EVOLUTION OF THE CONCEPT OF NON-OBVIOUSNESS OF THE NOVEL INVENTION: FROM A FLASH OF GENIUS TO THE TRILOGY

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I. INTRODUCTION

The Constitution gives Congress express authority "To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries."[1] Patent protection for inventors has thus been the cornerstone in encouraging the application of science and technology toward useful ends.[2] This constitutional provision has resulted in patents being issued in this country since 1790 and has evolved into the current Patent Statute of 1952, found in Title 35 of the United States Code.[3] Because patent law is governed exclusively by federal statute, there is no state patent law to consider.[4]

The legal existence of a patent spans periods of both prosecution (writing, filing, and obtaining patents) and litigation, in which the validity and viability of patents are tested.[5] Since patent rights are constitutionally provided, patent claims are litigated in district courts, the Court of Appeals for the Federal Circuit (and its

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1. U.S. CONST. art. I, § 8, cl. 8. In contrast, the implied power of Congress to enforce Federal trademark law finds its foundation in the Commerce Clause. *See* U.S. CONST. art. I, § 8, cl. 3.

2. *See* EDMUND W. KITCH & HARVEY S. PERLMAN, INTELLECTUAL PROPERTY AND UNFAIR COMPETITION, 801–04 (1998).

3. *See* Patent Act of 1952, ch. 950, 66 Stat. 792 (codified as amended at 35 U.S.C. §§ 1–376 (1994)); Patent Act of 1939, ch. 451, 53 Stat. 1212; Patent Act of 1870, ch. 230, 16 Stat. 198; Patent Act of 1839, ch. 88, 5 Stat. 353; Patent Act of 1836, ch. 357, 5 Stat. 117; Patent Act of 1793, ch. 11, 1 Stat. 318; Patent Act of 1790, ch. 7, 1 Stat. 109. *See also* IRVING KAYTON, PATENT PRACTICE 1.5 (6th ed. 1998).

4. This fact turns on the Supremacy Clause of the Constitution. *See* U.S. CONST. art. VI, § 2; Sears, Roebuck & Co. v. Stiffel Co., 376 U.S. 225, 230–31 (1964).

5. *See*, KAYTON *supra* note 3, at 1.5.

predecessor, the Court of Customs and Patent Appeals), and the Supreme Court.[6] In addition, when a question of priority of invention (i.e. who invented first) arises during patent prosecution, a determination of priority is made by the Board of Patent Appeals and Interferences of the U.S. Patent and Trademark Office, and these decisions are reviewable by the federal courts.[7]

This Note examines one aspect of patentability of an invention, namely that of "non-obviousness" as described in 35 U.S.C. § 103, and examines how the various interpretations of § 103 by the circuit courts (prior to 1982) and the Federal Circuit (after 1982) have evolved over time. Section 103 requires that the invention be "non-obvious" to a mythical person "having ordinary skill in the art"[8] and the implications of this ordinary skill requirement will briefly be considered. A complementary area of patent litigation, the doctrine of equivalents, is examined alongside non-obviousness to address the question of *how different* an invention must be from the prior art before patent protection will be granted and sustained. This Note then explores the intersection of the interrelated protections of statutory non-obviousness and the judicial construction of "equivalents." Following a brief overview of patents and patentability, this Note outlines the maturing case law in the area of non-obviousness, and concludes with current views of non-obviousness (and to some extent, equivalents) in the Federal Circuit and the Supreme Court.

II. OVERVIEW OF PATENTS AND PATENTABILITY

The federal government grants an inventor exclusive property rights in her invention in exchange for full disclosure of the invention to the public.[9] By this agreement, the inventor obtains the right to prevent others from making, using, or selling that invention for a limited period of time.[10] Government, and society generally, benefit from technological advancements that derive from the ability to study and learn from the innovations incorporated into the new invention. Patents are therefore extremely practical legal instruments by which an inventor, a venture capitalist, a corporation, or others may protect their investments of time and money necessary to produce a contribution to the "useful arts."[11] Because of the requirement that an invention be "useful" for patentability, society as a whole reaps the benefit of this form of property protection because the invention is

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6. *See id.* at 1.7. In 1982, the Court of Appeals for the Federal Circuit was created and subsumed patent appeals from two former appeals courts. Prior to 1982, the various circuit courts of appeal heard appeals from the district courts while the Court of Customs and Patent Appeals heard appeals from the Patent and Trademark Office Board of Patent Appeals and Interferences. *See* ARTHUR R. MILLER & MICHAEL H. DAVIS, INTELLECTUAL PROPERTY: PATENTS, TRADEMARKS, AND COPYRIGHT 121–23 (1990).

7. *See* KAYTON, *supra* note 3, at 1.7.

8. *See* 35 U.S.C.A. § 103 (1998).

9. *See id.* § 261. *See also* MILLER & DAVIS, *supra* note 6, at 10.

10. *See* 35 U.S.C.A. § 271. *See also* LEWIS C. LEE & J. SCOTT DAVIDSON, MANAGING INTELLECTUAL PROPERTY RIGHTS 11 (1993).

11. U.S. CONST. art. I, § 8, cl. 8.

created under a system that compensates that inventor only if society *can* derive a benefit from the invention.[12]

A. Types of Patents

There are three primary types of patents described in the Patent Act: utility, design, and plant.[13] A utility patent concerns the functional and useful aspects of technological innovations, such as the machines, processes, electrical circuits, chemical compounds and new methods of making and manufacturing these innovations.[14] (For the purposes of this Note, the term "patent" shall refer to the utility patent.) In contrast, the design patent protects the ornamental aspects of a useful article and not its functional aspects.[15] A plant patent is awarded for the discovery and asexual reproduction of a new variety of plant.[16]

The description of an invention in the patent document itself need not be in any particular format, but it must include a detailed description of the invention (the "specification"), a description of the drawings (if any), and one or more *claims*.[17] The patent claims are of singular importance, since they define the subject matter that is given patent protection and delineate the scope of the inventor's intellectual property.[18] As a result, the patent claims are subject to particular scrutiny in determining the non-obviousness of the invention.

B. Requirements for Patentability

The Patent Act prescribes several requirements for obtaining patent protection, including: subject matter,[19] novelty,[20] utility,[21] non-obviousness,[22] enablement,[23] and best mode.[24]

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12. *See* 35 U.S.C.A. § 101.
13. *See id.* §§ 100–173. Design patents and plant patents have significantly different requirements for patentability in terms of patentable subject matter and the nature of the patent application and prosecution itself. *See id.* §§ 161–164, 171–173. This Note is concerned only with "utility" patents described in the Patent Act, 35 U.S.C.A. §§ 100–105.
14. *See* LEE & DAVIDSON, *supra* note 10, at 11.
15. *See* 35 U.S.C.A. § 171.
16. *See id.* § 161.
17. *See id.* § 112.
18. *See id.*
19. *See id.* § 101.
20. *See id.* § 102.
21. *See id.* § 101.
22. *See id.* § 103.
23. *See id.* § 112.
24. *See id. See also* LEE & DAVIDSON, *supra* note 10, at 17.

1. Subject Matter

Section 101 of the Patent Act defines patentable subject matter as "any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof...."[25] The "new" (novelty) and "useful" (utility) requirements of § 101 are examined below. Examples of subject matter that are *not* patentable include laws of nature, physical phenomena, and abstract ideas.[26] However, using the statutory definition, the courts have found microorganisms produced from genetic engineering,[27] mathematical algorithms applied to statutory subject matter,[28] business methods incorporating algorithms that produce a useful and tangible result,[29] and genetically-altered animals[30] to be patentable subjects.

2. Novelty

Patentable subject matter must also be *novel* or new to receive patent protection as defined in § 102 of the patent statute. Rather than defining what is "novel," § 102 describes events or situations that dictate when patentability is precluded, thus defining when an invention is *not* new.[31] Such events include situations such as publication of the invention at some time before the patent application was filed,[32] or prior patenting or "anticipation" of the subject matter of the invention.[33]

3. Utility

Inventions that have no use or utility are not patentable.[34] Utility cannot be presumed; it must be clearly disclosed as an essential part of the patent specification.[35] Thus, a new process that results in a product of no utility is itself not utilitarian.[36] For example, a new method or process of synthesizing a previously unknown chemical compound is not patentable unless the chemical itself is shown to have its own utility; its similarity to other, useful compounds is an insufficient basis for the utility requirement.

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25. 35 U.S.C.A. § 101.

26. *See id. See also* Diamond v. Chakrabarty, 447 U.S. 303, 309 (1980); LEE & DAVIDSON, *supra* note 10, at 17–18.

27. *See Diamond*, 447 U.S. at 309.

28. *See In re* Abele, 684 F.2d 902, 906 (C.C.P.A. 1982).

29. *See* State Street Bank & Trust Co. v. Signature Financial Group, Inc., 149 F.3d 1368, 1373 (Fed. Cir. 1998).

30. *See Ex parte* Allen, 2 U.S.P.Q.2d 1425, 1426 (B.P.A.I. 1987).

31. *See* 35 U.S.C.A. § 102.

32. *See id.* § 102(b).

33. *See id.* § 102(d).

34. *See id.* § 101.

35. *See id.* § 112. *See also* MILLER & DAVIS, *supra* note 6, at 67.

36. *See* 35 U.S.C.A. § 101. *See also* MILLER & DAVIS, *supra* note 6, at 67.

4. Non-Obviousness

In addition to novelty and utility, § 103 of the patent statute prevents patenting an invention that is merely an obvious variation of known technology.[37] The obviousness of an invention is evaluated relative to "a person having ordinary skill in the art to which said subject matter pertains."[38] How the courts' (especially the Federal Circuit's) interpretations of non-obviousness have evolved over time are examined below.

5. Enablement and Best Mode

The detailed description or specification of a patent must be sufficiently clear and complete as to enable a person of ordinary skill in the art to make and use the invention.[39] A separate requirement of § 112 of the Patent Act dictates that the specification disclose the "best mode contemplated by the inventor of carrying out his invention."[40] Thus, enablement and best mode are technically two separate requirements. Note that the patent application must disclose only the best mode contemplated by the *inventor* at the time of the application, not a better mode contemplated by another person skilled in the art.[41]

III. THE NOVELTY REQUIREMENT FOR PATENTABILITY

A. Overview of 35 U.S.C. § 102

A highly litigated portion of the patent statute is the § 102 requirement that the invention for which patent protection is sought be "novel," despite the rather objective statutory criteria for novelty.[42] Novelty is defined with respect to prior art, as reflected in the following statutory language: "A person shall be entitled to a patent unless...."[43] Thus, novelty is an initial, threshold determination that must be performed before any inquiry into non-obviousness is made. The § 102 definitions of prior art depend upon comparing that purported prior art to the date of invention,[44] the filing date,[45] or other characteristics of the claimed

37. *See* 35 U.S.C.A. § 103.
38. *Id.* § 103(a).
39. *See id.* § 112.
40. *Id.*
41. *See id.*
42. *See* KAYTON, *supra* note 3, at 4.1. These criteria include such objective measures as the filing date of the patent application as well as the date the item sought to be patented was invented. *See* 35 U.S.C.A. § 102.
43. 35 U.S.C.A. § 102.
44. *See id.* § 102(a), (e), (g).
45. *See id.* § 102(b), (d).

invention, such as abandonment[46] or where the applicant "did not himself invent the subject matter sought to be patented."[47]

B. Bars to Patentability Relating to Date of Invention

In the United States, the inventor who is first to *invent* is rewarded with patent protection,[48] when conception of the invention is coupled with due diligence in reducing that invention to practice.[49] Thus, inventive acts include the conception of the idea, diligence in reducing the idea to practice, and actual reduction of the invention to practice.[50] The date of invention may be shown to be as early as the date of conception.[51] The importance of an inventive act's timeline is demonstrated by § 102's definition of prior art according to the date of invention that prevents patenting the claimed invention. For example, if there is public knowledge of the invention in the United States, the invention has been used by others in the United States, or if the invention has already been patented or described in a printed publication anywhere in the world, at any time before the applicant's date of invention, then the claimed invention is not patentable.[52] Similarly, if the prior art is described in a U.S. patent having an effective U.S. filing date before the applicant's date of invention, section 102(e) bars patenting the claimed invention.[53]

C. Bars to Patentability Relating to Filing Date

Section 102 also defines prior art by comparing that art to the applicant's filing date for the claimed invention.[54] For example, if there is public use of the invention in the United States, the invention has been on sale in the United States, or if the invention has been patented or described in a printed publication anywhere in the world more than one year before the applicant's U.S. filing date, then the claimed invention is not patentable.[55] Once the elements of novelty as defined under § 102 are met, the invention must still meet the criteria of non-obviousness as outlined below.[56]

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46. *See id.* § 102(c).
47. *Id.* § 102(f).
48. *See id.* § 102(g).
49. In contrast, the first to *file* obtains such protection in foreign countries. *See* LEE & DAVIDSON, *supra* note 10, at 144.
50. *See* 35 U.S.C.A. § 102(g). *See also* MILLER & DAVIS, *supra* note 6, at 59–65.
51. *See* 35 U.S.C.A. § 102(g). *See also* ROBERT P. MERGES ET AL., INTELLECTUAL PROPERTY IN THE NEW TECHNOLOGICAL AGE 187 (1997).
52. *See* 35 U.S.C.A. § 102(a).
53. *See id.* § 102(e).
54. *See id.* § 102.
55. *See id.* § 102(b).
56. *See id.* § 103.

IV. THE NON-OBVIOUSNESS REQUIREMENT FOR PATENTABILITY

A. Overview of 35 U.S.C. § 103

While novelty over prior art is somewhat readily determinable under § 102, the subjective notion of non-obvious subject matter led to a virtual nightmare in litigating the validity of patents and inconsistent decisions among the federal circuits.[57] The first sentence of 35 U.S.C. § 103 provides an introduction to non-obviousness as follows:

> A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.[58]

Even though an invention is "not identically disclosed or described as set forth in § 102," i.e. "novel" under § 102, novelty is only a threshold obstacle that must be surmounted before the non-obviousness inquiry is initiated.[59] Section 103 later emphasizes that "[p]atentability shall not be negatived by the manner in which the invention was made,"[60] thereby directly responding to judicially applied standards beyond those required by the statute.[61]

B. Relationship of Non-Obviousness to Novelty

It is clear under § 103 that non-obviousness must be considered only when the claimed invention is novel.[62] Terms such as "not identically disclosed"[63] and "did not 'literally infringe'"[64] have been used to describe novelty and invoke § 103 non-obviousness considerations.[65] For example, assume an inventor files a patent application claiming a microprocessor and disclosing it to be bright red in color. Because there is not a single reference or item of prior art showing a bright red microprocessor, the invention is indeed novel.[66] However since the physical and material design of this particular microprocessor has been known for some time, different colors are obvious features having no effect on the microprocessor's utilitarian design, thereby rendering the novel design

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57. *See generally* KAYTON, *supra* note 3, at 5.24–.25.
58. 35 U.S.C.A. § 103(a).
59 *See id.* § 103.
60. *Id.* § 103(c).
61. *See infra* Part V.
62. *See* 35 U.S.C.A. § 103(a).
63. *Id.*
64. Graver Tank & Mfg. Co. v. Linde Air Prods. Co., 339 U.S. 605, 613 (1950).
65. *See generally* Graham v. John Deere Co., 383 U.S. 1 (1966). *See also* KAYTON, *supra* note 3, at 5.2.
66. *See generally* KAYTON, *supra* note 3, at 5.2.

unpatentable. If however, the red color is found to somehow cause the microprocessor to operate faster than a standard non-red one, then the claimed red microprocessor is also a non-obvious invention and patentability is possible.[67]

As a general rule, the *absence* of a claimed element or limitation in an invention from the prior art reference eliminates the prior art's anticipation of the invention, rendering it patentable.[68] One unusual exception to this general rule developed from the Federal Circuit's *In re Kathawala*[69] opinion. *Kathawala* involved foreign and U.S. applications which disclosed new chemical compounds for inhibiting enzyme activity. However, the foreign patent which constituted § 102 prior art against the U.S. application claimed the *process or method* for making these new chemicals, while the analogous U.S. application claimed the useful *compounds* themselves.[70] Ordinarily, such distinct statutory classes of invention would allow the applicant to proceed with a showing of non-obviousness.[71] However, the *Kathawala* court affirmed the rejection of the applicant's U.S. composition of matter claim over the foreign process claim, on the basis of § 102(d) novelty (the foreign application issued before the U.S. application was filed), rather than § 103 non-obviousness, holding that the composition of matter and the method of making it are "aspects" of the same invention that was already patented from the foreign application.[72] Thus, these two inventions were judicially considered the same invention within the narrow context of § 102(d). However, as this case illustrates, no structural or functional difference between a claimed invention and the prior art may be ignored.

V. THE REQUIREMENT OF NON-OBVIOUSNESS IN CONTRAST TO INVENTION

A. Historical Perspectives of Non-Obviousness—The Old Standards Under Great Atlantic & Pacific Tea Co. *and* Cuno Engineering

The original requirement for non-obviousness is actually a judicial construction, first described in 1850 in *Hotchkiss v. Greenwood*, where the Supreme Court held that more than novelty was required to distinguish an invention over prior art.[73] The differences of interpretation of obviousness among the federal circuits and the Supreme Court have been striking. Until § 103 described its standard of non-obviousness in 1952, the numerous cases decided after *Hotchkiss* relied on the "degree" or "amount of the invention" criterion to

67. *See generally id.*

68. *See* 35 U.S.C.A. § 103. *See also* KAYTON, *supra* note 3, at 5.3; MILLER & DAVIS, *supra* note 6, at 112–14.

69. 9 F.3d 942 (Fed. Cir. 1993).

70. *See id.* at 944–45.

71. *See* 35 U.S.C.A. § 101. *See also* KAYTON, *supra* note 3, at 5.3.

72. *See In re Kathawala*, 9 F.3d at 945.

73. *See* Hotchkiss v. Greenwood, 52 U.S. (11 How.) 248, 265 (1850).

distinguish an invention over prior art.[74] Thus, while some cases attempted to develop objective indicia of non-obviousness, such as *Reiner v. I. Leon Co.*[75] and *Lyon v. Bausch & Lomb Optical Co.*,[76] most courts from 1850 until the 1952 statute held to the "level of invention" standard, even in the face of strong objective evidence of non-obviousness.[77] Many of these cases relied upon indicia such as mere substitution of materials, rendering automatic what was previously done manually, or rearrangement of parts, which were held to preclude patentability as they were thought in no way to constitute the bases of invention.[78] Such negative rules of patentability came to dominate the judicially applied standards and reached a pivotal point in the infamous 1950 case of *Great Atlantic & Pacific Tea Co. v. Supermarket Equipment Corp.*[79]

1. Discovery and Non-Obviousness in Contrast to Invention

In *Great Atlantic & Pacific Tea Co.*, the Supreme Court firmly fixed the notion of "invention," rather than mere discovery,[80] as being a reliable indicator of patentability when the appropriate novelty requirements are met.[81] The court summarized the "level of invention" standard of patentability in several ways. First, the most simple indicia of patentability arising from non-obviousness, such as meeting a long felt societal need or substantial commercial success—standards which might be rather objectively determined—were flatly rejected.[82] These, the Court reasoned, could not substitute for "invention" in establishing patentability.[83] Second, Justice Douglas' concurring opinion in *Great Atlantic & Pacific Tea Co.* stood for the proposition that patents should not be granted on "gadgets" that were "new," but rather only the true advances of the frontiers of science should be

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74. *Id.* at 256. *See also* KAYTON, *supra* note 3, at 5.5–5.7.

75. 285 F.2d 501, 503–04 (2d Cir. 1960).

76. 224 F.2d 530, 535–36 (2d Cir. 1955).

77. *See id. See also* KAYTON, *supra* note 3, at 5.7.

78. *See Hotchkiss*, 52 U.S. (11 How.) at 262. *See also* KAYTON, *supra* note 3, at 5.5–5.7.

79. 340 U.S. 147 (1950).

80. The Supreme Court had previously elaborated "invention" in *Lincoln Engineering Co. v. Stewart-Warner Corp.*, 303 U.S. 545 (1938), with similar negative rules of patentability.

> The mere aggregation of a number of old parts or elements which, in the aggregation, perform or produce no new or different function or operation than that theretofore performed or produced by them, is not patentable invention. And the improvement of one part of an old combination gives no right to claim that improvement in combination with other old parts which perform no new function in the combination.

Id. at 549–50 (footnotes omitted).

81. *See Great Atlantic & Pacific Tea Co.*, 340 U.S. at 150–51.

82. *See id.* at 152–53.

83. *See id.*

protected by patents.[84] Such "gadgets" seemed to include inventions that, however useful, novel, and non-obvious, were technologically simple or even mundane. Third, the highly subjective standard of "invention" rather than "non-obviousness" was embraced by the court in combination patents,[85] in what appears to be a serious miscalculation of how science and technology give rise to novel inventions. The *Great Atlantic & Pacific Tea Co.* Court suggested that "Courts should scrutinize combination patent claims with a care proportioned to the difficulty and improbability of finding *invention* in an assembly of old elements."[86]

Judge Learned Hand of the Second Circuit appreciated this miscalculation the Court had made in *Great Atlantic & Pacific Tea Co.* when he took issue with the concept of "invention" in combination patents. Judge Hand observed that "[i]t is idle to say that combinations of old elements cannot be inventions; substantially every invention is for such a 'combination': that is to say, it consists of former elements in a new assemblage."[87] Indeed, as early as 1955 Judge Hand provided a clearly reasoned explanation of non-obviousness that presaged the "secondary indicia" redefined by the Supreme Court more than a decade later, when he stated:

> The most competent workers in the field had at least ten years been seeking [this invention]; there had been a number of attempts, none satisfactory; meanwhile nothing in the implementary arts had been lacking to put the advance into operation; when it appeared, it supplanted the existing practice and occupied substantially the whole field. We do not see how any combination of evidence could more completely demonstrate that, simple as it was, the change had not been "obvious...to a person having ordinary skill in the art.[88]

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84. *See id.* at 154–55 (Douglas, J., concurring). This proposition was embraced by the lower courts until the Supreme Court finally held in *Graham v. John Deere Co.*, 383 U.S. 1 (1966), that the "useful arts" that are constitutionally protected, *see* U.S. CONST., art. I, § 8, included the "gadgets" that Justice Douglas described in that concurring opinion. *See Great Atlantic & Pacific Tea Co.*, 340 U.S. at 155 (Douglas, J., concurring).

85. *See Great Atlantic & Pacific Tea Co.*, 340 U.S. at 148.

86. *Great Atlantic & Pacific Tea Co.*, 340 U.S. at 152 (emphasis added). A combination patent is one in which old elements are combined to produce a new result. *See* MILLER & DAVIS, *supra* note 6, at 124. Thus, it is only the *combination* of elements that constitutes the patentable subject matter. *See generally Great Atlantic & Pacific Tea Co.*, 340 U.S. at 147–58. Considerable controversy has surrounded the question of whether a synergistic result is *required* for the combination to be patentable. *See, e.g.*, Sakraida v. Ag Pro, Inc., 425 U.S. 273 (1976); Palmer v. Orthokinetics, Inc., 611 F.2d 316, 323–25 (9th Cir. 1980).

87. Reiner v. I. Leon Co., 285 F.2d 501, 503 (2d Cir. 1960).

88. Lyon v. Bausch & Lomb Optical Co., 224 F.2d 530, 535 (2d Cir. 1955) (citation omitted).

2. Flash of Genius Test for Patentability

Another standard of patentability that developed and paralleled the "invention" standard was the judicial rule known as the "flash of genius" test, formalized in *Cuno Engineering Corp. v. Automatic Devices Corp.*[89] Such a test was probably an appealing and relatively easy standard for unsophisticated jurors and judges to apply who had little appreciation for the process of scientific and technological advances.[90] The criterion of a flash of creative genius is an attractive notion, especially when contrasted alongside the view of invention by a series of small steps, minor accomplishments, and above all, tenacious effort. However, some of society's most beneficial advancements, such as the development of modern pharmaceuticals, often require many years of painstaking research and development.[91]

The flash of genius test was eventually rejected by the 1952 statute's § 103 standard of non-obviousness: "Patentability shall not be negatived by the manner in which the invention was made."[92] Years later, the Federal Circuit stated in *Ryko Manufacturing v. Nu-Star, Inc.* that this portion of § 103 was enacted expressly to overrule *Cuno*:[93]

> Only rarely now does a case turn on whether the "inventive act" took place instantaneously or over a long period of time. Indeed, the subjective condition of the inventor's mind at the time of the nonobvious development has been uniformly held by the Federal Circuit to be irrelevant to the question of patentability.[94]

The Federal Circuit went on to stress in *Ryko Manufacturing* that courts must determine what would have been objectively obvious to one of ordinary skill in the art at the time of the invention, rather than trying to ascertain what was subjectively obvious to the inventor.[95] While the flash of genius test survived far longer than it should have, the Federal Circuit's opinions and the explicit language of § 103 ultimately eliminated the flash of creative genius as a standard by which to judge patentability.

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89. 314 U.S. 84, 91 (1941).

90. Justice Frankfurter noted in a dissenting opinion several years after the *Cuno* decision that the training of Anglo-American judges ill suits them to try or review patent cases. *See* Marconi Wireless Tel. Co. v. United States, 320 U.S. 1, 60–61 (1943) (Frankfurter, J., dissenting).

91. *See generally* CHARLES N. SATTERFIELD, HETEROGENEOUS CATALYSIS IN INDUSTRIAL PRACTICE (2d ed. 1991).

92. Patent Act, 35 U.S.C.A. § 103 (1998).

93. 950 F.2d 714, 718 (Fed. Cir. 1991).

94. *See id.* (citing Kloster Speedsteel AV v. Crucible Inc., 793 F.2d 1565, 1574 (Fed. Cir. 1986)).

95. *See id.*

B. Evolution of Non-Obviousness Under the Trilogy: New Indicia

In 1966, the Supreme Court provided a clear admonition that *Great Atlantic & Pacific Tea Co.*'s subjective abstraction of "invention" could no longer be supported, when Justice Clark handed down the patent "Trilogy" comprised of *Graham v. John Deere Co.*,[96] *Calmar, Inc. v. Cook Chemical Co.* and *Colgate-Palmolive Co. v. Cook Chemical Co.*[97] which had been consolidated on appeal, and *U.S. v. Adams*.[98] For the first time since the patent statute was enacted in 1952, the Supreme Court provided clear guidelines for the elusive concept of non-obviousness when § 103 was construed in *Graham*. In all three cases, the fundamental question consisted of whether the § 103 non-obviousness standard was met,[99] thereby validating the patent, and the Court's emphasis in all three cases was on non-obviousness *over* invention.[100]

1. Graham v. John Deere Co.

The patented invention in *Graham* was a plow design that helped prevent damage to the shaft as it broke through rocky soil.[101] The plow shaft was attached to a hinge plate. The issue in this case was the location of attachment: was placing the shaft *below* this plate where it had more flex an obvious change from the original shaft attachment *above* the plate?[102] The now-conventional analysis for a determination of § 103 obviousness was first set forth in *Graham* and included the following elements. First, a determination of the scope and content of the prior art must be made by the court.[103] Second, the differences between the claims in issue and the prior art must be delineated.[104] Third, the measure of "ordinary skill in the art" with respect to the obviousness of the claims in issue (as derived from the first two prongs) should be established.[105] In applying this test to the new plow design the Court found that reversing the position of the plow shaft was obvious.[106]

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96. 383 U.S. 1 (1966).

97. 383 U.S. 1 (1966). *Calmar, Inc. v. Cook Chemical Co.* and *Colgate-Palmolive Co. v. Cook Chemical Co.* were consolidated and then decided with the *Graham* opinion. *See id.* at 3–5.

98. 383 U.S. 39 (1966).

99. *See Graham*, 383 U.S. at 17; *Adams*, 383 U.S. at 51–52.

100. *See Graham*, 383 U.S. at 14; *Adams*, 383 U.S. at 48–52.

101. *See Graham*, 383 U.S. at 19–21.

102. *See id.*

103. *See id.* at 17.

104. *See id.*

105. *See id.* at 17–18. Many of the patent validity issues require courts to examine and interpret the knowledge and intellectual prowess of a person of "ordinary skill in the art" as stated in § 103 of the Patent Act. *See* Patent Act 35 U.S.C.A. § 103(a) (1998). *See, e.g.*, Amgen, Inc. v. Chugai Pharm., 927 F.2d 1200, 1213 (Fed. Cir. 1991) (enablement); Texas Instruments v. USITC, 871 F.2d 1054, 1061–63 (Fed. Cir. 1989) (best mode and description and definiteness); *In re* Wands, 858 F.2d 731, 737 (Fed. Cir. 1988) (undue

Most importantly however, the Court went on to delineate the *final indicia of non-obviousness*: after an analysis of each of the above considerations, a series of what the court describes as "secondary considerations" must be examined.[107] The *Graham* court included the following inquiries as secondary considerations: the degree of commercial success of the invention that could be causally related to the invention itself, a long-felt but unsatisfied need for the invention, and the failure of others skilled in the art to fulfill that need.[108] These market responses have been linked to the so-called "economic doctrine of equivalents."[109] These secondary considerations of *Graham* came to incorporate the most significant elements of a determination of non-obviousness at the time.[110] The Federal Circuit has held that *Graham*'s secondary considerations constitute a fourth step in the standard of non-obviousness.[111] Indeed, the intersection between the doctrine of equivalents and non-obviousness is significant, both from procedural and substantive points of view,[112] and will be examined briefly below.

2. Calmar, Inc. & Colgate-Palmolive Co. v. Cook Chemical Co.

In the *Calmar* case, the Supreme Court invalidated a patent that covered a closure mechanism for leak-proofing a sprayer bottle.[113] The decision cast some uncertainty on the *Graham* indicia of non-obviousness, since by the *Graham* criteria, a strong argument of non-obviousness could be made in *Calmar*. The Supreme Court compared the claims in the closure mechanism patent to the prior art and found that the mechanism would have been obvious to one skilled in the art.[114] This finding was made in the face of the commercial success of the closure mechanism[115] and its having resolved a long-felt need in this industry.[116]

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experimentation); United States v. Telectronics 857 F.2d 778, 786 (Fed. Cir. 1988) (definiteness).

106. *See Graham*, 383 U.S. at 24–26.

107. *Id.* at 17–18. The secondary considerations of *Graham*, are secondary only in a chronological sense, not in evidentiary importance. *See* KAYTON, *supra* note 3, at 5.12.

108. *See Graham*, 383 U.S. at 17–18.

109. Timothy J. Douros, *Lending the Federal Circuit a Hand: An Economic Interpretation of the Doctrine of Equivalents*, 10 HIGH TECH. L.J. 321, 345–48 (1995).

110. *See* KAYTON, *supra* note 3, at 5.9.

111. *See* Vandenberg v. Dairy Equip. Co., 740 F.2d 1560, 1566–68 (Fed. Cir. 1984).

112. *See generally* Gregory B. Sephton, *Biotechnology: The Doctrine of Equivalents and Infringement of Patented Proteins*, 25 SUFFOLK U. L. REV. 1035 (1991) (examining this intersection with respect to biotechnology patents).

113. *See Graham*, 383 U.S. at 4.

114. *See id.* at 32–37.

115. *See id.* at 35–36.

116. *See id.* The argument has been made that, had the Supreme Court actually followed the *Graham* rules in *Calmar* and indeed, in *Graham* itself, the Court would have validated both patents. *See* KAYTON, *supra* note 3, at 5.18–19.

3. United States v. Adams

Adams is a particularly useful chemical technology case where the claimed invention, a battery, was perhaps as close to a prior art battery as possible without direct infringement.[117] The *Adams* battery used a novel combination of electrodes (cuprous chloride and magnesium) that, according to the government, was anticipated by prior art teaching the equivalence of cuprous chloride and silver chloride electrodes, and the equivalence of magnesium electrodes and zinc electrodes.[118]

The Supreme Court firmly rejected the government's argument that an invention so chemically similar to the prior art *must be obvious*, and therefore only physical or structural differences could be examined as a basis for non-obviousness.[119] Were these "merely equivalent substitutions," the Court stated, "it would follow that the resulting device—Adams'—would have equivalent operating characteristics."[120] This was clearly not the case. In fact, the performance of the *Adams* battery was so unexpectedly good and so far superior to existing batteries that it took a considerable amount of time for those skilled in the art to actually believe that it performed as it did.[121] Thus, the longstanding beliefs in the field actually *prevented* research into the specific combination that Adams hit upon.

The *Adams* Court pointed to several factors taken into account in reaching its decision. First, the current state of knowledge in the field actually *"taught away"* from the combination that Adams used in his invention.[122] Thus, the accepted standards that discouraged investigation in the area that Adams explored were specifically commented on when the Court stated that "known disadvantages in old devices which would naturally discourage the search for new inventions may be taken into account in determining obviousness."[123] Second, the Adams battery was a tremendous commercial success and was quickly adopted for military and scientific applications that were previously impossible, due to lack of an appropriate power source.[124] Finally, the differences between a claimed infringing device and the patented article must be examined in the context of all the evidence, including any *operational aspects* of the inventions.[125] In retrospect, this factor would allow a finding of non-obviousness for small changes which, in some technologies, would substantially improve the invention, while narrowly

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117. *See* United States v. Adams, 383 U.S. 39, 42–43 (1966).

118. *See id.* at 48.

119. *See id.* at 48–52.

120. *Id.* at 51.

121. *See id.* at 44. This fact was considered significant by the Court. *See id.* at 51–52. *See also* KAYTON, *supra* note 3, at 5.11.

122. *See Adams*, 383 U.S. at 52.

123. *Id.*

124. *See id.* at 44.

125. *See id.* at 42–48.

construing non-obviousness for an invention with large structural or physical changes that only provide a more complicated way to the same result.[126] The significance of this factor cannot be overstated.

C. Conflicting Views: Development of the Anderson's-Black Rock *Case*

Only three years after the Trilogy decisions by the Supreme Court, considerable confusion on non-obviousness ensued with the Supreme Court's decision in *Anderson's-Black Rock, Inc. v. Pavement Salvage Co.*[127] This case involved a combination patent apparatus that was used to lay a continuous strip of black-top pavement.[128] The Court held the patent to this apparatus invalid because it failed to meet the test of "invention," as "[e]ach of the elements combined in the patent was known in the prior art."[129] The Court went on to explain that "[t]he combination of putting the burner together with the other elements in one machine, though perhaps a matter of great convenience, did not produce a 'new or different function....'"[130] This "new or different function" conclusion was further elaborated:

> We conclude that while the combination of old elements performed a useful function, it added nothing to the nature and quality of the radiant-heat burner already patented. We conclude further that to those skilled in the art the use of the old elements in combination was not an invention by the obvious-nonobvious standard.[131]

In what can only be described as an explicit return to the "invention" test of *Great Atlantic & Pacific Tea Co.*, with only minor deference to the secondary indicia of the Trilogy, the Court further explained:

> A combination of elements may result in an effect greater than the sum of the several effects taken separately. No such synergistic result is argued here. It is, however, fervently argued that the combination filled a long felt want and has enjoyed commercial success. But those matters 'without invention will not make patentability.'[132]

This result seemed to raise more questions than it answered. When a combination patent is involved, what happens to the Trilogy's non-obviousness standard? Is this "invention" test to be used along with the Trilogy's secondary considerations when dealing with combination patents?

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126. *See generally* KAYTON, *supra* note 3, at 5.11.
127. 396 U.S. 57 (1969).
128. *See id.* at 57–59.
129. *See id.* at 59.
130. *Id.* at 60 (citation omitted).
131. *Id.* at 62–63 (footnote omitted).
132. *Id.* at 61 (quoting Great Atlantic & Pacific Tea Co. v. Supermarket Equip. Corp., 340 U.S. 147, 153 (1950)).

Professor Kayton, in an attempt to outline an appropriate inquiry for the practitioner in applying *Anderson's-Black Rock* alongside the Court's test in the Trilogy, put forth several suggestions.[133] First, a determination whether the claimed invention comprises a combination of "old" or already known elements must be made.[134] If it does, then one must determine if the combination produces a new or different *function* rather than just a new or different result.[135] Finally, just *how* new, unexpected, or different a combination of old, known elements must be to attain patentability must then be determined.[136] However, as further described by Professor Kayton, the problem with such a scenario is that any and every invention involves *some* combination of old elements, or in the case of a process patent, some combination of old steps.[137]

The effect the *Anderson's-Black Rock* formulation of the old *Great Atlantic & Pacific Tea Co.* "invention test" has on the Trilogy's secondary indicia seems to be as follows: secondary considerations are in fact "primary evidence"[138] of what the level of ordinary skill in the art is; thus non-obviousness must be determined with a view toward these secondary considerations. However, "those matters, 'without invention will not make patentability.'"[139] Thus, *Anderson's-Black Rock* in effect reintroduced the concept that an unanticipated result, taught away from by experts in the art, does *not* provide for patentability unless the invention functions in a different way.[140]

D. Further Conflicting Views: Sakraida v. Ag Pro, Inc.

The Supreme Court had an opportunity to clarify the obviousness question *vis-á-vis* "invention" when it reviewed the Fifth Circuit's decision in *Sakraida v. Ag Pro, Inc.*[141] This patent infringement case involved the obviousness of an automated water flush system to remove cow manure from the floor of a dairy barn.[142] The Western District of Texas embraced the old *Great Atlantic & Pacific Tea Co.* standard, via *Anderson's-Black Rock*, requiring "invention" and held the invention invalid.[143] However, the Fifth Circuit reversed the district court and held the patent valid by specifically examining the secondary considerations of *Graham.*[144] The Supreme Court reversed the Fifth Circuit and affirmed the

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133. *See* KAYTON, *supra* note 3, at 5.13–.14.
134. *See id.*
135. *See Anderson's-Black Rock*, 396 U.S. at 60.
136. *See* KAYTON, *supra* note 3, at 5.13–.14.
137. *See id.* at 5.14.
138. *See id.* at 5.15.
139. *Anderson's-Black Rock*, 396 U.S. at 61 (quoting Great Atlantic & Pacific Tea Co. v. Supermarket Equip. Corp., 340 U.S. 147, 153 (1950)).
140. *See* KAYTON, *supra* note 3, at 5.15.
141. 425 U.S. 273 (1976).
142. *See id.* at 273–74.
143. *See id.* at 274.
144. *See id.* at 280.

district court's finding.[145] Despite the Fifth Circuit's finding of a "synergistic result," the Supreme Court held that old elements in combination do not constitute a patentable result without invention.[146] Thus, the specific finding in *Ag Pro* seemed to reject the holding of *Adams*, in which an unexpectedly good result arising from substitutions was a central feature in the determination that these were *not* "merely equivalent substitutions."[147] The future of the Trilogy was in question as the Supreme Court seemed to ignore the significance of secondary considerations and the *Graham* framework in its determination of obviousness.[148]

VI. CURRENT VIEWS AND CURRENT ISSUES OF NON-OBVIOUSNESS IN THE FEDERAL CIRCUIT

A. Decisions on Non-Obviousness: A Return to the Indicia of the Trilogy

After the *Anderson's-Black Rock* and *Ag Pro* decisions, confusion prevailed among the district courts and various circuits in their applications and opinions on § 103. Such a result clearly arose from the Supreme Court's own mutually incompatible rules in the *Great Atlantic & Pacific Tea Co.*, *Graham*, *Anderson's-Black Rock*, and *Ag Pro* line of cases.[149] The most consistent rulings, and by some interpretation the most correct, were from courts that adhered to the *Graham* rules and relegated the later Supreme Court cases as inapplicable special fact situations.[150] For example, the Court of Claims and the Court of Customs and Patent Appeals largely adhered to *Graham*.[151] The regional circuits however, usually attempted to superimpose rules of other Supreme Court cases over those of *Graham*, forming a highly unpredictable forum in which to litigate patent validity and infringement. Interestingly, one of the more consistent circuits was the Eight Circuit, which held every single patent it examined *invalid* over the twenty year period from 1950 to 1970.[152]

With the creation of the Court of Appeals for the Federal Circuit in 1982, a new era of predictability of patent validity and infringement was ushered in, and many of the problems with forum shopping that had plagued patent litigation until that time promised to end.[153] All patent appeals, whether from the Patent and

145. *See id.* at 274–75.
146. *See id.* at 281–83.
147. United States v. Adams, 383 U.S. 39, 51 (1966).
148. *See Sakraida*, 425 U.S. at 279–80.
149. *See* KAYTON, *supra* note 3, at 5.17, 5.20.
150. *See id.* at 5.19.
151. *See id.*
152. *See id.* In 1971, the Eighth Circuit held a patent valid by overruling the trial judge who stated that, even though utility and novelty were established, he was obliged to hold the patent invalid on the basis of obviousness, due in part to the Eighth Circuit's hostility to patent validity. *See* Woodstream Corp. v. Herter's, Inc., 312 F. Supp. 369, 370–71 (D. Minn. 1970), *rev'd*, 446 F.2d 1143 (8th Cir. 1971).
153. *See* MILLER & DAVIS, *supra* note 6, at 121–23 (1990).

Trademark Office, the Court of Claims, or any district court, were funneled to the Federal Circuit, to which *certiorari* may be granted to the Supreme Court.[154]

B. The Federal Circuit's Current View of Non-Obviousness

Creation of the Federal Circuit in 1982 has generally resulted in predictability in litigating patent infringement under § 103. This predictability derived from an *en banc* decision in which the Federal Circuit determined that the holdings of its predecessor courts, the Court of Claims and the Court of Customs and Patent Appeals, which had adhered to *Graham*'s secondary considerations, were *binding precedent* in the new Federal Circuit.[155] This single holding promised future consistency for § 103 non-obviousness inquiries in the Federal Circuit; a promise that has largely been fulfilled through the maturing case law in this area. The Federal Circuit's current view of non-obviousness reflects its fine-tuning of the Trilogy's indicia, and has recently been summarized by Professor Kayton.[156] Kayton's synopsis of § 103 highlights, as illustrated by recent Federal Circuit cases, includes the following propositions.

1. There is a single standard for non-obviousness for all types of inventions since most, if not all, inventions are to some extent innovative *combinations* of known elements.[157] In *Kimberly-Clark Corp. v. Johnson & Johnson*, the Federal Circuit described this conclusion: "It is immaterial...that all of the elements were old in other contexts. What must be found obvious to defeat the patent is the claimed combination."[158]

2. In examining the differences between the claims at issue and the prior art (the second factual inquiry of *Graham*), the court must view the claims at issue as the invention as a whole.[159] Thus, it is essential to consider *all* elements of the claimed invention and it is not permissible to compare the prior art with the gist of the invention to be, nor is it permissible to focus on the obviousness of substitutions and differences between the claimed invention and the prior art.[160]

3. The objective indicia of *Graham* are the most powerful evidence of non-obviousness, and properly should be considered as the fourth factual inquiry

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154. *See id.*

155. *See* South Corp. v. United States, 690 F.2d 1368, 1369 (Fed. Cir. 1982).

156. *See* KAYTON, *supra* note 3, at 5.20–.24.

157. *See* Panduit Corp. v. Dennison Mfg. Co., 810 F.2d 1561, 1575 (Fed. Cir. 1987); Medtronic, Inc. v. Cardiac Pacemakers, Inc., 721 F.2d 1563, 1566 (Fed. Cir. 1983); Environmental Designs, Ltd. v. Union Oil Co., 713 F.2d 693, 698 (Fed. Cir. 1983).

158. Kimberly-Clark Corp. v. Johnson & Johnson, 745 F.2d 1437, 1448 (Fed. Cir. 1984).

159. *See generally* Hybritech Inc. v. Monoclonal Antibodies, Inc., 802 F.2d 1367 (Fed. Cir. 1986); Perkin-Elmer Corp. v. Computervision Corp., 732 F.2d 888 (Fed. Cir. 1984).

160. *See* Vas-Cath Inc. v. Muhurkar, 935 F.2d 1555 (Fed. Cir. 1991).

in the *Graham* test.[161] A determination of obviousness through an after-the-fact examination of the invention with the teachings of the inventor available is not acceptable and, in fact, is refuted by the non-obviousness indicia.[162]

4. In determining the level of ordinary skill in the relevant art, the third factual inquiry of *Graham*, the criteria described in *Environmental Designs, Ltd. v. Union Oil*[163] and *Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc.*,[164] are to be considered. These criteria include the type of problems encountered in the art, prior art solutions to those problems, the rate at which innovations in the art are made, the sophistication of the technology, and the educational level of active workers in the field, *excluding* the inventor.[165] The educational level of the inventor is specifically *not* to be considered.[166]

5. A decision by the Patent and Trademark Office ("PTO") or the district courts concerning obviousness cannot be made *without* evaluating the objective evidence of non-obviousness, including *Graham*'s secondary considerations.[167]

6. Obviousness is to be judged from the prior art inventions themselves, without recourse to the teachings of the patent application or patent itself.[168] Without an independent suggestion of obviousness, the prior art becomes a mere suggestion for unguided experimentation, which is *not* the standard for obviousness.[169]

C. Practical Considerations in Attacking Prima Facie Obviousness

In order to fully appreciate the scope of the Federal Circuit's judgments on non-obviousness, it is useful to examine selected cases in which patent validity has been attacked on § 103 grounds, and the Federal Circuit's response to that attack. These practical guidelines regarding prima facie obviousness have been adapted from Professor Kayton's extensive look at this subject.[170]

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161. *See* Simmons Fastener Corp. v. Illinois Tool Works, 739 F.2d 1573, 1575 (Fed. Cir. 1984) (referring to the secondary considerations as *Graham*'s fourth factual inquiry).

162. *See In re* Piasecki, 745 F.2d 1468, 1471–75 (Fed. Cir. 1984).

163. 713 F.2d 693, 696–97 (Fed. Cir. 1983).

164. 796 F.2d 443, 449–50 (Fed. Cir. 1986).

165. *See id.*

166. *See* Stewart-Warner Corp. v. City of Pontiac, 767 F.2d 1563, 1570 (Fed. Cir. 1985).

167. *See* Panduit Corp. v. Dennison Mfg. Co., 810 F.2d 1561, 1575 (Fed. Cir. 1987); Hodosh v. Block Drug Co., 786 F.2d 1136, 1143 n.5 (Fed. Cir. 1986); Simmons Fastener Corp. v. Illinois Tool Works, 739 F.2d 1573, 1575 (Fed. Cir. 1984).

168. *See In re* Amgen, Inc. v. Chugai Pharm. Co., 927 F.2d 1200 *passim* (Fed. Cir. 1991); *In re* Dow Chem. Co., 837 F.2d 469, 473 (Fed. Cir. 1988).

169. *See In re Amgen*, 927 F.2d at 1200 *passim*; *In re Dow Chem. Co.*, 837 F.2d at 473.

170. *See* KAYTON, *supra* note 3, at 5.29–.39C.

1. Obviousness in Combination Patents Requires a Basis for that Combination

Mere combination of prior art, without the prior art *teaching* that combination, is insufficient to establish obviousness. As the Federal Circuit established in *ACS Hospital Systems, Inc. v. Montefiore Hospital*, "Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination."[171] Thus, a combination patent cannot be invalidated by using the patent to examine prior art for claimed elements, and then combining them as claimed.[172]

2. The Needle in a Haystack Problem: An "Obvious to Try" Modification Is Not Prima Facie Obviousness[where does "OtT" come from?]

Even if prior art teaches a particular modification or combination, accomplishing that combination successfully may not constitute an obvious invention if there is no *reasonable* expectation of the success of that teaching.[173] Thus, "obvious to try" is not prima facie obviousness. This is the classic "needle in a haystack" problem where the references may suggest what an inventor has done, but that suggestion contains no *reasonable* expectation of the invention being successfully carried out. For example, if the only barrier to preparing a new anti-tumor drug is finding an oxidant with a very specific redox potential, the patent will not be invalidated if the inventor was successful in identifying the proper compound from among the millions of possible choices through trial-and-error diligence or through simple luck.[174] The implications of this result in affording protection of new drug and pharmaceutical designs are highly significant.

3. Lack of Technological Motivation Negates Obviousness

If prior art is combined or modified in a way that negates its intended function, *i.e.* there is a *disincentive* for the combination, then § 103 obviousness cannot be established.[175] Thus, if there is no technological motivation for a particular combination, then the result is non-obvious.

4. A Combination Using Non-analogous Art Is Non-Obvious

If references to prior art are so remote from the art of the claimed invention that the person of ordinary skill would not seek to solve the problem

171. ACS Hosp. Sys., Inc. v. Montefiore Hosp., 732 F.2d 1572, 1577 (Fed. Cir. 1984) (footnote omitted).

172. *See In re* Zurko, 111 F.3d 887, 888–90 (Fed. Cir. 1997), *rev'd*, 527 U.S. 150 (1999). *See also* KAYTON, *supra* note 3, at 5.30.

173. *See In re* Clinton, 527 F.2d 1226, 1228 (C.C.P.A. 1976).

174. *See In re* Goodwin, 576 F.2d 375, 377 (C.C.P.A. 1978).

175. *See In re* Gordon, 733 F.2d 900, 902 (Fed. Cir. 1984).

addressed in the invention using these remote arts, then § 103 obviousness cannot be established.[176] However, determining exactly what constitutes "non-analogous art" requires particular scrutiny. If the prior art reference is not within the field of the inventor's endeavor, then a court should "proceed to determine whether the reference is reasonably pertinent to the particular problem with which the inventor was involved."[177] The Federal Circuit has simply stated that it is necessary to use "common sense" in deciding the issue of whether prior art was non-analogous.[178]

5. If Prior Art Does Not Recognize the Problem, Its Inventive Solution Is Non-Obvious

The classic case in this area is *Eibel Process Co. v. Minnesota and Ontario Paper Co.* which stands for the proposition that discovering the source of a problem can result in a non-obvious invention, even if the solution to that problem would have been obvious *once the source was known.*[179] Such a holding reflects the § 103 statutory requirement of determining obviousness by considering the "subject matter as a whole."[180] Similarly, the *Peehs* court held that where the advance in the art is in the discovery of the problem, prima facie obviousness can only be established if a person of ordinary skill in the art at the time of the invention would have recognized that a problem existed.[181]

6. Routine Steps in a Process Patent Are Not Prima Facie Obvious When the Material It Produces (or Uses) Is Patentable

Until recently, the law seemed to state that a prior art process *is* prima facie obvious even when the material produced or used in the process is itself patentable.[182] However, in 1990, the Federal Circuit in *In re Pleuddemann* held that a known process of *using* a patentable compound was necessarily patentable where the court properly analyzed the claims in their entirety as required by the *Graham* factors.[183] In 1995, the Federal Circuit specifically held that when the starting materials and products are themselves patentable, such patentability will render the claimed process itself patentable.[184] Such a holding affords overlapping patent protections. For example, the inventors of a new drug will be protected since both the drug and any synthetic process by which it is made are patentable.

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176. *See In re* Pagliaro, 657 F.2d 1219, 1224–25 (C.C.P.A. 1981).

177. *In re* Wood, 599 F.2d 1032, 1036 (C.C.P.A. 1979).

178. *In re* Oetiker, 977 F.2d 1443, 1447 (Fed. Cir. 1992).

179. *See generally* Eibel Process Co. v. Minnesota and Ontario Paper Co., 261 U.S. 45 (1923).

180. 35 U.S.C.A. § 103(a) (1998).

181. *See In re* Peehs, 612 F.2d 1287, 1290 (C.C.P.A. 1980).

182. *See In re* Durden, 763 F.2d 1406, 1409–11 (Fed. Cir. 1985).

183. *See In re* Pleuddemann, 910 F.2d 823 (Fed. Cir. 1990).

184. *See In re* Ochiai, 71 F.3d 1565, 1569–70 (Fed. Cir. 1995). *See also In re* Brouwer, 77 F.3d 422, 425–26 (Fed. Cir. 1996).

VII. THE INTERSECTION OF NON-OBVIOUSNESS AND THE DOCTRINE OF EQUIVALENTS

As detailed in § 112 of the Patent Act, the "specification" of a patent includes a written description of the invention, an explanation that will enable any person skilled in the art to make and use it, and a disclosure of the best mode contemplated by the inventor of carrying out the invention.[185] The specification must conclude with one or more specific claims that concisely articulate the invention.[186]

Claims are the heart of a patent and define the limits of the intellectual property to be protected. Patent practitioners typically define the patent's first claim as broadly as the prior art will permit, and sequentially narrow their scope as successive claims are presented, to attain full coverage of the intellectual property to be protected.[187] Narrowing claims from this original claim of broad patent coverage is usually accomplished by either adding additional elements to successive claims, or by modifying an existing element within a broader claim.[188] When an infringer reproduces an invention, outright duplication or "literal infringement" is quite rare. Instead, the infringer usually attempts to make sufficient modifications that will bypass the patent protection of the original invention.[189] Issues such as the extent to which a replica infringes the claimed invention, and consequently just how broadly or narrowly a series of claims protects an invention, have been litigated under the doctrine of equivalents.[190] The intersection of the concepts of statutory non-obviousness and the doctrine of equivalents must be explored, since they are based on parallel notions: when is a potential infringing invention so close to the original that it is considered an obvious or equivalent extension of the original?

A. The Doctrine of Equivalents

The doctrine of equivalents stands for the proposition that, absent *literal* infringement, a purported infringing device may nonetheless be held to infringe if it is *substantially the same* as the claimed invention.[191] The historical test for "equivalents" relied upon by the courts, as set forth in *Graver Tank & Mfg. Co. v. Linde Air Products Co.*, has been whether the possible infringing device "'performs substantially the same function in substantially the same way to obtain

185. *See* 35 U.S.C.A. § 112.
186. *See id.*
187. *See* KAYTON, *supra* note 3, at 3.2–.11.
188. *See id.*
189. *See id.* at 2.25.
190. *See, e.g.*, Graver Tank & Mfg. Co. v. Linde Air Prods. Co., 339 U.S. 605 (1950).
191. *See id.* at 607–08. Note that the *Graver Tank* decision antedated the 1952 Patent Act which codified non-obviousness as described above.

the same result.'"[192] Without such an outcome, the Court reasoned, patent protection would become ineffectual since the unscrupulous imitators would "make unimportant and insubstantial changes and substitutions in the patent which, though adding nothing, would be enough to take the copied matter outside the claim, and hence outside the reach of the law."[193] If a person of "ordinary skill in the art" recognizes a substitution as inconsequential and it results in an equivalent function, then equivalence may perhaps be established.[194] However, things not normally viewed as equivalent *may* be found to be equivalent in a particular invention if their utility is based on an equivalence of function. For example, in *Textronix, Inc. v. United States*, "a pair of series connected diodes" was stipulated in the claim, but the infringer utilized series connected triodes in some cases, and series connected pentodes in others.[195] The *Textronix* court found that the triodes and pentodes of the infringing device were used exclusively for their diode function, and not for their unique functions; accordingly, the court held infringement by the triode and pentode devices by equivalence.[196] Such a determination is intensely fact-specific however, since using known technology in unique ways is the basis of invention, making established or conventional equivalence difficult to apply.[197]

B. The Doctrine of Equivalents After Warner-Jenkinson

The doctrine of equivalents has been controversial, and since the time of *Graver Tank*, courts have struggled to strike a balance between the fundamental need that the doctrine addresses and the necessity for predictability and consistency in patent practice. Indeed, through the 1980s and 1990s a number of panel decisions by the Court of Appeals for the Federal Circuit have questioned the applicability of the doctrine and have suggested its limited use.[198] The doctrine has been described as "a virtually uncontrolled and unreviewable license to juries to find infringement if they so choose."[199] In March of 1997, the Supreme Court addressed the doctrine of equivalents for the first time since *Graver Tank* in *Warner-Jenkinson Co. v. Hilton Davis Chemical Co.*[200]

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192. *Id.* at 608 (quoting Sanitary Refrigerator Co. v. Winters, 280 U.S. 30, 42 (1929)).

193. *Id.* at 607.

194. *See* Hilton Davis Chem. Co. v. Warner-Jenkinson Co., 62 F.3d 1512 (Fed. Cir. 1995), *rev'd and remanded*, 117 S. Ct. 1050 (1997).

195. Tektronix, Inc. v. United States, 165 U.S.P.Q. 392, 395 (Ct. Cl. 1970), *aff'd*, 445 F.2d 323 (Ct. Cl. 1971).

196. *See id.* at 396.

197. *See generally* Perkin-Elmer Corp. v. Westinghouse Elec. Corp., 822 F.2d 1528 (Fed. Cir. 1987).

198. *See* MERGES ET AL., *supra* note 51, at 242.

199. Hilton Davis Chem. Co. v. Warner-Jenkinson Co., 62 F.3d 1512, 1538 (Fed. Cir. 1995) (Plager, J. dissenting), *rev'd and remanded*, 520 U.S. 17 (1997).

200. 520 U.S. 17 (1997).

In *Warner-Jenkinson*, the plaintiff's invention of a dye purification process involved "an aqueous solution...at a pH from approximately 6.0 to 9.0...."[201] The defendant's process used a solution pH of 5.0 which the jury found to be the "equivalent" of a pH of approximately 6.0 and therefore the defendant was found liable for infringement.[202] In a divided decision, the Federal Circuit affirmed the finding of infringement.[203] Despite reversal by the Supreme Court, the three fundamental issues regarding equivalents decided in the Federal Circuit's decision remained intact. First, the three-part test of "function, way, and result" embraced in *Graver Tank* is not *the* test of equivalents, but rather the "substantiality of the differences between the claimed and accused products of processes, assessed according to an objective standard."[204] Function, way, and result merely constitute one method to assess these differences. Second, "infringement under the doctrine of equivalents is an issue of fact to be submitted to the jury in a jury trial with proper instructions, and to be decided by the judge in a bench trial."[205] If there is substantial evidence of equivalence, the jury verdict will be upheld.[206] Third, the existence of an "equitable threshold" that limits applicability of the doctrine of equivalence to *intentional* infringers was rejected.[207] Thus, while the Supreme Court reaffirmed the essential applicability of the doctrine, the decision rejected many of the theories on which limitations of applying the doctrine had been based in previous years.[208] However, the extent to which the Federal Circuit panels may implement the Supreme Court's endorsement of the doctrine remains to be seen: no published decision since *Warner-Jenkinson* has upheld a jury finding of infringement under the doctrine.

C. Relationship Between Non-Obviousness and the Doctrine of Equivalents

The protections granted by statutory non-obviousness and the judicially-created doctrine of equivalents are largely complementary.[209] Non-obviousness and equivalents are both fundamentally based on the similar notion of what is apparent and evident to a mythical person of ordinary skill in the art. Courts cannot draw a bright line between literal infringement and infringement under the doctrine of equivalents, but rather should view infringement as existing somewhere along an infringement continuum between "literal" at one extreme,

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201. *Hilton Davis*, 62 F.3d at 1515.
202. *See id.* at 1515–16.
203. *See id.* at 1528–29.
204. *See id.* at 1518.
205. *Id.* at 1522.
206. *See id.*
207. *See id.* at 1523.
208. *See* Warner-Jenkinson Co. v. Hilton Davis Chem. Co., 520 U.S. 17, 17–20 (1997).
209. *See generally* Sephton, *supra* note 112, at 1038–48.

and "equivalent" at the other.[210] As one commentator described, "[j]ust as literal infringement is similar to novelty, infringement under the doctrine of equivalents is somewhat analogous to the nonobviousness requirement mandated by 35 U.S.C. § 103...."[211]

When courts are concerned about the statutory non-obviousness of a device or process in order to determine *patent validity*, examination is made of the differences between the potentially patentable device (or process, etc.) and the prior art, typically using the *Graham* factors.[212] However, in applying the doctrine of equivalents, the court examines possible *infringement* of an accused device or process by a careful analysis of the differences between the patented invention and the accused infringing device.[213] One court described this analysis of the doctrine of equivalents as a determination of the extent to which the doctrine "casts around a claim a penumbra...."[214] Note the differences between these analyses, however. Under non-obviousness, the concern is between the *entire* relevant prior art and the claimed invention, whereas the doctrine of equivalents focuses on the difference between a single device and the claimed invention.

One important distinction that remains between non-obviousness determinations and the doctrine of equivalents relates to how the invention is perceived. Under *Pennwalt Corp. v. Durand-Wayland Inc.*, the Federal Circuit required that equivalence under the doctrine of equivalents be determined by comparing the accused device with the claims on an element-by-element basis.[215] Thus, if a single element of a claim is missing from the accused infringing device, there can be no equivalence.[216] This method was validated in *Warner-Jenkinson*,[217] whereas a determination of obviousness under the Trilogy does not *per se* require such a method.

VIII. CONCLUSION

The notion of non-obviousness, as well as the parallel concept of equivalence, have clearly evolved over time. With the inception of the Circuit Court of Appeals for the Federal Circuit in 1982, many of the problems with

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210. *See* Builders Concrete, Inc. v. Bremerton Concrete Prods. Co., 757 F.2d 255, 258 (Fed. Cir. 1985).

211. *See* Sephton, *supra* note 112, at 1070 n.30.

212. *See* Graham v. John Deere Co., 383 U.S. 1, 17–18 (1966).

213. *See* Sephton, *supra* note 112, at 1042–43.

214. Autogiro Co. of America v. United States, 384 F.2d 391, 400 (Ct. Cl. 1967).

215. *See* Pennwalt Corp. v. Durand-Wayland Inc., 833 F.2d 931, 935 (Fed. Cir. 1987) (en banc).

216. The converse of this statement is not true, however. If a single element of the accused device (and its function) is missing from the claims of the patented invention, the claims still "read on" the accused device and infringement may be found. *See, e.g.*, LEE & DAVIDSON, *supra* note 10, at 11.

217. *See* Warner-Jenkinson Co. v. Hilton Davis Chem. Co., 520 U.S. 17, 19 (1997).

inconsistent rulings on non-obviousness have been solved, since all patent appeals are channeled to the Federal Circuit.[218] Moreover, the Federal Circuit's determination that the holdings of its predecessor courts, the Court of Claims and the Court of Customs and Patent Appeals (which subscribed to *Graham*) were binding precedent in the new Federal Circuit, afforded some predictability to § 103 non-obviousness inquiries.[219]

Although this promise has largely been fulfilled, there still remain questions regarding just *how* different an invention must be from prior art before patent protection is upheld.[220] The interplay between statutory non-obviousness and judicial "equivalents," especially in the context of combination patents, suggests that this area will persist as one of active judicial interpretation. This Note concludes with three observations about the current status of non-obviousness determinations in the Federal Circuit.

First, the Federal Circuit has clearly embraced the secondary considerations of the Trilogy as indicia of non-obviousness. Until fairly recently, the checkered history of § 103 non-obviousness left patent prosecutors and litigators with a tenuous ability to predict the outcome of obviousness questions. As outlined above, these questions are now far more ascertainable. Second, the Court's *Warner-Jenkinson* decision has limited the doctrine of equivalents such that its narrow construction is expected. This suggested narrow construction of equivalents by the Federal Circuit suggests a continuing "inventor's market" in patentability issues. Finally, the extent to which *obviousness* rejections of claims under § 103 in patent prosecution reflect this narrow construction of the doctrine of equivalence is an ongoing concern, and will continue to be an area of active judicial development.

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218. This was true whether the appeal arose from the Patent and Trademark Office, the Court of Claims, or a district court. *See*, MILLER & DAVIS, *supra* note 6, at 121–23 (1990).

219. *See* South Corp. v. U.S., 690 F.2d 1368, 1369 (Fed. Cir. 1982).

220. This is especially true given statutory limitations such as the § 103 mythical person "having ordinary skill in the art," and addressing the obviousness question "at the time the invention was made." 35 U.S.C.A. § 103(a) (1998).