⁴ and antiaging methods⁷⁵ have all been deemed—at one time or another—to be beyond the realm of current technology.

One problem with operability rejections arises from the fact that one must often make a judgment as to the proper application of scientific principles. Questions concerning the application of scientific principles are not legal abstractions that courts are willing to incorporate into case law, but rather evidentiary issues that concern only the trier of facts.⁷⁶ Judges and juries are not expected to be scientific experts,⁷⁷ and rightly so. Thus courts, being populated by lawyers rather than scientists, generally avoid making a violation of a well-established scientific principle dispositive in determining the nonutility of a patent.⁷⁸

The case of *Newman v. Quigg* illustrates the restraint of courts in directly applying scientific principles as a matter of law.⁷⁹ The invention in *Newman* involved a machine, which inventor Joseph Newman claimed to have “an energy output greater than the energy input” apparently caused by “gyroscopic type energy particles.”⁸⁰ The

70. See *infra* Part IV.B-C.

71. 325 F.2d 248, 253 (C.C.P.A. 1963).

72. 41 U.S.P.Q.2d (BNA) 1703, 1703 (Fed. Cir. 1996).

73. *In re Ferens*, 417 F.2d 1072, 1074 (C.C.P.A. 1969).

74. *In re Swartz*, 232 F.3d 862, 864 (Fed. Cir. 2000).

75. *In re Eltgroth*, 419 F.2d 918, 918-20 (C.C.P.A. 1970).

76. *Brooktree Corp. v. Advanced Micro Devices, Inc.*, 977 F.2d 1555, 1573 (Fed. Cir. 1992).

77. *Id.*

78. *Newman v. Quigg*, 877 F.2d 1575, 1578 (Fed. Cir. 1989).

79. See *id.*

80. *Id.* at 1577. The *Newman* case became a cause célèbre among conspiracy theorists after Newman appeared on the *CBS Evening News* on January 11, 1984. ROBERT L. PARK, *VOODOO SCIENCE: THE ROAD FROM FOOLISHNESS TO FRAUD* 5 (2000). His patent rejection eventually attracted the attention of several members of Congress, who held hearings to determine whether or not to force the USPTO to grant Newman a patent. *Id.* at 102-05. Unfortunately, Newman withered under the questioning of

Board of Patent Appeals and Interferences called the device a “perpetual motion machine” in violation of the laws of thermodynamics.⁸¹ The National Bureau of Standards ultimately tested the device and determined that it produced less energy than it took in.⁸² Although the appeals court refused, for technical reasons,⁸³ to rule on the question of whether a violation of the laws of thermodynamics barred issuance of a patent, the court did state that it “believe[d] that the laws of thermodynamics do not brook contradiction. However, the laws of thermodynamics do not require closing of either the scientific or the judicial mind to the possibility that the phenomena manifested can be explained by theories that do not violate inviolable scientific principles.”⁸⁴ Thus, violation of the laws of nature merely provides evidence of nonutility, and, in fact, inventors of perpetual motion machines often postulate speculative internal sources of energy to overcome the thermodynamic argument.⁸⁵

Another difficulty with inoperability rejections is that, as a matter of substantive law, the bar is set relatively low for establishing that an invention functions according to its claims.⁸⁶ Perfect operation of the invention as claimed is not a requirement for utility.⁸⁷ In fact, “a small degree of utility is sufficient . . . the defense of non-utility cannot be sustained without proof of total incapacity.”⁸⁸ Would a spaceship powered by a “gravitomagnetic field”⁸⁹ satisfy the utility requirement if it vibrated along the floor rather than soared between the stars? Would

Senator John Glenn of Ohio, thus preventing further congressional attention to his case. *Id.* at 105-06.

81. *Newman*, 877 F.2d at 1577. A perpetual motion machine is a device that outputs more energy than it receives as input, thus violating the law of conservation of energy. Wikipedia, Perpetual Motion, http://en.wikipedia.org/wiki/Perpetual_motion (last visited Oct. 5, 2006).

82. *Newman*, 877 F.2d at 1578.

83. In its decision, the district court appointed a special master, who determined that the invention generated more energy than it consumed. *Id.* at 1577. Although the district court judge ruled the master’s report to be “clearly erroneous in that it apparently contradicts the first law of thermodynamics,” the Federal Circuit found that the failure of the device to pass the National Bureau of Standards tests rendered the question of violating physical laws moot. *Id.* at 1580.

84. *Id.* at 1580.

85. *Newman* postulated that his machine was somehow converting mass into energy. *Id.* at 1577; *see also infra* Part IV.B (discussing how the inventor of the Motionless Electromagnetic Generator device claims to harness the power of “zero point” energy, a type of free energy gleaned from the vacuum of space).

86. *See, e.g.*, *E.I. du Pont de Nemours & Co. v. Berkley & Co.*, 620 F.2d 1247, 1260 (8th Cir. 1980).

87. *Id.*

88. *Id.* at 1260 n.17.

89. U.S. Patent No. 6,960,975 (filed Mar. 14, 2005).

a table-top, free-energy machine be legally “useful” as a doorstop? Clearly, there is a limit to this line of reasoning. As the USPTO sagely notes, the requirement of specific and substantial utility “excludes ‘throw-away,’ ‘insubstantial,’ or ‘nonspecific’ utilities, such as the use of a complex invention as landfill.”⁹⁰

Finally, note that courts often discuss utility rejections in the context of the enablement requirement of section 112 of the Patent Act.⁹¹ The first paragraph of the statute requires that the patent application “shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains . . . to make and use the same.”⁹² This enablement requirement is closely related to the utility requirement of 35 U.S.C. section 101.⁹³ The logic follows that if an invention is useless, it would be impossible for the patent to teach a person skilled in the art how to use it.⁹⁴ The *U.S. Patent and Trademark Office Manual of Patent Examining Procedure* (MPEP), the voluminous “bible” of patent prosecution,⁹⁵ advises examiners that any utility rejection should always be accompanied by an enablement rejection on the same grounds.⁹⁶ Although some cases of pure utility rejection do exist,⁹⁷ current MPEP guidelines should make them exceedingly rare.⁹⁸

B. Procedural Law Regarding Rejection of Inoperable Inventions

In evaluating the credibility of a patent for utility purposes, the USPTO and the courts⁹⁹ apply the *Langer* test.¹⁰⁰ The *Langer* test

90. U.S. PATENT & TRADEMARK OFFICE, U.S. DEP’T OF COMMERCE, MANUAL OF PATENT EXAMINING PROCEDURE § 2107(II)(B)(1)(i) (8th ed. 2001)

91. See, e.g., *In re Brana*, 51 F.3d 1560, 1564 (Fed. Cir. 1995).

92. 35 U.S.C. § 112 (2000).

93. U.S. PATENT & TRADEMARK OFFICE, *supra* note 90, § 2107.01(IV).

94. See *In re Fouche*, 439 F.2d 1237, 1243 (C.C.P.A. 1971) (“[I]f such compositions are in fact useless, appellant’s specification cannot have taught how to use them.”); *In re Brana*, 51 F.3d at 1564 (“Obviously, if a claimed invention does not have utility, the specification cannot enable one to use it.”).

95. See *In re Fisher*, 421 F.3d 1365, 1372 (Fed. Cir. 2005) (“The MPEP and Guidelines ‘are not binding on this court, but may be given judicial notice to the extent they do not conflict with the statute.’”) (citation omitted).

96. U.S. PATENT & TRADEMARK OFFICE, *supra* note 90, § 2107.01(IV).

97. See, e.g., *In re Houghton*, 433 F.2d 820, 820 (C.C.P.A. 1970).

98. U.S. PATENT & TRADEMARK OFFICE, *supra* note 90, § 2107.02(II)(B).

99. Normally, an applicant appeals a patent rejection from an examiner to the Board of Patent Appeals and then to the Court of Appeals for the Federal Circuit (formerly the Court of Customs and Patent Appeals). Patent cases may be brought in other federal circuit courts, but will ultimately end up in the Court of Appeals for the Federal Circuit if appealed. 69 C.J.S. *Patents* § 184 (2006).

presumes that an asserted utility is valid “*unless* there is reason for one skilled in the art to question the objective truth of the statement of utility or its scope.”¹⁰¹ Thus, unless there is a very good reason to doubt the claimed assertion of operability, the mere statement of the applicant that the invention works is sufficient.¹⁰²

In every case, it is incumbent upon the USPTO to make a *prima facie* case for rejecting a patent for lack of utility.¹⁰³ Speculation or assertion by the examiner that the invention is inoperable is insufficient—the examiner must also provide evidentiary support for any assertions.¹⁰⁴ The nature and quantity of evidence required to make a *prima facie* case will depend both on the nature of the claim and on whether the claim conforms to known scientific principles.¹⁰⁵

A particularly interesting case illustrating the relationship between presumption of utility and scientific principles is *In re Chilowsky*.¹⁰⁶ In the early 1950s, Chilowsky attempted to patent a design for a nuclear reactor, which, from a modern perspective, consisted of a suicidally dangerous molten mixture of fissionable material, moderator material, and cadmium (for “control”).¹⁰⁷ At the time of filing, no commercial reactors had yet been built.¹⁰⁸ The examiner argued a lack of enablement on the grounds that the exact mixture of materials was not made known in the application.¹⁰⁹ The examiner also opined that the reactor could never be built.¹¹⁰ The Board of Appeals added the further criticism that the invention was “speculative.”¹¹¹ The Court of Customs and Patent Appeals, however, noting that the laws governing the process of fission were well-established by scientists,¹¹² took the

100. U.S. PATENT & TRADEMARK OFFICE, *supra* note 90, § 2107.02(III)(A); *In re Langer*, 503 F.2d 1380, 1391 (C.C.P.A. 1974); *In re Brana*, 51 F.3d at 1566 (“A specification disclosure . . . must be taken as in compliance with the enabling requirement . . . unless there is reason to doubt the objective truth of the statements contained therein . . .”).

101. *In re Langer*, 503 F.2d at 1391.

102. *In re Gazave*, 379 F.2d 973, 977 (C.C.P.A. 1967) (citing *In re Chilowsky*, 229 F.2d 457 (C.C.P.A. 1956)).

103. *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992).

104. *Id.*; *In re Gaubert*, 524 F.2d 1222, 1224-25 (C.C.P.A. 1975).

105. *In re Gazave*, 379 F.2d at 978.

106. 229 F.2d 457.

107. *Id.* at 459-60.

108. *Id.* at 461.

109. *Id.*

110. *Id.*

111. *Id.*

112. *Id.* at 462.

position that the invention was presumed to be operable under these circumstances.¹¹³

The court then proceeded to divide the world of inventions into three distinct classes.¹¹⁴ The first class included those inventions which functioned according to known scientific principles.¹¹⁵ In such cases, no further evidence was required to create a presumption of operability.¹¹⁶ The second class included those inventions that were in conflict with known scientific principles.¹¹⁷ These types of patent applications create a “presumption of inoperativeness . . . so strong that very clear evidence is required to overcome it.”¹¹⁸ The third class included those inventions contradicting scientific principles that cannot be tested at all.¹¹⁹ The court implied that, for inventions that fell into the third class, only a demonstration that the invention actually worked and an explanation of the principles of operation would suffice to overcome the presumption of inoperability.¹²⁰

Other pre-*Langer* cases seem to confirm the idea that incredible claims will, by their very nature, shift the burden of proof to the applicant to demonstrate those claims. In *Fregeau v. Mossinghoff*, a case regarding a magnet that allegedly improved the taste of wine,¹²¹ the patent applicant conceded that there was a prima facie case for inoperability simply because of the nature of the claims made by the inventor.¹²² The *In re Citron* court found that the incredible nature of the claim (a cure for cancer) automatically shifted the burden of persuasion to the applicant.¹²³ The *In re Marzocchi* court proposed that “there may be times when the well-known unpredictability of chemical reactions will alone be enough to create a reasonable doubt as to the accuracy of a particular broad statement.”¹²⁴

The best that can be said of the dicta of *Chilowsky*, in light of the modern *Langer* test, is that perhaps the USPTO has a lower threshold of evidence to meet in making a prima facie case for inoperability in

113. *Id.*

114. *See id.*

115. *Id.*

116. *Id.*

117. *Id.*

118. *Id.*

119. *Id.*

120. *Id.*

121. Proof that lack of patent protection is not a bar to marketing can be found at The Wine Clip, <http://www.thewineclip.com> (last visited Nov. 1, 2006) (marketing an unpatented version of the invention litigated in *Fregeau*).

122. 776 F.2d 1034, 1038 (Fed. Cir. 1985).

123. 325 F.2d 248, 253 (C.C.P.A. 1963).

124. 439 F.2d 220, 223 (C.C.P.A. 1971).

instances where the inventions can be shown to contradict known scientific principles.¹²⁵ It may also be that the dicta of *Chilowsky* are still good representations of the law, and that *In re Langer* never contemplated overruling a presumption of inoperativeness in the rare cases of pseudoscientific inventions. A unique example of just such an exception to the *In re Langer* rule is *Process Control Corp. v. HydReclaim Corp.*, where the Federal Circuit Court determined that a mixer was inoperable for violating the law of conservation of mass after strictly construing the meaning of the term “discharge rate.”¹²⁶ The court reduced the operation of the mixer to the mathematical equation $A = A + B$ where B is not equal to zero.¹²⁷ This mathematical relationship is clearly a logical impossibility.¹²⁸ Expressed in such stark, mathematical terms, no prima facie case for inoperability was necessary.¹²⁹ Unfortunately, the vast majority of inoperability decisions do not reduce so neatly to a simple mathematical equation.

In light of the presumption of utility¹³⁰ and the above discussion, an inoperability rejection based upon mere assertions that the invention violates scientific principles would not likely succeed on appeal. Moreover, courts are not eager to incorporate scientific principles into case law.¹³¹ Perhaps for these reasons the *Newman v. Quigg* court was reluctant to rule that a prima facie case for inoperability automatically resulted from a violation of the laws of thermodynamics.¹³² The USPTO takes the view that since “incredible utility” rejections are rarely upheld by federal courts,¹³³ all prima facie cases for rejection on utility grounds must be supported by factual evidence.¹³⁴

125. In a footnote to its restatement of the *Langer* test, the Federal Circuit Court appeared to incorporate the narrow exception of *In re Marzocchi*. See *In re Brana*, 51 F.3d 1560, 1566 n.17 (Fed. Cir. 1995) (“In the field of chemistry generally, there may be times when the well-known unpredictability of chemical reactions will alone be enough to create a reasonable doubt as to the accuracy of a particular broad statement put forward as enabling support for a claim. This will especially be the case where the statement is, on its face, contrary to generally accepted scientific principles.”) (quoting *In re Marzocchi*, 439 F.2d at 223).

126. 190 F.3d 1350, 1359 (Fed. Cir. 1999).

127. *Id.*

128. *Id.*

129. *See id.*

130. *See Structural Rubber Prod. Co. v. Park Rubber Co.*, 749 F.2d 707, 714 (Fed. Cir. 1984).

131. *Brooktree Corp. v. Advanced Micro Devices, Inc.*, 977 F.2d 1555, 1573 (Fed. Cir. 1992) (“The issues of utility and enablement involved consideration of complex scientific principles Scientific issues are not treated as legal abstractions”).

132. 877 F.2d 1575, 1580 (Fed. Cir. 1989).

133. U.S. PATENT & TRADEMARK OFFICE, *supra* note 90, § 2107.02(III)(B).

134. *Id.* § 2107.02(IV).

A prima facie case for inoperability is, of course, rebuttable by the applicant.¹³⁵ Once the prima facie case is made by the USPTO, the burden of persuasion shifts to the applicant.¹³⁶ The applicant must then “provide rebuttable evidence sufficient to convince . . . a person [of ordinary skill in the art] of the invention’s asserted utility.”¹³⁷

III. LAW-IN-ACTION ANALYSIS OF THE PATENTING PROCEDURE

A. *The USPTO Lacks Sufficient Institutional Expertise*

The actual work of examining a patent application at the USPTO occurs in one of eight different technology centers under the direction of the Deputy Commissioner for Patent Operations.¹³⁸ Each technology center devotes its efforts to examining patent applications in a particular field of specialization.¹³⁹ Thus, the USPTO increases the overall level of expertise by compartmentalizing expert examiners within a particular subfield.

A person applying to become a patent examiner must have an undergraduate degree related to the field in which the examiner wishes to practice and, at a minimum, twenty-four credit hours of course work in that field.¹⁴⁰ For example, to be an examiner in the field of physics, one must have studied at least twenty-four credit hours of undergraduate physics, including at least two of the following classes: electromagnetism, thermodynamics, optics, modern physics, and acoustics.¹⁴¹ Although this level of educational background is hopelessly inadequate for a thorough understanding of many of the complex patent applications seen in recent years,¹⁴² it is hardly fair to criticize the USPTO too harshly in this regard.

135. *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992).

136. *Id.*; *In re Brana*, 51 F.3d 1560, 1566 (Fed. Cir. 1995).

137. *In re Brana*, 51 F.3d at 1566 (citing *In re Bundy*, 642 F.2d 430, 433 (C.C.P.A. 1981)).

138. U.S. Patent & Trademark Office, Deputy Commissioner for Patent Operations, <http://www.uspto.gov/web/offices/pac/dacp/peg> (last visited Nov. 1, 2006).

139. *Id.*

140. U.S. Patent & Trademark Office, Patent Examiner Qualifications, <http://www.uspto.gov/web/offices/ac/ahrpa/ohr/jobs/qualifications.htm> (last visited Nov. 1, 2006).

141. *Id.* The USPTO website uses archaic language to describe these fields of study—that is, electricity and magnetism, heat, light mechanics, modern physics, and sound. *Id.*

142. *See, e.g., infra* Part IV.D.

For one thing, the problem of inadequate technological training may be less severe than it appears, since examiners are expected to increase their understanding of a chosen field after many years of exposure to patent applications.¹⁴³ More importantly, even if the USPTO recruited only doctoral graduates, which would certainly involve significant costs, the concern of inadequate training would likely persist. For example, the field of physics is so specialized that practitioners of one subfield will often find the scholarly articles of another subfield virtually unintelligible.¹⁴⁴ A solution to this problem is likely to involve not only more technological sophistication from examiners, but outside help as well.¹⁴⁵

B. Reexamination Makes Inoperability Rejections Difficult

If the USPTO is approving patents for inoperable inventions, then one possible solution is to have the USPTO reexamine allegedly inoperable patents after they are issued. The patent application process is an inherently *ex parte* procedure with no input besides that of the applicant and a presumably disinterested examiner.¹⁴⁶ Thus, neither interested investors with possible prior art claims nor consumers are allowed to state their objections until after the patent has been issued.¹⁴⁷

143. U.S. Patent & Trademark Office, Patent Examiner Training, http://www.uspto.gov/web/offices/com/annual/2005/0602_patexamtrain.html (last visited Nov. 1, 2006).

144. The premier academic journal in physics is *The Physical Review*, which is divided into ten separate publications: *Physical Review Letters* (selected articles from every subfield), *Physical Review A* (atomic, molecular and optical, physics), *Physical Review B* (condensed matter and materials physics), *Physical Review C* (nuclear physics), *Physical Review D* (particles, fields, gravitation, and cosmology), *Physical Review E* (statistical, nonlinear, and soft matter physics), *Physical Review Special Topics: Accelerators and Beams*, *Physical Review Special Topics: Physics Education Research*, *Physical Review Focus* (selected articles explained at a more elementary level), and *Review of Modern Physics* (survey articles about a particular topic). Am. Physical Soc’y, Physical Review Online Archive, <http://prola.aps.org> (last visited Nov. 1, 2006). As evidence of the mutual incomprehensibility of these journals, “researchers” are indicated as an intended audience of *Physical Review Focus*. Am. Physical Soc’y, About Focus, <http://focus.aps.org/about.html> (last visited Nov. 1, 2006).

145. See discussion *infra* Part V.B.

146. Russell E. Levine et al., *Ex Parte Patent Practice and the Rights of Third Parties*, 45 AM. U. L. REV. 1987, 1989 (1996).

147. The Domestic Publication of Foreign Filed Patent Applications Act of 1999 requires patent applications to be published eighteen months after the date of filing, even if the application process is not yet completed. Pub. L. No. 106-113, § 4502, 113 Stat. 1501A-561 (codified at 35 U.S.C. § 122(b)(I)(A) (2000)). The law was a response to the problem of submarine patents. See Mark A. Lemley & Kimberly A. Moore, *Ending Abuse of Patent Continuations*, 84 BUFF. L. REV. 63, 80 (2004). Even

This suggests that there should be some mechanism whereby a true adversarial proceeding can be conducted to determine whether a patent should have been issued at all.¹⁴⁸

Section 302 allows “[a]ny person at any time [to] file a request for reexamination by the Office of any claim of a patent on the basis of any prior art cited under the provisions of section 301 of this title.”¹⁴⁹ Could the reexamination process be used to mount an inoperability rejection? The limitations of such an approach are apparent. First, the reference to “prior art” (that is, the public knowledge available at the time of the invention)¹⁵⁰ suggests that subsequent studies conducted after a patent has been filed would be useless in determining inoperability. Second, only printed publications or other patents are allowed as evidence.¹⁵¹ This would obviously preclude expert testimony that an invention violates a particular scientific principle. Third, under 35 U.S.C. section 303, the Director of the U.S. Patent and Trademark Office¹⁵² has discretion to decide whether a reexamination will go forward,¹⁵³ and whether the reexamination process is the proper venue for an after-the-fact utility objection. Finally, the cost of filing a request for reexamination ranges from \$2,520 to \$8,800,¹⁵⁴ which may preclude concerned citizens from raising objections.

However, a patent can also be challenged for inoperability by bringing a case against the patent holder in federal court.¹⁵⁵ Unfortunately, the cost of prosecuting an action in federal court is at least as prohibitive as the cost of reexamination for interested third

so, there is no legal mechanism for a third party to challenge a patent during the application stage. Levine et al., *supra* note 147, at 1989.

148. See *infra* Part V.C for a discussion of possible postissuance solutions to the problem of inoperable patents.

149. 35 U.S.C. § 302. Section 301 of Title 35 refers to “writing prior art consisting of patents or printed publications which that person believes to have a bearing on the patentability of any claim of a particular patent.” 35 U.S.C. § 301.

150. BLACK’S LAW DICTIONARY 119 (8th ed. 2004).

151. 35 U.S.C. § 301.

152. This position was previously known as the Commissioner of Patents. See Intellectual Property and Communications Omnibus Reform Act of 1999, Pub. L. No. 106-113, § 4732(a), 113 Stat. 1501A-582 (1999).

153. 35 U.S.C. § 303(a) (“Within three months following the filing of a request for reexamination under the provisions of [35 U.S.C. section 302], the Director will determine whether a substantial new question of patentability affecting any claim of the patent concerned is raised by the request . . .”).

154. U.S. Patent & Trademark Office, FY 2006 Fee Schedule, <http://www.uspto.gov/web/offices/ac/qs/ope/fee2006may15.htm> (last visited Nov. 1, 2006).

155. See, e.g., *Process Control v. HydReclaim Corp.*, 190 F.3d 1350 (Fed. Cir. 1999) (involving a utility challenge brought before a federal court).

parties.¹⁵⁶ Moreover, a party with purely altruistic motives, such as a consumer protection group, may be prohibited from bringing such a suit for lack of standing.¹⁵⁷

IV. CASE STUDIES

In this Part, several patent applications will be examined in detail in order to point out flaws in the patenting system and explain why such patents were issued in the first place. The patents are described in order of increasing comprehensibility within the framework of accepted scientific principles. Part IV.A examines a virtually unintelligible patent issued for what amounts to a dowsing rod. Part IV.B examines a slightly more sophisticated patent granted to a free energy device (that is, a perpetual motion machine). Part IV.C discusses the cold fusion patent cases arising from a very sophisticated group of cold fusion scientists. Finally, Part IV.D examines a patent based on solid scientific principles whose claims were mistakenly assumed to be incredible by the examiner.

A. *The DKL LifeGuard Patents*

According to its maker's claims, the DKL LifeGuard, mentioned previously, is a device resembling a handgun¹⁵⁸ that allows the operator to home in on living human beings.¹⁵⁹ The LifeGuard is based on a series of patents¹⁶⁰ espousing a modified theory of dielectrophoresis called "dielectrokinesis."¹⁶¹ First of all, it should be noted that dielectrophoresis is an accepted scientific phenomenon whereby dielectric materials (for example, certain biological materials or plastics) are subjected to a small force when placed in a large,

156. Due to the complexities involved, patent litigation can cost millions of dollars. Matthew B. Lowrie, *Critical Issues in Managing Patent Litigation*, 44 IDEA 267, 270 (2004).

157. Standing to have a patent declared invalid requires "a reasonable apprehension on the part of the declaratory judgment plaintiff that it will face an infringement suit." *Medimmune, Inc. v. Genentech, Inc.*, 427 F.3d 958, 964 (Fed. Cir. 2005), cert. granted 74 U.S.L.W. 3471 (Feb. 21, 2006) (No. 05-608).

158. See U.S. Patent No. 5,748,088 fig.1 (filed Nov. 27, 1996).

159. *Id.* col.4.

160. See patents cited *supra* note 11.

161. '088 Patent. The word "dielectrokinesis," which appears only in the title of the patent, may be a portmanteau of the phrase "an electrokinetic effect due to dielectrophoresis." *Id.* cols.1-2.

nonuniform electric field.¹⁶² “Dielectrokinesis,” on the other hand, appears to be a term invented by the applicants to describe the decidedly nonscientific theory that a handheld device will respond to a hidden human entity many meters away.¹⁶³

In a report sponsored by the National Institute of Justice, Sandia National Laboratories disassembled a DKL LifeGuard Model 3 to determine whether the device was “designed on solid scientific principles.”¹⁶⁴ The investigators referred to the portion of the circuit designed to operate on the theory of dielectrokinesis and actually rotate the antenna as the “passive module.”¹⁶⁵ The report found that “[t]he passive detection module is an open circuit, and the most critical component of the passive detection module is composed of human hair glued between two small pieces of polystyrene.”¹⁶⁶ After an exhaustive analysis, the report enumerated eleven compelling scientific reasons explaining why the device should not work as claimed, including the fact that “[t]here is no accepted physical principle or theory that supports the idea that human hair can tune a dielectric material to respond only to human heart electrical signals.”¹⁶⁷ As a final note, the author quoted a recognized expert in dielectrophoresis¹⁶⁸ who stated that “if indeed the device’s operation is based on [dielectrophoresis] then [my] own twenty-five years of study of the subject have been for naught.”¹⁶⁹

Had this report been part of the record during the patent application process, the examiner would have likely been able to make a *prima facie* case of inoperability. According to the report, the device clearly claims to operate in contradiction to accepted scientific principles.¹⁷⁰ DKL would have had the option of rebutting the *prima facie* case by actually demonstrating that the device worked in a

162. Herbert Pohl coined the term in the 1960s. See HERBERT A. POHL, DIELECTROPHORESIS: THE BEHAVIOR OF NEUTRAL MATTER IN NONUNIFORM ELECTRIC FIELDS 5 (1978).

163. See '088 Patent.

164. DALE W. MURRAY, SANDIA NAT'L LABS., PHYSICAL EXAMINATION OF THE DKL LIFE GUARD MODEL 3, at 4 (1998), available at <http://www.nlectc.org/pdf/files/dklanalysis.pdf> (last visited Oct. 6, 2006).

165. *Id.*

166. *Id.*

167. *Id.* at 22-23.

168. See *supra* notes 163-64 and accompanying text for an explanation of the difference between dielectrophoresis and “dielectrokinesis.”

169. MURRAY, *supra* note 165, at 24.

170. *Id.* at 22-23.

controlled scientific test.¹⁷¹ Although now irrelevant for the patents already issued, such a test did indeed occur.¹⁷²

At the request of the Department of Energy, Sandia National Laboratories conducted a double-blind¹⁷³ study to see whether the DKL LifeGuard was capable of locating an unseen person more often than predicted by random chance.¹⁷⁴ Live human test subjects were placed in plastic crates, and the DKL representative was asked to locate them using the DKL LifeGuard device.¹⁷⁵ In the first phase of the test, which was not double-blind, the DKL representative was shown where the human subjects were hidden and correctly located each subject 100 percent of the time.¹⁷⁶ The purpose of this baseline test was to ensure that the test conditions were acceptable to the test subject (and to prevent the inevitable excuses in cases of subsequent failure).¹⁷⁷ In subsequent trials, the DKL representative was not aware of the location of the human subjects and performed in a manner very consistent with random chance.¹⁷⁸ The authors concluded that the “device performs no better than random chance.”¹⁷⁹

It is instructive to inquire whether a patent examiner could have determined the inoperability of the DKL device based on the information present in the patent application. All of the DKL patents make similar scientific claims,¹⁸⁰ thus this section will focus only on the claims of the first patent issued, entitled “Device and Method Using Dielectrokinesis to Locate Entities.”¹⁸¹ The application contains several complex drawings of the device,¹⁸² a detailed schematic of the electrical system using mostly standard electronic symbols,¹⁸³ and a description of

171. See, e.g., *Fregeau v. Mossinghoff*, 776 F.2d 1034, 1038-39 (Fed. Cir. 1985).

172. DALE W. MURRAY ET AL., SANDIA NAT'L LABS., DOUBLE-BLIND EVALUATION OF THE DKL LIFE GUARD MODEL 2 (1998), available at <http://www.prod.sandia.gov/cgi-bin/techlib/access-control.pl/1998/980977.pdf>.

173. A double-blind study is one in which neither the tester nor the person being tested knows the conditions of the test while it is being conducted. *Id.* at 5. This prevents the person being tested from gaining information about the test conditions from the tester. *Id.*

174. *Id.*

175. *Id.* at 6.

176. *Id.* at 7, 9.

177. *Id.* at 7.

178. *Id.* at 7-13.

179. *Id.* at 13.

180. See patents cited *supra* note 11.

181. U.S. Patent No. 5,748,088 (filed Nov. 27, 1996).

182. *Id.* figs.2-4, 6.

183. *Id.* fig.5.

the dielectrophoretic effect along with two irrelevant equations¹⁸⁴ governing the force on a spherical and cylindrical dielectric in a nonuniform electric field.¹⁸⁵ Figure 1 of the '088 Patent shows a man pointing the device at another man on the other side of a barrier.¹⁸⁶ There is even a table of dielectric constants for a number of materials which appears to have been copied from a physics textbook¹⁸⁷ and is utterly unrelated to the list of dielectric materials that make up the substance of the claims.¹⁸⁸ The best that can be said of the patent is that it is virtually incomprehensible. A patent examiner confronting this patent application for the first time would have faced the classic conundrum of deciding whether the patent was the result of genius or delusion.

There are, however, several clues that point toward the latter interpretation. For one thing, the physical construction of the device is reminiscent of a classic dowsing rod, in that the device is “held in a balanced horizontal state”¹⁸⁹ such that it pivots around the handle in response to very small movements of the operator’s hand. Such a device would respond very sensitively to the operator’s conscious or subconscious desires through the “ideomotor” effect.¹⁹⁰ Unfortunately, unlike the perpetual motion machine, the dowsing rod does not appear to elicit the same type of institutional skepticism from the USPTO.¹⁹¹

As far as scientific objections to the device that would amount to a *prima facie* case for inoperability, it must be recognized that the patent is so complex and incomprehensible that there would be very little point to objecting to the claims in detail. On the other hand, an examiner might have pointed out the absence of any theoretical justification as to why the device would be particularly prone to detecting humans, as opposed to mice or automobiles. Although there is no requirement to disclose a theory of operation as a condition of patentability, pointing out the lack of a credible theory in this case would have helped to

184. The equations are not referred to again in the rest of the patent. *See id.*

185. *Id.* cols.1-2.

186. *Id.* fig.1.

187. *Id.* col.3.

188. For example, of the list of fifteen dielectrics in claim 22 of the patent, only air, water, and barium titanate appear in the table. *See id.* cols.3, 10.

189. *Id.* abstract.

190. *See, e.g.,* Ray Hyman, *The Mischief-Making of Ideomotor Action, in SCIENCE MEETS ALTERNATIVE MEDICINE: WHAT THE EVIDENCE SAYS ABOUT UNCONVENTIONAL TREATMENTS* 95, 99, 113 (Wallace Sampson & Lewis Vaughn eds., 2000). The ideomotor effect is the psychological theory that the operator of a device, such as a Ouija Board or a dowsing rod, will subconsciously direct the device towards an intended goal. *Id.* at 113. This would also explain the perfect accuracy of the unblinded test in the Sandia Report. MURRAY, *supra* note 173, at 7, 9.

191. *See Newman v. Quigg*, 877 F.2d 1575, 1577 (Fed. Cir. 1989).

establish that the invention was “incredible in the light of the knowledge of the art.”¹⁹² In addition, the examiner could have argued that the relationship between the construction of the device and the accepted theory of dielectrophoresis was speculative at best.¹⁹³ According to standard procedure, the examiner would have had to assemble “factual findings” to support these conclusions.¹⁹⁴ From any perspective, the idea of documenting these objections with objective “proof” seems daunting at best.

Fortunately, there is a record of what actually occurred during the examination process for this patent.¹⁹⁵ The assistant examiner, who conducted the majority of the examination, had a few years of experience at the USPTO and a bachelor’s degree in electrical engineering.¹⁹⁶ The primary examiner claimed that he typically gave applications a “quick look” to make sure that the form of the application was acceptable.¹⁹⁷ In the secondary examiner’s own words: “I tried to look up ‘dielectrokinesis,’ but I couldn’t find it. I trusted them that it works as they claimed, and I assumed that people skilled in the art would use this word all the time.”¹⁹⁸

From the above discussion, it is apparent that the ‘088 Patent is incomprehensible, not because of the complexity of its subject matter, but because it describes a nonsensical invention. Had the secondary examiner recognized this distinction, she could have asserted that the patent application was deficient regarding utility and enablement.¹⁹⁹ However, as discussed before, the mere assertion that the application is incomprehensible is not enough—the examiner must also make a *prima facie* case to prove that assertion.²⁰⁰ Moreover, a patent examiner who lacks the expertise to be considered a “person skilled in the art”²⁰¹

192. *In re Citron*, 325 F.2d 248, 253 (C.C.P.A. 1963).

193. See MURRAY, *supra* note 165, at 22-24.

194. U.S. PATENT & TRADEMARK OFFICE, *supra* note 90, § 2107.02(IV).

195. Voss, *supra* note 18, at 1254.

196. *Id.*

197. *Id.*

198. *Id.*

199. For a discussion of the relationship between utility and enablement, see *supra* Part II.B.

200. Voss, *supra* note 18, at 1254.

201. To be fair, the *In re Langer* court gave no guidance in determining who is a “person skilled in the art” for purposes of utility rejections. 503 F.2d 1380, 1392 (C.C.P.A. 1974). However, “person skilled in the art” is a term of art that has received some clarification in the context of the novelty requirement. See 35 U.S.C. § 103(a) (2000) (indicating that an invention is not patentable if it is perceived to be an obvious improvement by a “person having ordinary skill in the art”); *Std. Oil Co. v. Am. Cyanamid Co.*, 774 F.2d 448, 454 (Fed. Cir. 1985) (stating that the person of ordinary skill in the art is a hypothetical person who is “presumed to have knowledge”

would be both legally and practically incapable of rejecting a patent on inoperability grounds. It is no wonder that the examiner chose to assume that she simply lacked enough skill to understand the invention.

B. The “Motionless Electromagnetic Generator”

In March 2002, a group of inventors received a patent for a device called the Motionless Electromagnetic Generator (MEG).²⁰² The device is an elaboration of the simple electrical transformers so ubiquitous in the modern world.²⁰³ The principle innovation is the addition of a permanent magnet and some extra coils of wire.²⁰⁴ In summarizing the invention, the inventors stated that “a first objective of the present invention [is] to provide a magnetic generator [in] which a need for an external power source during operation of the generator is eliminated.”²⁰⁵ The inventors went on to describe how, by feeding some of the output power back into the input, the device could be used to generate power with no external energy source or moving parts.²⁰⁶ The MEG is thus a classic example of a perpetual motion machine—that is, a machine that produces more energy than it consumes but contains no internal or external source of energy to drive its operation.²⁰⁷

Perpetual motion machines violate the first and second laws of thermodynamics, both well-established scientific principles.²⁰⁸ If the utility of a device were based on a claim to generate “free” energy as perpetual motion machines purport to do, then, by simple extension of the accepted laws of physics, the device would be inoperable and would therefore fail the utility test of 35 U.S.C. section 101.²⁰⁹ The dicta in

of the prior art in the field of the invention); *Envtl. Designs, Ltd. v. Union Oil Co.*, 713 F.2d 693, 696 (Fed. Cir. 1983) (holding that six factors were relevant to determining the level of ordinary skill in the art, including “sophistication of the technology” and the “educational level of active workers in the field”). See generally Joseph P. Meara, *Just Who Is the Person Having Ordinary Skill in the Art? Patent Law’s Mysterious Personage*, 77 WASH. L. REV. 267, 276 (2002). Thus, the “person skilled in the art” is a hypothetical person whose level of skill may not match the skill of the individual examiner. *Id.*

202. U.S. Patent No. 6,362,718 (filed Sept. 6, 2000).

203. *Id.* fig.2.

204. *Id.* figs.1, 2.

205. *Id.* col.4.

206. *Id.*

207. Wikipedia, *supra* note 81.

208. The first law of thermodynamics states that energy is conserved in a closed system, while the second law states that the entropy, or amount of disorder, in a closed system always increases with time. WALTER GREINER ET AL., THERMODYNAMICS AND STATISTICAL MECHANICS 33, 41 (Dirk Rischke trans., 1995) (1987).

209. 35 U.S.C. § 101 (2000); *In re Harwood*, 390 F.2d 985, 989 (C.C.P.A. 1968).

Newman v. Quigg support the unpatentability of perpetual motion machines, but the courts do not recognize the scientific arguments against such devices as a matter of law.²¹⁰

Unlike Newman, the drafters of the MEG patent were sensitive to the thermodynamic arguments against the operability of their device.²¹¹ In the detailed description sections, the inventors directly address the thermodynamical problem by pointing to the permanent magnet as the source of the excess energy.²¹² They also deny that the MEG is a perpetual motion machine, stating that “an electromagnetic generator operating in accordance with the present invention should be considered not as a perpetual motion machine, but rather as a system in which flux radiated from a permanent magnet is converted into electricity.”²¹³ According to this explanation, the permanent magnet operates as a “battery” that powers the device and saves it from violating the laws of thermodynamics.²¹⁴ Predictably, this highly dubious²¹⁵ explanation is mentioned only once in passing. Instead, the emphasis of the claims is on the generation of power without an external power source,²¹⁶ conjuring up images of a future world powered by cheap, limitless energy.

Such a vision is shared by at least one of the inventors, Tom Bearden. On his website, Bearden claims that the MEG operates “by extracting free energy from the vacuum.”²¹⁷ In fact, the website could best be described as a portal to a subculture of amateur and professional scientists who believe that traditional energy companies are turning a blind eye to the MEG and other devices that could revolutionize

210. See, e.g., 877 F.2d 1575, 1580 (Fed. Cir. 1989); see also *supra* Part II.A.

211. '718 Patent cols.10-11.

212. *Id.* col.11.

213. *Id.*

214. *Id.*

215. The second objective in the summary is “to provide a magnetic generator in which a magnetic flux path is changed without a need to overpower a magnetic field to change its direction.” '718 Patent col.4. Because the device simply diverts the direction of the magnetic flux from the permanent magnet, only a negligible amount of energy, if any, will be extracted from it. Further, if the device is a method of generating power from a permanent magnet, it seems counterintuitive to bury the description of this essential function in a single paragraph at column 11. Perhaps a better place to describe this function is in the title of the patent itself.

216. '718 Patent col.1.

217. The Tom Bearden Website, <http://www.cheniery.org> (last visited Nov. 1, 2006). Most scientists believe that extraction of energy from the vacuum violates the laws of thermodynamics for reasons that are beyond the scope of this commentary. See Wikipedia, Zero-Point Energy, http://en.wikipedia.org/wiki/Zero-point_energy (last visited Nov. 1, 2006).

worldwide energy production.²¹⁸ Visitors are informed that, with sufficient investment capital (\$11 million, although “\$12 million would be a bit easier budget”), a commercially viable power source could be developed from the MEG design.²¹⁹ Here we see the downside of the liberal patent approval system: the granting of a patent lends legitimacy to attempts to raise capital for investments that are unlikely to result in a commercially useful product. Although Bearden is unlikely to acquire millions of dollars in funding from sophisticated investors, the existence of the MEG patent may assist in the marketing of his books.²²⁰

The examiner approved the MEG patent within two years of filing.²²¹ Assuming that the device is inoperable,²²² what could the examiner have done to prevent this patent from being approved? First, the examiner could have attempted to show that the permanent magnet could not have been the power source given the details of the device’s construction or the nature of the claims.²²³ An expert’s report may have been sufficient in this case to satisfy the requirement of documentary evidence of inoperability and to shift the burden to the inventors.²²⁴ Second, the examiner could have asked the Director to request a working model for inspection under 35 U.S.C. section 114.²²⁵ This course of action is expensive and time consuming, but proved to be effective in preventing Newman from obtaining a patent in a similar situation.²²⁶ Because the patent was ultimately issued, the market will have to determine whether the device is operable or not. Unfortunately, the mere granting of a patent for the MEG transfers some level of undeserved legitimacy to the device which may have a negative effect

218. The Tom Bearden Website, Links to Related Information, <http://www.cheniery.org/links.htm> (last visited Nov. 1, 2006).

219. The Tom Bearden Website, MEG Funding, <http://www.cheniery.org/correspondence/011905.htm> (last visited Nov. 1, 2006).

220. These books include THOMAS E. BEARDEN, *ENERGY FROM THE VACUUM: CONCEPTS AND PRINCIPLES* (2002) and THOMAS BEARDEN, *OBLIVION: AMERICA AT THE BRINK* (2005).

221. See ’718 Patent.

222. In addition to the arguments against operability given above, any device that claims to be capable of generating vast amounts of energy at little or no cost should be met with a degree of skepticism for the following reasons: First, any such working device would attract a large amount of investment in an efficient marketplace and would rapidly result in a commercial product. Second, lack of peer-reviewed publication suggests a lack of peer-reviewable results (although many fringe scientific groups are known to publish among themselves in overly credulous journals).

223. See *supra* notes 165-70 and accompanying text.

224. See *supra* Part II.B.

225. 35 U.S.C. § 114 (2000) (“The Director may require the applicant to furnish a model of convenient size to exhibit advantageously the several parts of his invention.”); see also 37 C.F.R. § 1.91(b) (2006).

226. See *Newman v. Quigg*, 877 F.2d 1575, 1580-81 (Fed. Cir. 1989).

on an investor's ability to make informed decisions. In addition, the patent lends credibility to the unsupported notion that energy can be had for free by simply collecting it from empty space.

C. *The Cold Fusion Patents*

Cold fusion is a technology that briefly rose to international prominence in 1989 when two scientists, Professors Stanley Pons and Martin Fleischmann of the University of Utah, announced the possibility of generating energy through fusion using only a simple, table-top apparatus.²²⁷ Most scientists were (and still are) of the opinion that fusion could only be produced at enormous temperatures and pressures, requiring large, expensive facilities and a great deal of additional research.²²⁸ Since fusion produces a large amount of energy from a very small amount of fuel, the possibility of producing fusion cheaply and at low temperatures promised a revolution in energy production.²²⁹ Subsequent failure to reliably reproduce Pons and Fleischmann's results has left the scientific community generally skeptical of cold fusion.²³⁰ Nevertheless, a number of scientists continue to do research in this field, and some have attempted to patent their work.²³¹ No reliable energy source has resulted from these efforts.²³²

This section examines two cases arising from attempts to patent cold fusion technology, *In re Swartz*²³³ and *In re Dash*.²³⁴ In both cases, the Federal Circuit affirmed the patent examiner's determination that the cold fusion devices were unpatentable due to inoperability.²³⁵ At first glance, these cases appear to represent a triumph of the U.S. patent system in weeding out inoperable inventions. However, a finding of inoperability with regard to cold fusion may be the result of special circumstances. For one thing, the scientific community has come to a general consensus that cold fusion does not work,²³⁶ producing a vast

227. Lee Dye & Thomas H. Maugh II, *Excitement and Skepticism: Fusion Claim Sparks Rush to Duplicate Experiment*, L.A. TIMES, Mar. 25, 1989, at A1.

228. See, e.g., Toni Feder, *Cold Fusion Gets Chilly Encore*, PHYSICS TODAY, Jan. 2005, at 31, 31 ("Claims of cold fusion are no more convincing today than they were fifteen years ago.").

229. Dye & Maugh, *supra* note 228.

230. See Feder, *supra* note 229, at 31.

231. See, e.g., *In re Swartz*, 232 F.3d 862 (Fed. Cir. 2000); *In re Dash*, 118 F. App'x 488 (Fed. Cir. 2004).

232. See Feder, *supra* note 229, at 31.

233. 232 F.3d 862.

234. 118 F. App'x 488.

235. *In re Swartz*, 232 F.3d at 864; *In re Dash*, 118 F. App'x at 492.

236. Feder, *supra* note 229, at 31.

amount of data in support of this position in the process.²³⁷ Secondly, cold fusion received a large amount of publicity, resulting in a consensus by the general population that the technology does not work.²³⁸ This publicity may have resulted in an institutional skepticism at the USPTO towards cold fusion that made utility rejections of these applications much more likely.

In *In re Swartz*, the appeals court found that the examiner had satisfied his burden of overcoming the presumption of utility by citing numerous references to the irreproducibility of the cold fusion effect.²³⁹ The burden then shifted to Swartz to provide evidence to rebut the case made by the examiner.²⁴⁰ Interestingly, Swartz was able to produce what the courts described as “voluminous record material” in support of his invention.²⁴¹ This is not surprising given that the cold fusion community has its own journals (for example, *Cold Fusion Times*), its own colloquia, and in some countries (like Japan) significant external funding.²⁴² What reasons, then, did the appeals court give for choosing between two competing records on the question of utility? In the words of the court:

Mr. Swartz complains that the Board “ignored” evidence that he submitted and disregarded his arguments, and he invites this Court to examine voluminous record material that he urges supports his position on the issue of utility. Such conclusory allegations in an appeal brief are quite insufficient to establish that the Board’s decision on the issue of utility is not supported by substantial evidence²⁴³

Was the court asking Swartz not only to substantiate his own claim, but also to disprove the examiner’s claim? Perhaps the general consensus that cold fusion is an irreproducible effect swayed the court instead.

The court in *In re Dash* gave a somewhat more thoughtful response to Dash’s attempt to rebut the examiner’s prima facie case of

237. See GARRY MCCrackEN & PETER STOTT, *FUSION: THE ENERGY OF THE UNIVERSE* 90-91 (2005).

238. See GARY TAUBES, *BAD SCIENCE: THE SHORT LIFE AND WEIRD TIMES OF COLD FUSION* (1993). For a less critical account, see EUGENE F. MALLOVE, *FIRE FROM ICE: SEARCHING FOR THE TRUTH BEHIND THE COLD FUSION FUROR* (1991).

239. 232 F.3d at 864.

240. *Id.*

241. *Id.*

242. Briefings, *Cold Fusion Gets Warm Reception in Japan*, ASEE PRISM, Mar. 2002, available at <http://prism-magazine.org/mar02/briefings.cfm>.

243. 232 F.3d at 864.

inoperability.²⁴⁴ The court took issue with the presented evidence of the generation of excess heat and the melting of the electrode, using scientific rather than legal arguments.²⁴⁵ In response to other evidence presented by Dash, the court sided with the examiner, asserting that in every case “the examiner found at least one sound reason to disbelieve [Dash’s] evidence.”²⁴⁶ Thus there was “substantial evidence” to support the finding that Dash’s invention was inoperable.²⁴⁷ In other words, Dash simply failed to substantiate his claim.

These cases imply that, given a sufficiently large body of scientific evidence allowing the examiner to make a prima facie case for inoperability, the rejection may survive on appeal. Like perpetual motion, cold fusion appears to have joined the ranks of technologies subject to institutional skepticism at the USPTO. In other cases, the scientific principles involved may be too obscure, or the public record too thin, to convince a court that the examiner has made a case for inoperability.

D. The Puthoff Patent

After years of legal wrangling, the USPTO awarded Harold E. Puthoff a patent entitled “Communication Method and Apparatus with Signals Comprising Scalar and Vector Potentials Without Electromagnetic Fields” in 1998.²⁴⁸ The Board of Patent Appeals and Interferences heard the appeal of his final rejection in 1997 and ultimately reversed all rejections.²⁴⁹ The brief, unpublished opinion illustrates many of the difficulties examiners often encounter when confronted with extremely complex scientific concepts.

At first glance, the claims of the invention appear too fantastic to be believed. The inventor claims that the device is an “electric communication method and apparatus that does not rely on magnetic, electric, or electromagnetic fields but employs structures resembling those capable of generating magnetic and electric fields.”²⁵⁰ The patent application also claims “to provide a receiver that is shielded from electromagnetic, electric and magnetic signals, but which is capable of receiving signals.”²⁵¹ In short, the inventor claims that the device is

244. 118 F. App’x 488, 492 (Fed. Cir. 2004).

245. *Id.*

246. *Id.*

247. *Id.*

248. U.S. Patent No. 5,845,220 (filed Aug. 23, 1993).

249. *Ex parte* Puthoff, No. 95-375, 1997 WL 1883784 (Bd. Pat. App. & Interf. Dec. 8, 1997).

250. ’220 Patent col.4.

251. *Id.* col.5.

able to transmit information into an electromagnetically shielded enclosure without using electromagnetic fields.

Upon closer inspection, the invention does appear to rest on solid, albeit somewhat obscure, physics principles.²⁵² However, to properly understand how the device works, an examiner would have to study significantly more physics than the minimum twenty-four credit hours required to become a patent agent.²⁵³ The invention relies²⁵⁴ on Maxwell's equations (taught in advanced undergraduate electrodynamics),²⁵⁵ an understanding of the Aharonov-Bohm effect (taught in advanced undergraduate or graduate quantum theory),²⁵⁶ and the Josephson effect (taught in advanced undergraduate or graduate solid state physics).²⁵⁷ Failure to properly understand how these concepts relate to the invention might lead an examiner to suspect that pseudoscience, rather than science, was involved in its construction, particularly given the bizarre nature of the patent claims.

Excerpts from the examiner's correspondence with Puthoff appear in the record and give some insight into the misunderstandings involved.²⁵⁸ For example, in rejecting the patent for inoperability, the examiner expressed doubt as to the possibility of the invention accomplishing the following:

1. Creating vector and scalar fields in a region where there are no electromagnetic fields.
2. Creating a curl-free vector potential.
3. Detecting a vector field in the absence of electromagnetic fields.
4. Shielding the receiver from electromagnetic waves.²⁵⁹

In fact, all of the above can be accomplished using the device described in the patent operating under known laws of physics.²⁶⁰ The

252. *Ex parte Puthoff*, 1997 WL 1883784, at *2.

253. *See* U.S. Patent & Trademark Office, *supra* note 142.

254. *See* '220 Patent cols.1-2.

255. *See, e.g.*, DAVID J. GRIFFITHS, INTRODUCTION TO ELECTRODYNAMICS, at ix (3d ed. 1999).

256. RUBIN H. LANDAU, QUANTUM MECHANICS II: A SECOND COURSE IN QUANTUM THEORY 179-80 (2d ed. 1996).

257. ANTONIO BARONE & GIANFRANCO PATERNO, PHYSICS AND APPLICATIONS OF THE JOSEPHSON EFFECT, at viii (1982).

258. *Ex parte Puthoff*, 1997 WL 1883784, at *2.

259. *Id.* at *1.

260. *Id.* at *2. The patent also suggested that an actual working device was built and tested. U.S. Patent No. 5,845,220 col.8 (filed Aug. 23, 1993) ("In an actual experiment, it was found that the quasi-static conditions can be met easily for frequencies equal at least to 1.5 MHz.").

first two objections imply that the examiner was unaware of Aharonov's discovery that vector potentials can exist independently of electromagnetic fields and have real, measurable effects.²⁶¹ The third objection implies an ignorance of Josephson junctions, which can respond to vector potentials.²⁶² The fourth objection is puzzling in that most people are aware that receivers (for example, cell phones) can be shielded by surrounding them with conductive metal (for example, steel-framed buildings). Although the Board of Patent Appeals and Interferences appeared to partially rely on the explanations of the appellant, the decision principally relied on the fact that the examiner failed to make a *prima facie* case for inoperability or lack of enablement.²⁶³

When a patent examiner discovers that the claims of a patent application are unclear, and there is no suggestion that the application is poorly written, there are two likely explanations: the patent is nonsensical or its principle of operation is too complex to immediately understand.²⁶⁴ The lesson of the Puthoff patent is that in a world where both types of patents are more and more common, even a competent examiner may fail to distinguish innovation from pseudoscience.

V. POSSIBLE SOLUTIONS

Any solution to the problem of patenting inoperable inventions must take into account the possible economic costs of maintaining the status quo, and then balance those costs with the economic demands placed upon the USPTO by any proposed solution. The principle economic cost of granting patents to inoperable inventions is the increased possibility of consumer fraud due to the fact that a patent is

261. Landau, *supra* note 257, at 180.

262. J.B. KETTERSON & S.N. SONG, SUPERCONDUCTIVITY 61 (1999).

263. *Ex parte Puthoff*, 1997 WL 1883784, at *3. An extensive search of the relevant literature reveals that Puthoff is alone in studying the remarkable effect described in his patent. This suggests, perhaps, that the experts in the field may find it implausible. Unfortunately, a detailed theoretical deconstruction of Puthoff's experiments is well beyond the scope of this Comment.

264. Although an expert physicist and engineer, Puthoff is recognized in many circles because of his penchant for dabbling in unorthodox scientific endeavors. In addition to being a believer in harnessing zero-point energy for space travel, *see* Harold E. Puthoff et al., *Engineering the Zero-Point Field and Polarizable Vacuum for Interstellar Flight*, 55 J. BRITISH INTERPLANETARY SOC'Y 137 (2002), he also coauthored a positive article about controversial, self-proclaimed psychic Uri Geller in the prestigious journal *Nature*. Russell Targ & Harold Puthoff, *Information Transmission Under Conditions of Sensory Shielding*, 251 NATURE 602 (1974). It is possible that the examiner was aware of Puthoff's reputation and became more willing to treat the patent application as nonsensical rather than overly complex, but there is no evidence that this actually happened.

often viewed by investors and consumers as the imprimatur of the U.S. government.²⁶⁵ Although the USPTO is not in the business of policing fraud, if it can reduce the possibility of fraud with little increased cost, then it should do so.²⁶⁶

The case studies in this Comment suggest that the appeals process generally produces the correct result when patent lawyers and judges devote their full attention to the problem.²⁶⁷ Unfortunately, the USPTO did not reject most of the patents criticized in this Comment.²⁶⁸ In addition, there is anecdotal evidence that applicants find more success rewriting and resubmitting applications than in pursuing patent appeals.²⁶⁹ The USPTO appears to devote more resources to defending a rejection than to deciding to make a rejection in the first place.²⁷⁰ Certainly, if the same level of technological and legal expertise were devoted to every patent application as the USPTO devotes to the appeals process, inoperable patents would be reduced to a minimum. The cost of such a program would be prohibitive, of course, so the challenge is to find solutions that would place as little strain as possible on the USPTO's already overburdened resources.²⁷¹

A. *Suggested Changes in the Law of Utility*

Currently, case law forbids the issuance of patents to completely inoperable inventions.²⁷² Unfortunately, the burden is upon the examiner to mount a prima facie case of inoperability, even when the nature of the claims suggests that the invention operates on pseudoscientific principles.²⁷³ Examiners are naturally reluctant to devote the resources necessary to make a prima facie case, particularly when a typical examiner only devotes an average of less than twenty hours to each application.²⁷⁴ It would be unreasonable to expect, for

265. See MERGES & DUFFY, *supra* note 26, at 216.

266. *Id.*

267. See *supra* Parts IV.C-D.

268. See *supra* notes 20-24 and accompanying text.

269. See Voss, *supra* note 18, at 1252-53 (noting that a company managed to get a once-rejected cold fusion patent issued by carefully redrafting the patent to bypass nuclear science examiners in favor of electrochemical examiners).

270. Carl Shapiro, *Patent System Reform: Economic Analysis and Critique*, 19 BERKELEY TECH. L.J. 1017 (2004).

271. See Mandy Barbara Seuffert, Comment, *Soft-Science Examiners at the USPTO: A Non-Obvious Solution to Reduce Erroneous Patent Grants*, 10 MARQ. INTELL. PROP. L. REV. 111, 111 (2006) (noting that the workload of the USPTO has almost doubled since 1984).

272. *In re Harwood*, 390 F.2d 985, 989 (C.C.P.A. 1968).

273. See *In re Gaubert*, 524 F.2d 973, 977 (C.C.P.A. 1967).

274. Shapiro, *supra* note 271, at 1027.

example, an examiner to delve into the obscure literature of dielectrophoresis and then prove, by arduous calculation, that the effect is insufficient to move an antenna in response to a distant human presence. The law, as it currently stands, requires far too much of the typical patent examiner.

Before *In re Langer*, the burden automatically shifted to the applicant to prove the utility of an invention when the claims were deemed to be incredible in light of accepted scientific principles.²⁷⁵ The presumption of inoperability where incredible claims are made may still be good law, but the USPTO takes a very conservative position on this issue, suggesting to its examiners that a mere assertion of incredible claims will not be sufficient to survive an appeal.²⁷⁶ Reasserting the presumption of inoperability in such cases would go a long way towards emboldening patent examiners to point out pseudoscientific deficiencies in the patents they examine.

Moreover, the current law actually increases the cost of rejecting inoperable patents by requiring the examiner to devote a significant amount of time and effort to the rejection. Not only would automatically shifting the burden to the applicant in cases of pseudoscientific claims add no additional cost to the process, it would actually decrease the overall costs of the patent rejections for the USPTO.²⁷⁷ Assuming that inoperable inventions have no legitimate market value, shifting the costs of patent rejections to the applicant would have a minimal effect on the efficiency of technology markets.²⁷⁸ Of course, the current system of quickly processing all but the most outrageous patents with wide-eyed credulity already results in significant cost savings. Yet, the thesis of this Comment is that the USPTO could benefit from a healthy dose of skepticism—reducing the cost of inoperability rejections would only help to make this skepticism more palatable.

One possibility is to amend the law to require the applicant to prove, by a preponderance of the evidence, that an invention is operable in cases where the theory of operation violates accepted scientific principles. The objection, of course, is that many current scientific principles were once thought to violate “known” principles and that such a rule might prevent the patenting of some truly

275. See *In re Chilowsky*, 229 F.2d 457, 462 (C.C.P.A. 1956).

276. U.S. PATENT & TRADEMARK OFFICE, *supra* note 90, § 2107.2(III)(B).

277. Applicants may also be less likely to appeal after a rejection if the burden of proving operability is shifted to them.

278. This is not the case, of course, when patent examiners mistakenly classify operable patents as inoperable. See *supra* Part IV.D.

innovative ideas.²⁷⁹ However, the requirement that patents be evaluated by one “skilled in the art”²⁸⁰ is subject to the same criticism—a person skilled in the art does not hold back judgment simply because of the possibility that an inventor’s unscientific claims may be vindicated sometime in the future. The patent system need not shy away from passing judgment on patent applications using only accepted scientific principles. When new scientific principles are established, the patent system can easily adjust, as the history of patentable baldness cures makes clear.²⁸¹

A second possibility is to create a statute specifically forbidding the patenting of devices that operate on the principles of perpetual motion, free energy, dowsing, psychic energy, spiritual energy, or theories of operation of a similar nature. There are two obvious objections to this approach. First, some observers who believe in the physical reality of psychic energy, for example, may find this approach to be too narrow-minded. Second, applicants can often remove or hide the taint of pseudoscience by clever drafting.²⁸² On the other hand, specifically referring to pseudoscientific principles by statute would prevent this narrow class of inoperability rejections from intruding into patent applications from legitimate business enterprises. In addition, such a statute would go a long way towards distancing the USPTO from the impression that it is effectively advocating pseudoscientific beliefs.

B. Outsourcing the Examination of Difficult Patents

Scientific publication generally operates on a system of peer review,²⁸³ in which articles are submitted to anonymous referees who

279. For example, in 1835, Auguste Comte echoed the scientific principles of the day by famously stating that the composition and temperature of stars are inherently unknowable facts. Neil deGrasse Tyson, *Over the Rainbow*, NAT. HIST., Sept. 2001, at 30, 32-33. Comte said this prior to the discovery of spectroscopy, a method for studying the composition of stars, among other things. *Id.* at 33.

280. 35 U.S.C. § 112 (2000); *see also supra* notes 199, 202.

281. *See, e.g., In re Cortright*, 165 F.3d 1353, 1357 (Fed. Cir. 1999). There was a remarkable boom in the biotechnology industry as a result of *Diamond v. Chakrabarty*, 447 U.S. 303 (1980). *See* Robin Feldman, *Rethinking Rights in Biospace*, 79 S. CAL. L. REV. 1, 2 (2005) (“*Chakrabarty* helped pave the way for the explosion in the biotechnology industry.”). This lends some credence to the argument that denying patentability limits innovation insofar as lack of investment in biotechnology pre-*Chakrabarty* was related to the unavailability of patent protection. However, biotechnology is based on sound scientific principles, unlike the patents that are the subject of this Comment. To put it more bluntly, pseudoscientific innovation is an oxymoron.

282. *See, e.g., supra* Part IV.B.

283. *See, e.g.,* Edwin S. Flores Troy, *Publish and Perish: Patentability Aspects of Peer Review Misconduct*, 5 TEX. INTELL. PROP. L.J. 47, 50-55 (1996). Even Albert

are specialists in the relevant field and who then submit their opinions as to an article's merits.²⁸⁴ The referees are generally professors or researchers who review articles out of a sense of professional obligation and who generally receive no compensation for their efforts.²⁸⁵ Moreover, referees are often not only experts, but the premiere experts in their field.²⁸⁶ By contrast, the patent system pits applicants with significant time and resources against an examiner whose knowledge of the field may be broad but insufficiently deep.²⁸⁷

Although it would be impractical to populate the USPTO with experts in every field, it may be possible to incorporate a peer-review system into the examination process. A list of outside experts could be kept at the USPTO for use in outsourcing selected patent applications. For the limited reforms contemplated in this Comment, examiners would select only those applications for peer review which, in their judgment, would be candidates for an inoperability rejection.²⁸⁸ Examiners could then get an expert opinion as to whether or not a case for rejection is worth pursuing. In addition, the reviewer could assist the examiner by providing the expert testimony necessary to make a prima facie case for rejection.

One serious objection to this scheme would be that the outside reviewers are members of a group, including academics and researchers, who often apply for patents.²⁸⁹ An expert reviewing a confidential patent application may be tempted to misuse that privileged knowledge to gain an advantage in the race to patent a lucrative idea.²⁹⁰ However, similar temptations already exist for examiners and patent attorneys. There are laws currently in place that attempt to prevent such abuses of confidentiality.²⁹¹ For employees of the USPTO, 35 U.S.C.

Einstein had to suffer the occasional criticism of his peers. See Daniel Kennefick, *Einstein Versus the Physical Review*, PHYSICS TODAY, Sept. 2005, at 43, 43.

284. See, e.g., Physical Review Letters, Editorial Policies and Practices, <http://prl.aps.org/info/polprocl.html> (last visited Nov. 1, 2006).

285. Charles Jennings, *The True Purpose of Peer Review: What You Can't Measure, You Can't Manage: The Need for Quantitative Indicators in Peer Review*, NATURE, <http://www.nature.com/nature/peerreview/debate/nature05032.html>.

286. *Id.*

287. See *supra* Part III.A.

288. The pros and cons of using a peer-review system to address other needed reforms in the patent system are beyond the scope of this Comment.

289. For a discussion of the perceived incompatibility of the academic peer-review system and the patent system, see Troy, *supra* note 284, at 63-64.

290. See *id.* at 56-59 (describing a misappropriation that allegedly occurred as a result of the peer-review process).

291. The ABA MODEL RULES OF PROF'L CONDUCT (2003) already provide significant protection to clients of patent attorneys. There is, for example, a conflict of interest rule for current clients, *id.* R. 1.8(b), a conflict of interest rule for former

section 4 forbids submitting patent applications during the period of employment and for one year thereafter.²⁹² Similar obligations could be placed on experts who choose to participate in the peer-review system.

If a peer-review system were used only in cases involving suspected wholly inoperable inventions, the abovementioned dangers of misappropriation would be minimized. However, if one believes that an inoperable invention has no legitimate market value, reviewers would have no commercial interest in the invention itself. Furthermore, the same scientists who currently disparage the patent system for granting pseudoscientific patents may be happy to review these patents out of a sense of professional obligation, thus incurring very little cost for the patent system.

The USPTO is currently considering a peer-review system proposed by Professor Beth Noveck, founder of the Peer to Patent Project.²⁹³ This organization's Community Patent System would consist of two stages. In the first stage, the community at large would have a time-limited opportunity to assist the patent examiner in locating the most relevant prior art references for a given patent.²⁹⁴ In the second stage, a panel of experts would convene to review the patent for obviousness.²⁹⁵ IBM and, more recently, Microsoft have volunteered to participate in a pilot program.²⁹⁶ Although the primary concern of the program appears to be the rejection of patents that are obvious or lacking novelty, the expert panels convened under stage two of the "Community Patent System would likely increase the possibility of identifying and rejecting inoperable inventions as well.

C. Opening the Reexamination Procedure to Inoperability Objections

Due to the secrecy requirement of the application process, the public does not become aware of a patent application until eighteen

clients, *id.* R. 1.9(c)(1), and a rule of confidentiality for both present, *id.* R. 1.6(a), and former, *id.* R. 1.9(c)(2), clients that would directly apply to the above scenario.

292. 35 U.S.C. § 4 (2000).

293. See The Peer to Patent Project, Community Patent Review, <http://dotank.nyls.edu/communitypatent> (last visited Nov. 1, 2006); Beth Simone Noveck, "Peer to Patent": *Collective Intelligence and Intellectual Property Reform*, Mar. 2006, http://dotank.nyls.edu/communitypatent/P2Patent_Apr_2006.pdf; Eli Kintisch, *PTO Wants to Tap Experts to Help Patent Examiners*, 312 SCI. 982, 982 (2006).

294. Noveck, *supra* note 294, at 23-31.

295. *Id.* at 31-34.

296. Press Release, The Peer to Patent Project, Microsoft Signs On as a Lead Sponsor and Participant in the Community Patent Review Initiative (July 14, 2006), http://cairns.typepad.com/peertopatent/2006/07/microsoft_signs.html.

months after the filing date.²⁹⁷ Even then, several years may pass before the scientific community becomes aware of an obscure patent. For inoperable inventions that are fraudulently marketed, consumers may not be aware of the invention until after it reaches the market. Thus, it is imperative that a workable system be in place to reject a patent on inoperability grounds long after it has been issued.

In its present state, the law presents numerous hurdles to after-the-fact inoperability rejection of issued patents.²⁹⁸ The reexamination process does not appear to be designed with inoperability rejections in mind.²⁹⁹ One possibility is to amend the law to specifically allow for interested third parties to file a request for reexamination of a patent on the grounds of inoperability. It would also be advisable to allow all currently available information to be used in arguing for rejection, since evidence of inoperability may involve expert testimony and post-market studies of the invention itself. In the case of inoperability, when the essential question is whether the invention works as claimed, the rationale for limiting the inquiry only to prior art is minimal or absent altogether. The most convenient time to determine whether an invention actually works is after it has reached the market, at which point the public may study the invention itself rather than an abstract description of it.

Unlike the solutions mentioned above,³⁰⁰ eliminating inoperable patents after they have been issued will necessarily involve additional costs. Currently, much of the cost of reexamining a patent is borne by the interested party through hefty fees.³⁰¹ For concerned scientists or consumer groups, the fees are prohibitive, particularly since the benefit is to the population as a whole rather than just to the individual requesting the reexamination. It may be possible to allow the Director of the USPTO to initiate reexamination at the urging of the concerned public, but this would shift the costs of removing inoperable patents to the Office. Thus, it may be preferable to prevent the issuance of inoperable patents during the application process rather than waiting until the patent has been issued.

VI. CONCLUSION

The public perception is that patented inventions are superior to unpatented ones, perhaps due to a misconception that the USPTO is

297. 35 U.S.C. § 122(b)(1)(A).

298. *See supra* Part III.B.

299. *Id.*

300. *See discussion supra* Parts V.A-B.

301. U.S. Patent & Trademark Office, *supra* note 155.

diligent in protecting the public from inoperable inventions. As a result, both consumers and investors have suffered due to the granting of patent protection to clearly pseudoscientific, inoperable inventions. The problem can be linked both to the procedural hurdles imposed on the USPTO by current case law and to institutional problems with the patenting process that make inoperability rejections the exception rather than the rule. Fortunately, there are economically feasible solutions to the problems as they currently exist. By strengthening the current law of inoperability rejections, outsourcing expertise, and relaxing the requirements for reexamination, the USPTO can not only fix past problems with inoperable patents, but mitigate future problems as well.