Enablement Estoppel: Should Prosecution History Estoppel Arise When Claims Are Amended to Overcome Enablement Rejections?

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ENABLEMENT ESTOPPEL: SHOULD PROSECUTION HISTORY ESTOPPEL ARISE WHEN CLAIMS ARE AMENDED TO OVERCOME ENABLEMENT REJECTIONS?*

Ted Apple†

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I. INTRODUCTION

It has long been appreciated that the property right contained in a patent grant is not limited to the literal scope of the claims. Courts have recognized that such a limitation would allow (even encourage) piracy of inventions and confound the goals of the patent system.¹ Instead, under the doctrine of equivalents, a patent holder’s property rights may be expanded beyond the literal scope of the patent claims to include products and processes that differ in only unimportant and

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insubstantial ways from the claimed invention. The application of the doctrine of equivalents has presented difficult problems for both the courts and for practitioners who counsel clients attempting to design around an existing patent or seeking patent protection for a new invention.

When a patentee asserts infringement under the doctrine of equivalents, he faces two significant constraints in defining the range of equivalents. First, a patentee is not allowed capture of matter that could have been found in the prior art. The rationale for this limitation is that the prior art limits what an inventor can claim, and a patentee "should not be able to obtain [under the doctrine of equivalents] coverage which he could not lawfully have obtained from the PTO by literal claims." A second constraint that limits the range of equivalents potentially available to a patentee is embodied in the doctrine of prosecution history estoppel. Under the doctrine of prosecution history estoppel, arguments and actions on the part of the patent applicant may limit his right to assert that a competing product is equivalent to the patented invention. Like the doctrine of equivalents

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3. The finder of fact makes the determination of infringement under the doctrine of equivalents. See Hilton Davis, 62 F.3d at 1522.

4. For example, defining exactly what is unimportant and insubstantial is one of the most difficult assessments made in patent cases. The most commonly used method for determining the substantiality of the change is the function-way-result test of Graver Tank & Mfg. Co., Inc. v. Linde Air Prods. Co., 339 U.S. 605, 608 (1950) (an accused product that performs "substantially the same function in substantially the same way to obtain the same result" may infringe a patent under the doctrine of equivalents). It has been argued, however, that this test is ill-suited for certain classes of inventions. Genentech, Inc. v. Wellcome Found. Ltd., 29 F.3d 1555 (Fed. Cir. 1994) (Lourie, J., concurring) (the function-way-result test is inadequate for determining the substantiality of change when the patented material is a chemical, e.g., a biologically active protein).

Note also the danger that unpredictable or unclear application of the doctrine of equivalents will lead eventually to uncertainty over the authority of the claims. See Charles Greiner & Co., Inc. v. Mari-Med, Mfg. Inc., 962 F.2d 1031, 1036 (Fed. Cir. 1992) ("Application of the doctrine of equivalents is the exception, however, not the rule, for if the public comes to believe (or fear) that the language of the patent claims can never be relied on, and that the doctrine of equivalents is simply the second prong of every infringement charge, regularly available to extend protection beyond the scope of the claims, the claims will cease to serve their intended purpose.").

5. Wilson Sporting Goods Co. v. David Geoffrey & Assocs., 904 F.2d 677 (Fed. Cir. 1990). Prior art is the information in the public domain prior to the date of invention which acts as a bar to patentability under 35 U.S.C. §§ 102(a) & (b) (1988). Publications or patents describing the invention, or use or sale of the invention before the date of the invention can, in some cases, be prior art. See 35 U.S.C. § 102(a) & (b) (1988).

lents, the doctrine of prosecution history estoppel serves as "an equitable tool for determining the permissible scope of patent claims." The subject of this article is a possible expansion of the doctrine of prosecution history estoppel. The next section provides background and explains that at least one panel of the Court of Appeals for the Federal Circuit has signaled that prosecution history estoppel may result when a patent applicant amends a claim to overcome a rejection for lack of enablement. Section III suggests that two related rationales for prosecution history estoppel can be found in the Federal Circuit decisions on the topic and argues that finding estoppel when an amendment is made in response to an enablement rejection is consistent with these rationales. Section IV contends that such estoppel is warranted in certain, but not all, cases in which a claim is amended to overcome an enablement rejection, and provides a rationale for distinguishing amendments that should or should not result in estoppel.

II. PROSECUTION HISTORY ESTOPPEL AND ENABLEMENT REJECTIONS

A. Estoppel and Non-art Rejections

Prosecution history estoppel "limits infringement by otherwise equivalent structures by barring recapture by the patentee of scope that was surrendered in order to obtain allowance of the claims." Under this doctrine, a patentee is bound by representations made be-

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8. The term prosecution history estoppel is preferred by the Federal Circuit and is used in this paper. The equivalent, older term file wrapper estoppel was used in the past and is found in many of the cases cited herein. See id. at 258.
9. Pall Corp. v. Micron Separations, Inc., 66 F.3d. 1211, 1218 (Fed. Cir. 1995). No single characterization of the doctrine of prosecution history estoppel seems to cover all circumstances in which the doctrine has been found to be applicable. The characterization by the Pall court, for example, does not account for the fact that estoppel may also result from comments made by the patentee following an indication by the examiner that the claims are allowable. See Hormone Research Found., Inc. v. Genentech, Inc., 904 F.2d. 1558, 1564 n.9 (Fed. Cir. 1990). See also Texas Instruments, Inc. v. United States Int'l Trade Comm'n, 988 F.2d 1165, 1173-1175 (Fed. Cir. 1993) (arguments made during prosecution of related applications may estop); Caterpillar Tractor Co. v. Berco, S.P.A., 714 F.2d 1110, 1116 (Fed. Cir. 1983) (instructions to foreign associates prosecuting corresponding applications may be evidence relating to prosecution history estoppel); Haynes Int'l, Inc. v. Jessop Steel Co., 8 F.3d 1573, 1578 (Fed. Cir. 1993) (applicant's failure to file continuation applications addressed to the same subject matter is evidence favoring a finding of estoppel), clarified on rehearing in part, 15 F.3d 1076 (Fed. Cir. 1994).
fore the Patent and Trademark Office (PTO) during prosecution;\textsuperscript{10} she may not, for example, argue during prosecution that a claim term has one meaning and assert a conflicting meaning later in court. Prosecution history estoppel may similarly prevent a patentee from narrowing a claim to overcome an examiner’s rejection, and subsequently asserting that the claim should be construed in a way that repudiates the original amendment. When the doctrine of prosecution history estoppel is invoked by a court, it does not entirely preclude the patentee from asserting the doctrine of equivalents and does not necessarily prevent the patentee from regaining some part of the original claim scope.\textsuperscript{11} Instead, a court will look at the circumstances under which the estopping amendment or argument was made to determine the breadth of estoppel.

Distinct categories of prosecution history estoppel may be classified according to the events leading to estoppel. "Classical estoppel"\textsuperscript{12} occurs when an applicant amends a claim in order to differentiate the claimed matter from prior art cited by the examiner.\textsuperscript{13} The applicant is then estopped from later asserting that his claim encompasses the surrendered matter. If the surrender is a consequence, not of an amendment, but of an argument or representation made by the applicant to overcome an art rejection,\textsuperscript{14} the estoppel is phrased "estoppel by admission."\textsuperscript{15} The term "art-estoppel" can be used to describe any estoppel (including classical estoppel and estoppel by admission) in which the estoppel arises from an applicant’s response to an examiner’s prior art rejection. In a case in which the amend-

\textsuperscript{10} Exhibit Supply Co. v. Ace Patents Corp., 315 U.S. 126, 136 (1942). Prosecution refers to the negotiations that take place between the patent applicant and the PTO regarding the patentability of the claimed invention. Usually, the applicant will be required to amend her proposed claims before a patent is issued.

\textsuperscript{11} See discussion infra Part IV.

\textsuperscript{12} This term, and some others used to describe types of estoppel, are adopted from Carole F. Barrett, The Applicability of the Doctrine of File Wrapper Estoppel to Prevent Recapture of Abandoned Patent Claims, 54 St. John’s L. Rev. 767 (1980).

\textsuperscript{13} Reference is made throughout this article to estoppel resulting from claim amendments. It should be appreciated by the reader that a change in claim scope achieved by canceling claims, or by some combination of canceling claims, amending claims, and filing new claims, will have the same practical and legal effect. See, e.g., 4 Donald S. Chisum, Patents: A Treatise on the Law of Patentability, Validity, and Infringement, § 18.05[2], at 18-158 (1996) and at text accompanying notes 4-5.2, and cases cited therein.

\textsuperscript{14} Art rejection refers to a rejection based on prior art, e.g., a rejection for lack of novelty under 35 U.S.C. § 102(a), (b), or (c), or for obviousness under 35 U.S.C. § 103(a). Conversely, a non-art rejection refers to a rejection not citing prior art, e.g., for lack of utility under 35 U.S.C. § 101 or lack of an enabling specification under 35 U.S.C. § 112.

\textsuperscript{15} See Barrett, supra note 12.
ment or representation is made to overcome a rejection that is not based on prior art, any resulting estoppel can be called "non-art estoppel."\(^{16}\)

The historical trend has been to broaden the types of actions that can result in the application of doctrine of prosecution history estoppel.\(^{17}\) Thus by 1980, in addition to recognizing classical estoppel, the courts in many circuits also recognized estoppel by admission.\(^{18}\) However, relatively few courts at the time recognized non-art estoppel\(^{19}\) and at the time of the creation of the Court of Appeals for the Federal Circuit,\(^{20}\) prosecution history estoppel was expressly limited in several circuits to cases in which the estopping amendments and comments were related to prior art rejections.\(^{21}\)

The Federal Circuit has rejected this limitation. Instead, it is apparent that the Federal Circuit accepts, at least in principle, the notion of estoppel resulting from arguments and amendments made in response to non-art rejections.\(^{22}\) There have been relatively few rul-

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16. \textit{Id.} at 772.
17. \textit{See generally} Barrett, \textit{supra} note 12, at 786.
18. \textit{Id.} However, there was no uniformly accepted standard for estoppel by admission.
19. \textit{Id.}
21. \textit{See}, e.g., Trio Process Corp. v. L. Goldstein's Sons, Inc., 461 F.2d 66, 75 (3rd Cir. 1972) ("For 'file wrapper estoppel' to become operable, it is necessary, at the least, that a claim have been narrowed to avoid the prior art."). Limitation of the doctrine by courts continues to occur notwithstanding contrary controlling precedent. \textit{See}, e.g., Johnstown Am. Corp. v. Trinity Indus., Inc., 865 F. Supp. 1159, 1164-65 (W.D. Penn. 1994) ("Prosecution history estoppel does not apply when claim language is amended for some reason other than to avoid prior art.").
22. \textit{See also} Barrett, \textit{supra} note 12, at 780-786 (reviewing the split in the circuits regarding the applicability of prosecution history estoppel to non-art amendments) and Pall Corp. v. Micron Separations, Inc., 792 F. Supp. 1298, 1326 (D. Mass. 1992) (contrasting the view of the Third Circuit that only amendments made to overcome prior art rejections estop the patentee from invoking the doctrine of equivalents with the views of the First, Fourth, and Ninth Circuits to the contrary).
23. \textit{See} Pall Corp. v. Micron Separations, Inc., 66 F.3d 1211, 1220, 1231 (Fed. Cir. 1995). When amendments and arguments are made to impart precision rather than to overcome prior art, the "prosecution is not presumed to raise an estoppel, but is reviewed on its facts, with the guidance of precedent [citing four cases]" (emphasis added). \textit{Pall} is discussed \textit{infra} at text accompanying notes 28-33 and accompanying text.

The Federal Circuit's acceptance of non-art estoppel by amendment has not always been apparent. In its first case addressing prosecution history estoppel, the Federal Circuit characterized the doctrine as applying "to claim amendments to overcome rejections based on prior
ings by the Federal Circuit regarding non-art estoppel, however, and
the range of circumstances in which prosecution history estoppel can
result from arguments or amendments made to overcome a non-art
rejection remain undefined. This article explores the application of
the doctrine of prosecution history estoppel when amendments are
submitted by a patent applicant to overcome a particular type of non-
art rejection: enablement rejections made under § 112 of the patent
laws.23

Section 112 imposes several requirements on the patent appli-
cant, chiefly in the first and second paragraphs. The first paragraph
of § 112 sets forth the requirement for an enabling disclosure: in the
patent specification, the applicant must instruct how to make and
utilize the invention.24 Full disclosure enables others to make the in-
vention once the patent grant has expired and, more importantly,
places information that competitors can use for further research and
invention into the public domain. The enablement requirement can
be viewed as a bargain: in exchange for full disclosure of an inven-
tion, the inventor is awarded a property right. Implicit in this bargain
is the notion that the inventor should receive a patent that covers no
more than what she has invented. When an inventor attempts to
claim more than she discloses (i.e., when the disclosure of the speci-
fication is not commensurate in scope with the subject matter encom-
passed by the claim) the claim is rejected as "not enabled."25

The second paragraph of § 112 requires that the claims describe
the invention with precision and definiteness.26 A claim that includes

24. Id. In addition, the first paragraph of § 112 requires that the specification contain a
written description of the invention, and that inventor disclose the best mode known to him for
making or using the invention.
25. In re Borkowski, 422 F.2d 904, 909 (C.C.P.A. 1970). To be enabling, "the specifi-
cation of a patent must teach those skilled in the art how to make and use the full scope of the
claimed invention without undue experimentation." In re Wright, 999 F.2d 1557, 1561 (Fed.
Cir. 1993). When a genus is claimed, the specification must provide guidance that allows one
of skill to determine, without undue experimentation, which species encompassed by the genus
are those with the desired properties. In re Vaeck, 947 F.2d 488 (Fed. Cir. 1991).
26. 35 U.S.C. § 112 (1988). The second paragraph also specifies that the claims must be
directed to the subject matter "which the applicant regards as his invention."
language that is indefinite, in the sense that one of skill in the art would not be able to discern the “metes and bounds” of the claimed subject matter, is rejected under § 112, second paragraph.

**B. The Pall Decision**

The Federal Circuit recently stressed in dicta its endorsement of non-art estoppel, specifically citing § 112.27 In *Pall Corp. v. Micron Separations Inc.*,28 the defendant in an infringement suit argued that the plaintiff-patentee should be estopped by the prosecution history from asserting infringement under the doctrine of equivalents. The defendant asserted that statements made by the patent applicant to overcome an enablement rejection under § 112, first paragraph, formed the basis of the estoppel.29 In turn, the plaintiff argued that no estoppel could be found because the allegedly estopping statements had not been made to overcome a prior art rejection. The district

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27. “Non-art estoppel” is defined supra Part II.A.


29. The facts of the case are somewhat complicated; those relevant to the estoppel issue are briefly summarized here. Pall Corporation (Pall) held a patent for a nylon membrane made from a polyamide resin and useful for microfiltration. Pall had originally submitted a parent patent application containing broad claims which specified no upper or lower limit on the methylene: amide ratio of the polyamide resin. As a result of additional research, however, Pall decided that its original view of usable nylon resins was too broad. Pall discovered, for example, that resins with methylene: amide ratios of 3:1, in the lower range, or 8:1, in the upper range, did not work. Based on this new information, Pall filed the continuation-in-part application (CIP) that ultimately matured into the allegedly infringed patent. The CIP claimed resins having methylene: amide ratios “within the range of about 5:1 to about 7:1.” The lower limit of 5:1 represented the lowest ratio resin, of those tested by Pall, that was operative. The examiner rejected the new, narrowed, claims under § 112 as too broad and not supported by the disclosure. In traversing the rejection, Pall argued that the claimed range was “rather narrow” and excluded the “vast majority of polyamide resins.”

*Micron Separations, Inc.*, (Micron) was accused of infringing Pall’s patent by marketing a membrane made from a resin with a methylene: amide ratio of 4:1, below the range recited in Pall’s claims but above the range tested (and found inoperative) by Pall. Both the District Court and the Federal Circuit found that the 4:1 membrane did not literally infringe the membrane claimed by Pall. It was Micron’s position that Pall was estopped from establishing infringement under the doctrine of equivalents because Pall “voluntarily gave up claim scope that would have literally included [Micron’s membrane]” during prosecution of the patent. *Pall Corp. v. Micron Separations, Inc.*, 66 F.3d at 1217-18. Pall, in turn, argued that no estoppel should be found because no claim scope was required to be yielded due to prior art or based on any requirement of patent examination. Both the district court and the Federal Circuit held that (1) estoppel was not limited to art rejections, but (2) there was no estoppel in this case. The district court noted that Pall was under no obligation to experiment with “every possible methylene to amide combination in order to claim the patented invention.” *Pall Corp. v. Micron Separations, Inc.*, 792 F. Supp. 1298, 1327 (D. Mass. 1992). Both courts found that Micron had infringed under the doctrine of equivalents.
court held that no estoppel existed. In affirming the district court’s decision, the Federal Circuit was clear in rejecting the assumption that prosecution history estoppel is limited to amendments made to overcome prior art rejections. The court explained that “[w]hether amendment or argument made in response to a rejection under Section 112 produces an estoppel, as does an amendment made to obtain allowance in view of cited references, is dependent on the particular facts.”

Both the context of the Pall court’s reference to “Section 112” and the facts of the case indicate that the court’s reference to § 112 is meant to include the first paragraph of the section, requiring an enabling disclosure. This is notable because the few Federal Circuit decisions antedating Pall that discuss § 112 and prosecution history estoppel refer to the second paragraph of the section, requiring definiteness, rather than the first paragraph. The Pall court’s dicta sug-

32. The context of the sentence cited is as follows:
The estoppel asserted by [Micron] arose not from prior art but from Pall’s statement to the examiner, in response to the rejection that the claims were too broad and unsupported by the disclosure, that the claims were “actually rather narrow.” There were no changes made in the claims in response to this rejection. A rejection for lack of support in the specification is deemed a rejection under 35 U.S.C. § 112, first paragraph [citation omitted]...

Section 112, first paragraph, states in part:
The specification 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...

Whether amendment or argument made in response to a rejection under § 112 produces an estoppel, as does an amendment made to obtain allowance in view of cited references, is dependent on the particular facts.

Id.

33. The allegedly estopping remark was made in response to a rejection for nonenabling under § 112, first paragraph.
34. See, e.g., Caterpillar Tractor Co. v. Berco, S.P.A., 714 F.2d 1110 (Fed. Cir. 1983); Mannesmann Demag Corp. v. Engineered Metal Products Co., Inc., 793 F.2d 1279 (Fed. Cir. 1986). The Federal Circuit has never reported finding estoppel based in a response to a section 112 rejection. This has lead some commentators and lower courts to incorrectly conclude that prosecution history estoppel exists only when claims are amended to avoid prior art. See, e.g., Johnstown Am. Corp. v. Trinity Indus., Inc., 865 F. Supp. 1159 (W.D. Pa. 1994).

The Federal Circuit has encountered estoppel and enablement in at least one case other than Pall. In Sun Studs, Inc. v. ATA Equip Leasing, Inc., 655 F. Supp. 1013 (D. Or. 1987), vacated in part, on reconsideration, 872 F.2d 978 (Fed. Cir. 1989), the Federal Circuit reversed a district court judge’s action overturning a jury verdict. The patent at issue related to a method for processing lumber using a computer-controlled apparatus. The claims were rejected by the PTO under § 112, first paragraph, because the examiner asserted that there was an
suggests the possibility of an extension of the doctrine of prosecution history estoppel in which arguments and amendments made to overcome rejections for lack of enablement could result in estoppel.

The Federal Circuit's refusal to rule out the possibility of estoppel based on amendments made to overcome an enablement rejection does not, of course, constitute *endorsement* of such an extension of estoppel. The remainder of this article considers whether "enablement estoppel" is consistent with the purposes of the doctrine of prosecution history estoppel as articulated by the Federal Circuit.

C. Estoppel and Enablement Rejections

Before considering the policy bases of prosecution history estoppel, it will be useful to sketch out a situation in which estoppel based on a response to an enablement rejection might arise. The following hypothetical example illustrates the concept of enablement

35. The term "enablement estoppel" is used by analogy to terms such as "art estoppel," supra text accompanying note 13, to refer to prosecution history estoppel arising from amendments made to overcome enablement rejections.

36. The discussion that follows is concerned exclusively with the potential estopping effect of amendments made to overcome an enablement rejection and does not concern the potential estopping effect of arguments made to overcome rejections under §112, first paragraph. It is not difficult to imagine how an argument made in response to an enablement rejection might be estopping. For example, an examiner might reject a claim to a method for extracting fibers from a "plant" on the grounds that the specification does not enable extraction from fungi (which, in some historical classification systems, are considered members of the plant kingdom). If the applicant concedes that extraction from fungi is not enabled, but overcomes the rejection by arguing that fungi are not considered plants by those of skill, she might then be estopped from asserting that the doctrine of equivalents should allow the claim to encompass extraction from fungi. Provided with an appropriate fact pattern, there does not seem to be any policy, theoretical, or precedential barrier to finding estoppel based on arguments made to overcome rejections under §112, first paragraph.

37. The facts are loosely based on those of *Coulter Elecs., Inc. v. J.T. Baker Chem. Co.*, 487 F. Supp. 1172 (N.D. Ill. 1980). The *Coulter* court held that the doctrine of prosecution history estoppel did not apply to amendments made to overcome rejections not based on prior art, and adopted an "intent to abandon" test for estoppel. *Id.* at 1174-75. The court also stated that the claim element at issue (metallic phosphates) "had nothing to do with the patentability of the invention." *Id.* at 1175.
estoppel. Consider a patent application for a novel blood diluent, in which the applicant’s originally filed claim is to a composition comprising “1% sucrose in an osmotically balanced solution of metallic phosphates.” The examiner rejects the claim under § 112, first paragraph, as “broader than the enabling disclosure in the recitation of the enormously broad term ‘metallic phosphates.’” In response, the applicant amends the claim, replacing the generic term, metallic phosphates, with “sodium phosphate,” a specific metallic phosphate for which the specification provides ample support. Consequently, the patent issues. When a competitor later markets a blood diluent identical to the plaintiff’s except for the use of potassium phosphate in place of sodium phosphate, the applicant (now patentee) sues, asserting infringement under the doctrine of equivalents. In defense, the competitor asserts that, by narrowing the original amendment in order to secure allowance of the claim, the plaintiff has surrendered compositions containing metallic phosphates other than sodium phosphate and is now estopped from claiming them.

Should the plaintiff above be estopped from regaining claim scope that was surrendered in order to obtain patent allowance? On the facts presented here most patent attorneys would find such a result to be profoundly unfair, particularly because sodium phosphate and potassium phosphate are known by chemists to be interchangeable in many applications. On different facts in which the alleged equivalent has been more specifically rejected and surrendered, however, estoppel based on an amendment to overcome an enablement rejection might seem to lead to the correct result. For example, imagine that the examiner had rejected “metallic phosphates” as overbroad because only one of two classes of metallic phosphates was enabled: the specification teaches how to make and use “alkali-metal phosphates” (one class of metallic phosphates) but not “alkaline-earth metal phosphates” (a second class of metallic phosphates). The claim might then be amended to recite “1% sucrose in an osmotically balanced solution of alkali-metal phosphates.” If,

38. A diluent is a diluting agent, in this case used for dilution of blood in order that individual blood cells can be counted.


40. The “alkali-metals” are elements of group Ia of the periodic table, including lithium, sodium, potassium, cesium, and others. The “alkaline-earth metals” are found in group IIa of the periodic table and include calcium, beryllium, magnesium, barium and others. See 15 THE NEW ENCYCLOPEDIA BRITANNICA, CHEMICAL ELEMENTS 931 (1990).
through independent research, a competing manufacturer develops a similar blood diluent containing barium phosphate, an alkaline-earth metal phosphate whose interchangeability with alkali-metal phosphates was not generally appreciated, it might appear reasonable to estop the patent holder from obtaining rights, under the doctrine of equivalents, to a composition that he has neither claimed nor enabled. In a case in which the equivalence (of a claimed and accused invention) could not have been foreseen at the time the patent issued or was filed, an applicant's removal of specific subject matter from the literal scope of the claims might be seen as a signal to a competitor that, should the competitor go to the expense of identifying a previously unknown similar embodiment, he would not be subject to suit for infringement.

The Federal Circuit, having rejected the notion that prosecution history estoppel is limited to arguments and amendments made in response to art rejections, has not yet made clear whether—or when—amendments made to overcome enablement rejections will result in estoppel. It is possible to construct a set of facts, as in the hypothetical above, in which enablement estoppel seems to lead to a reasonable outcome. The next section considers whether enablement estoppel is consistent with the policy bases the Federal Circuit has set forth for prosecution history estoppel.

III. THE POLICY BASIS OF PROSECUTION HISTORY ESTOPPEL

Although the Federal Circuit has accepted non-art estoppel in principle, the outer bounds of the court's vision of prosecution history estoppel remain unclear. One way to approach the issue of expanding the doctrine to include enablement estoppel is to ask whether enablement estoppel conforms to the policy basis of prosecution history estoppel as it is now applied. Unfortunately, no single underlying rationale for prosecution history estoppel has been authoritatively stated, although a variety of rationales for prosecution history estop-
pel has been suggested by commentators and courts. The decisions of the Federal Circuit suggest that the court has adopted two overlapping rationales for prosecution history estoppel. The first emphasizes the notice function of the prosecution history, and the second stresses the importance of the process of patent examination.

A. Notice

According to the notice rationale, a patentee's competitors are entitled to rely on the prosecution history of an issued patent to interpret the claims and estimate the range of claim equivalents, thereby avoiding liability for infringement. The Federal Circuit endorsed notice as a basis for prosecution history estoppel, holding, for example, that a patentee who attempted to invoke the doctrine of equivalents was "estopped from... broadening the description of a claim element limited during prosecution so as to encompass a structure which a competitor should reasonably be entitled to believe is not within the legal boundaries of the patent claims in suit." The requirement that the patentee be bound by the prosecution


44. The prosecution history becomes a public document after the patent is issued. 37 C.F.R. § 1.11(a)(1995).

45. Prodyne Enters., Inc. v. Julie Pomerantz, Inc., 743 F.2d 1581, 1583 (Fed. Cir. 1984) (emphasis added). See also Zenith Lab., Inc. v. Bristol-Myers Squibb Co., 19 F.3d 1418, 1424 (Fed. Cir. 1994) (standard for determining what subject matter is relinquished is “measured from the vantage point of what a competitor was reasonably entitled to conclude, from the prosecution history, that the applicant gave up to procure issuance of the patent”); Haynes Int’l, Inc. v. Jessop Steel Co., 8 F.3d 1573, 1578 (Fed. Cir. 1993) (following Prodyne); Hognas AB v. Dresser Indus., Inc., 9 F.3d 948, 952 (Fed. Cir. 1993) (finding estoppel based on what “a reasonable competitor was entitled to conclude”); Kinzenbaw v. Deere & Co., 741 F.2d 383, 389 (Fed. Cir. 1984) (“The file on [appellant’s] patent, to which the public had access, explicitly showed that in response to the examiner’s rejection, [appellant] narrowed his claims... [appellant has offered] no convincing reason why a competing manufacturer was not justified in assuming that if he built a planter in which the radius of the wheels was greater than that of the disc, he would not infringe the... patent.”).

Cf. Lemelson v. General Mills, Inc, 968 F.2d 1202, 1208 (Fed. Cir. 1992) (in reference to claim construction, “Other players in the marketplace are entitled to rely on the record made in the Patent Office in determining the meaning and scope of the patent”); Mentor Corp. v. Coloplast, Inc., 998 F.2d 992, 996 (Fed. Cir. 1993) (discussing notice in the context of a broadening reissue patent, “[i]t is precisely because the patentee amended his claims to overcome prior art that a member of the public is entitled to occupy the space abandoned by the patent applicant. Thus, the reissue statute cannot be construed in such a way that competitors, properly relying on prosecution history, become patent infringers when they do so. In this case, Mentor narrowed its claims for the purpose of obtaining allowance in the original prosecution and it is now precluded from recapturing what it earlier conceded.”) (emphasis added).
history does not serve merely to protect specific competitors from being misled. Such a limited purpose suggests that prosecution history estoppel requires detrimental reliance on the part of the defendant, a requirement not supported in the case law.\(^{46}\) Instead, the prosecution history, along with the specification and claims, provides notice about patent scope to the entire community of competitors. As commentators have noted in recent years, there is a complex relationship between claim scope awarded and the ability of the patent system to encourage invention and innovation, especially in "science-based" arts such as biotechnology.\(^{47}\) Claim scope that does not reasonably correlate with the inventor's contribution can result in decreased technological development. This may occur when workers who advance the art by improving on and designing around patented inventions decline to do so because they fear repercussions for infringing the patented invention.\(^{48}\)

The "claim scope" that affects a competitor's decision about whether to market a product similar to the patented device, or to conduct research aimed at creating an improvement of a patented invention, is not only a function of the scope of the court's interpretation.\(^{49}\) Claim scope also encompasses what is understood or estimated by competitors before litigation arises. In attempting to estimate the reach of a patent, a competitor will refer, just as a court will, to the prosecution history.\(^{50}\) The anticipated legal effect of the prosecution

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\(^{46}\) See Casey, supra note 43, at 393-94 (asserting that defendants in patent cases seldom prove that they suffered injury by relying on the prosecution history). See also CHISUM, supra note 13, § 18.05[1] (distinction between prosecution history estoppel and estoppel as used in other legal contexts is that only the latter requires actual detrimental reliance by the person seeking to establish the estoppel); Kurt James, Patent Claims and Prosecution History Estoppel in the Federal Circuit, 53 Mo. L. REV. 497, 514 (1988) (reliance by defendants in patent case is unlikely).


\(^{48}\) See, e.g., Hilton Davis, 62 F.3d at 1529-1536 (Newman, J., concurring).

\(^{49}\) I refer here to both the court's determination of the literal scope of the claims and the scope under the doctrine of equivalents.

\(^{50}\) One might question whether the prosecution history is, in fact, studied by competitors as part of a process of making business decisions, or whether the notice theory assumes unrealistic behavior on the part of competitors. Joseph E. Dvorak, in an often-quoted article, argued that "[i]t is particularly difficult to picture the large number of alleged infringers sifting through the patent office files and being mislead by applicants' statements contained in those records." Joseph E. Dvorak, That Perplexing Problem - the Doctrine of File Wrapper Estoppel, 50 J. PAT. OFF. SOC'Y 143, 144 (1968). However, at least in the context of arts in which the parties are sophisticated in patent matters and the expenditures are large (e.g., the biotech-
history will thus influence decisions about whether to develop, or enter the market with, a competing product.

Consistent with its reliance on the notice rationale, the Federal Circuit will find estoppel where the surrender of claim scope would be readily apparent to a competitor, but is more cautious when the fact or scope of a surrender is unclear. Thus, "unmistakable assertions" regarding claim language are sufficient to estop while claim amendments that would not be understood by a reasonable competitor as surrendering claim scope will not necessarily result in estoppel. Similarly, the addition of clarifying language intended merely to better define an invention will not necessarily estop. Note that in determining whether a reasonable competitor could infer that the applicant has made a surrender of claim scope, it is the apparent intention of the applicant to surrender scope, as revealed in the prosecution history, that is relevant, rather than any actual subjective intention of the applicant at the time the amendment was made.

To be sure, when the estopping effect of an amendment is disputed the court does not necessarily frame its discussion in terms of notice. One list of what the court will consider in assessing the estopping effect of an amendment includes: the content of any prior art documents cited by the examiner, comments about the amendment made by the applicant, and the role of the amendment in inducing the examiner to allow the claims. Each of these factors allows the court to identify claim amendments that would be understood by competitors as an indication that an intentional surrender of claim scope has taken place.

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52. See, e.g., Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., Ltd., 72 F.3d 857, 864 (Fed. Cir. 1995) (finding no reversible error in trial court's holding of no estoppel and observing that "[t]he reason for the addition was not stated in the prosecution history, was vigorously disputed at trial, and was not at all clear to the trial judge, who called the addition 'a mystery'").

53. Hi-Life Prods., Inc. v. American Nat'l Water-Mattress Corp., 842 F.2d 323 (Fed. Cir. 1988); Moeller v. Ionetics, Inc., 794 F.2d 653 (Fed. Cir. 1986). Interestingly, in both Hi-Life and Moeller, the allegedly estopping action was the applicant's acquiescence to an examiner's amendment.

54. For example, evidence that is not a part of the prosecution history (e.g., notes from an internal business meeting) indicating that the applicant intended not to narrow a claim would not be considered in determining estoppel.

55. Festo, 72 F.3d at 864.
been made. The content of the prior art provides evidence indicative of the applicant’s motivation to surrender scope; comments by the applicant provide direct evidence regarding an intention to surrender scope; and the examiner’s understanding of the import of the amendment is indicative of what a reasonable competitor’s understanding would be.\textsuperscript{56}

Amendments made to claims in response to enablement rejections will often provide notice of a surrender of claim scope that is equal in clarity to the notice provided by amendments made to overcome art rejections. Imagine, for example, that a novel device for sensing light is invented. A broad claim to the invention might recite, \textit{inter alia}, “a sensor activated by light.” If the examiner cites prior art that renders a sensor activated by ultraviolet light obvious, the claim might subsequently be limited to recite “a sensor activated by visible light.” In this case, a competitor would be on notice that the claim does not read on an ultraviolet-activated sensor, and the patentee would be estopped from asserting in court that an apparatus activated by ultraviolet light is an equivalent to one activated by visible light.

The same notice regarding claim scope would be provided to the competitor if the claim amendment had been motivated, not by an obviousness rejection, but by an examiner’s assertion that a sensor activated by ultraviolet light was not enabled by the specification. If the claim is allowed and a patent issued, a competitor might reasonably conclude that ultraviolet activation is not encompassed by the claim, either literally or under the doctrine of equivalents. Using the notice provided by an applicant’s action as the criterion for finding estoppel, there is no basis for excluding \textit{per se} amendments responsive to enablement rejections from the set of potentially estopping actions.\textsuperscript{57}

\textsuperscript{56} Consideration of the final element of the Festo list, the role of the amendment in inducing the examiner to allow claims, is illustrated in several cases. \textit{See also} Gussin v. Nintendo of Am., Inc., 62 F.3d 1433 (Fed. Cir. 1995) (unpublished) (finding estoppel in light of fact that applicant’s arguments provided the motivation for examiner’s allowance of claims); Great Northern Corp., v. Davis Core & Pad Co., Inc., 782 F.2d 159, 166 (Fed. Cir. 1986) (finding of no estoppel motivated, in part, by determination that the examiner’s rejection was improper); Zenith Lab., Inc. v. Bristol-Myers Squibb Co., 19 F.3d 1418, 1424 (Fed. Cir. 1994) (no estoppel where examiner did not depend on applicant’s statements in allowing patent to issue); Hoganas AB v. Dresser Indus., Inc., 9 F.3d 948, 953 (Fed. Cir. 1993) (finding no estoppel and noting that in light of the facts, a reasonable competitor “would not be justified in concluding the examiner relied on this distinction [between the claimed invention and the prior art device] in allowing the claims . . . .”).

\textsuperscript{57} Other commentators have also concluded, generally with little discussion, that enablement estoppel is appropriate. Carole E. Barrett, \textit{supra} note 12, would limit both art and
The degree to which a prosecution history provides a competitor with "notice" depends, of course, on the competitor's ability to interpret the prosecution history with confidence and anticipate its effect in court. There is an obvious element of circularity in assessing the notice-giving effect of arguments and amendments in a prosecution history: if the courts signal that certain actions or statements (e.g., those having to do with enablement) do not have an estopping effect, competitors will interpret the prosecution history accordingly. Absent, however, signals from the court that in a given situation estoppel exists per se (or does not exist), the notice rationale depends on the reasonable inferences a competitor can make at the time of infringement. Because the estopping effect of an amendment is not absolute, but can vary along a continuum in a fact-dependent manner, Section IV of this paper argues that estoppel is warranted only when the extent, as well as the presence, of the surrender can be determined by the competitor.

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58. See discussion infra Part IV.
B. **Insuring Adequate Examination**

Although notice to competitors is the rationale most clearly articulated by the Federal Circuit, it is not the only basis for prosecution history estoppel. A second rationale is rooted in the process by which patents are obtained: examination of an application before the Patent and Trademark Office. In making a determination as to patentability, the PTO acts to guarantee both that the claims are limited to patentable subject matter and that the scope of protection is clearly defined and commensurate with the inventor's contribution to the art.

An applicant faced with rejected claims has choices about how to proceed. She may limit the claims by amendment (or cancellation) or, alternatively, avail herself of the opportunity to overcome the rejection by appealing to the Board of Patent Appeals Interferences and subsequently to Federal District Court and/or the Federal Circuit.

An applicant who, rather than appealing, acquiesces to the examiner's judgment by amending a claim has removed subject matter from the examination before the PTO. Courts have frequently emphasized the requirement for a reasonable correspondence between subject matter placed before the PTO and the scope later upheld in court: prosecution history estoppel serves to insure that the claim scope awarded a patentee in court does not include matter removed from examination, but, rather, corresponds to what was presented for examination before the PTO.

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59. The claimed invention must fall into a statutorily patentable category and be novel, useful, and nonobvious. 35 U.S.C. §§ 101-103 (1982).

60. The second paragraph of § 112 requires that the claims particularly point out and distinctly claim subject matter of the invention. 35 U.S.C. § 112 (1988).

61. The invention must be novel and nonobvious. 35 U.S.C. §§ 102, 103 (1988). Moreover, a patent will be awarded only for those claims that are enabled by the specification. 35 U.S.C. § 112 (1988). Claims not meeting these requirements are rejected as unpatentable.


65. See, e.g., Autogiro Co. of Am. v. United States, 384 F.2d 391, 399 (Ct. Cl. 1967) ("When the application is rejected, the applicant will insert limitations and restrictions for the purpose of inducing the Patent Office to grant his patent. When the patent is issued, the patentee cannot disclaim these alterations and seek . . . broadly before the courts."). Cf. Judge Hand's observation that "[i]f the rejection [by the examiner] is wrong, the applicant has remedies both in the Patent Office and the courts: remedies which the cancellation of the rejected claim necessarily surrenders." Musher Found. v. Alba Trading Co., 150 F.2d 885, 888 (2d Cir. 1945).
In *Genentech, Inc. v. Wellcome Foundation Ltd.*, the Federal Circuit noted that the requirement that claim scope comport with the results of a full examination applies equally whether the alleged infringement is literal or by equivalents. The claims at issue in *Genentech* were directed to a “human tissue plasminogen activator,” which the court found necessary to define as a first step to determining infringement. The court discerned four different possible definitions in the patent specification and declared that, in deciding among them, it should avoid “those definitions upon which the PTO could not reasonably have relied when it issued the patent.” The court went on to declare that an applicant should not be permitted to submit ambiguously worded claims to the PTO in the hope that they will be construed narrowly during prosecution, and then argue after allowance that they should be construed more broadly. In making this point, the court made no distinction between literal claim scope and scope obtained under the doctrine of equivalents, stating:

An applicant should not be able deliberately to narrow the scope of examination to avoid during prosecution scrutiny by the PTO of subject matter with the objective of more quickly obtaining a patent (or avoiding the risk of an estoppel), and then obtain in court, either literally or under the doctrine of equivalents, a scope of protection which encompasses that subject matter.

If there was no prohibition on narrowing claims during examination and subsequently “expanding” them (either by expansive claim construction or under the doctrine of equivalents) during litigation, the result would be a disparity between the actual claim scope awarded by the PTO following examination and the effective claim scope from which the patentee could benefit. Such disparity would reduce efforts to design around or improve patented inventions. Competitors would be reluctant to develop similar products or im-

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66. 29 F.3d 1555 (Fed. Cir. 1994).
67. *Id.* at 1564.
68. *Id.*
69. *Id.* In a footnote later in the decision, the court reiterated this point and connected it to the issue of notice. The court wrote:

Another problem faced by plaintiffs/appellees is that the doctrine of equivalents is not available for the attainment in court of a scope of protection which encompasses subject matter deliberately removed from examination during prosecution through narrow claiming. This is a reflection of the rule enunciated in *Perkin-Elmer Corp. v. Westinghouse Elec. Corp.*, that it is impermissible to erase under the doctrine of equivalents "meaningful" limitations of the claim on which the public is entitled to rely in avoiding infringement."

*Id.* at 1568 n.41 (citations omitted).
prove on existing patented inventions if they believed that the scope of the existing patent claims might be enlarged to encompass the result of their own efforts.

In Genentech, the scope of the examination was narrow, not because broad claims were narrowed by amendment during prosecution, but because narrowly (or ambiguously) worded claims were submitted to the PTO. However, the rule that an applicant is not entitled to claim scope encompassing matter that, through intentional actions on the part of the applicant, has not been examined and allowed by the PTO does not depend on the point in prosecution at which the claims are narrowed. Narrow drafting of the original claims and subsequent narrowing by amendment both remove matter from examination and ultimate resolution. Moreover, when the narrow scope is due to amendment, there is no difference between amendments responsive to art-rejections and those responsive to enablement-rejections: a limitation added to overcome an enablement rejection removes subject matter from the examination process as effectively as an amendment added to overcome a prior art rejection. Just as for notice, under the “adequate examination” rationale, there is no basis for excluding enablement amendments from the catalogue of potentially estopping actions.

Under the “adequate examination” rationale, the doctrine of prosecution history estoppel should apply only to subject matter that has been removed from examination by the applicant. This raises the issue of how to determine exactly what that subject matter includes. Professor Chisum’s view is that the effect of estoppel should only be commensurate in scope with the construction of the claim as mutually understood by the examiner and the applicant, as revealed by the prosecution history. A better measure of what has or has not been removed from examination would be the understanding that one of ordinary skill in the art would have in light of the prosecution history. Statute and case law regarding novelty, obviousness and enable-

70. A different case arises when matter has not been examined, not because it was excluded from examination by the applicant, but because of post-filing developments in the art. See infra note 90.

71. CHISUM, supra note 13, § 18.05[1]. Professor Chisum has argued that the best rationale for prosecution history estoppel is based on the circumvention of the “administrative procedures and expertise of the [Patent & Trademark] Office” that occurs when an applicant adopts a narrow definition before the PTO and relies upon a broader definition in an infringement suit. Id.

72. Invalidity for anticipation under 35 U.S.C. 102 requires that there be “no difference between the claimed invention and the reference disclosure, as viewed by a person of ordinary skill in the field of the invention.” Scripps Clinic & Research Found. v. Genentech, Inc., 927
ment require that the examiner (and the courts) use the perspective of a hypothetical person of ordinary skill in determining patentability, and consistency requires that this perspective, rather than those views that the applicant and examiner happen to share, should govern estoppel as well. Thus, under the "adequate examination" rationale, an applicant should be estopped from reaching equivalents that one of skill would understand, based on the prosecution history, to have been removed by the applicant from examination. According to this rational, the removal of subject matter from examination to avoid an enablement rejection has the same effect on the scope of examination as removal to avoid an art rejection, and should logically have the same effect in relation to prosecution history estoppel.

Although they are formulated differently, the "adequate examination" rationale and the "notice" rationale are related. As recognized by the Federal Circuit, a "reasonable competitor's" interpretation of the prosecution history is based on the reading that would be made by one of ordinary skill in the art. The actions that provide a competitor with notice that the scope of a claim does not extend to certain subject matter also inform a person of ordinary skill that the subject matter has been withdrawn from examination. In short, under either the "adequate examination" or "notice" rationales, a finding of prosecution history estoppel will be based on the interpretation by one of skill in the art as to what was presented for, and removed from, examination. Moreover, either rational can be applied to amendments made to overcome an enablement rejection as well as to

F.2d 1565, 1576 (Fed. Cir. 1991).

73. 35 U.S.C.A. § 103(a) (West Supp. 1996). The statute requires that, to be patentable, an invention must not have been obvious to "a person having ordinary skill in the art to which the subject matter [of the invention] pertains."

74. 35 U.S.C. § 112 (1988). The statute requires that the specification "enable any person skilled in the art to which it pertains...

75. As a practical matter it would be expected that the mutually held construction of the examiner and applicant would be strong evidence of what one of skill would believe. This reasoning is in accord with dicta in Hoganas AB v. Dresser Indus., Inc., 9 F.3d 948, 952 n.15 (Fed. Cir. 1993) ("Ordinarily, the test for determining the meaning of a claim term is from the vantage point of one skilled in the art. This test would seem equally appropriate for determining what subject matter was relinquished in the context of prosecution history estoppel"). See also Modine Mfg. Co. v. United States Int'l Trade Comm'n, 75 F.3d 1545, 1547 (Fed. Cir. 1996) (standard for determining whether particular subject matter was relinquished "is based on the reasonable reading, by a person of skill in the field of the invention, of the entire prosecution history").

76. Hoganas AB v. Dresser Indus., Inc., 9 F.3d 948, 952 n.15 (Fed. Cir. 1993) (vantage point for determining what subject matter was relinquished is that of one reasonably skilled in the art viewing the question from the perspective of a competitor in the marketplace).

77. See also supra note 69 and accompanying text.
amendments made to overcome art-based rejections.

IV. THE EXTENT OF ESTOPPEL

The Federal Circuit has emphasized that the existence of an estopping amendment or argument does not preclude a patent holder from invoking the doctrine of equivalents. The fact that claims are narrowed during prosecution does not necessarily prevent a patentee from "recapturing some of what was originally claimed." Instead, "a close examination [of the prosecution history] must be made as to, not only what was surrendered, but also the reasons for such a surrender." Deciding what part, if any, of the surrendered claim scope can be recaptured as an equivalent—that is, the "extent" of the estoppel—is as critical as whether an amendment has any estopping effect at all. The extent of estoppel, as well as its existence, depends heavily on the facts and circumstances of the specific case at issue.

78. Loctite Corp. v. Ultrasel, Ltd., 781 F.2d 861, 871, (Fed. Cir. 1985) (citing Bayer Aktiengesellschaft v. Dupar Int'l Research, 738 F.2d 1237, 1243 (Fed. Cir. 1984)).

79. Loctite Corp., 781 F.2d at 871. The view of the Federal Circuit in this regard has not always been clear. Kurt James, supra note 46, has argued that two distinct lines of cases can be distinguished in Federal Circuit decisions. According to his analysis, a "broad application" of prosecution history estoppel is found in Kinzenbaw v. Deere & Co., 741 F.2d 383 (Fed. Cir. 1984), and cases following it, and a "narrow application" is found in Hughes Aircraft Co. v. United States, 717 F.2d 1351 (Fed. Cir. 1983) and its progeny. In the "broad application" cases, the court, upon finding that estopping acts or amendments are present, declines to investigate the circumstances of the amendment in order to determine the scope of estoppel. In "narrow application" the court is more fact sensitive, and will look to the prior art, prosecution history, and other facts in order to determine the extent of the estoppel (i.e., whether any of the surrendered matter might be "recaptured").

The conflict identified by Mr. James has been resolved in favor of the "broad" Hughes standard. See, e.g., Hilton Davis Chem. Co. v. Warner-Jenkinson Co., Inc., 62 F.3d 1512 (Fed. Cir. 1995) (when prosecution history estoppel is invoked examination must be made of the reason for the surrender). In this light, the Kinzenbaw has a more limited interpretation, signifying that when the primary distinction between the claimed invention and the asserted equivalent is subject matter that was clearly surrendered, the range of equivalents will be very narrow. See infra note 89 and corresponding text. See also Texas Instruments Inc. v. United States Int'l Trade Comm'n, 988 F.2d 1165, 1174 (Fed. Cir. 1993) (noting that a determination of estoppel requires examination of the prosecution history and citing Kinzenbaw for the proposition that "unmistakable assertions" may result in estoppel).

For an argument that the "narrow/broad" dispute remains unresolved, see Paul J. Otterstedt, Unwrapping File Wrapper Estoppel in the Federal Circuit: A New Economic Policy Approach, 67 ST. JOHN'S L. REV. 405 (1993). Otterstedt argues that the "Kinzenbaw" approach has not been abandoned. As examples of recent cases using a "broad application" Otterstedt cites Lemelson v. General Mills, Inc., 968 F.2d 1202 (Fed. Cir. 1992), which is more properly viewed as a claim construction case, and Charles Greiner & Co., Inc., v. Mari-Med Mfg., Inc., 962 F.2d 1031 (Fed. Cir. 1992). In Charles Greiner, the issue of estoppel appears to have been irrelevant: the accused device was substantially changed compared to the claimed invention. Accordingly, even without considering the prosecution history, no infringement under the doctrine of equivalents could have been found.
The extent of estoppel found by the Federal Circuit in a particular case is often an instrument for reaching an equitable result rather than the result of application of a clear rule, and the criteria used by the court to determine the effect of an estopping amendment have not been set forth in any clear or systematic way. The Federal Circuit's well-known observation that "depending on the nature and purpose of an amendment, it may have a limiting effect from great to small to zero," for example, tells little about what the relationship is between the "nature and purpose" of an amendment and its limiting effect.

The guidance that can be found in the case law regarding the determination of the extent of estoppel is limited almost exclusively to cases in which the applicant has responded to an art rejection. In cases of art estoppel, reference to the prior art cited by the examiner is useful in determining the scope of estoppel. Although the estopping effect of an amendment is not limited to exactly what was required to distinguish the prior art, the prior art documents cited by an examiner making an art rejection serve as important extrinsic evidence that an intentional surrender of claim scope has been made and provide clues as to the extent of the surrender. No evidence exactly analogous to the prior art is available for enablement rejections.

In considering enablement estoppel we should expect the basis of determinations regarding the extent of estoppel to be related to the rationales that have been adopted by the Federal Circuit for finding estoppel generally: the provision of notice to competitors and the requirement that an applicant not recapture matter intentionally re-

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82. LaBounty Mfg., Inc. v. United States Int'l Trade Comm'n, 867 F.2d 1572 (Fed. Cir. 1989).

83. Southwall Techs., Inc. v. Cardinal IG Co., 54 F.3d 1570, 1581 (Fed. Cir. 1995).

84. For example, consider an applicant who, in order to distinguish his invention from a prior art device with handles on the top, adds a limitation specifying that the claimed device has "handles on the side." He would then be estopped from asserting that top-handles are an equivalent of side-handles. His addition of a limitation concerning handles would not, however, estop him from asserting that indentations useful for lifting are the equivalent of handles. Cf. Great Northern Corp. v. Davis Core & Pad Co., Inc., 782 F.2d 159 (Fed. Cir. 1986) (limitation added to distinguish "recesses located at side" from "recesses located at bottom" do not result in estoppel as to definition of "recess"); also noting that the examiner's rejection was erroneously based on hindsight reconstruction.) See also Great Northern Corp. v. Davis Core & Pad Co., Inc., 1985 WL 2467 *8 (N.D. Georgia 1985) (trial court decision).
moved from examination. According to these rationales, enablement estoppel should be found when the prosecution history would give an objective, informed observer (whether characterized as a reasonable competitor or as one of ordinary skill in the art) notice that the claims do not reach certain subject matter, and where one of skill would understand certain subject matter to have been purposefully removed from examination. In a case in which an objective observer could not discern, based on the prosecution history, what was surrendered, there will be no basis for estoppel. Thus, where an amendment is made to overcome an enablement rejection, the application of prosecution history estoppel should depend on whether the disputed subject matter has clearly been disclaimed by the applicant.

A. Surrender of Determinable Scope

In thinking about enablement estoppel it is useful to differentiate between two types of claim amendments. The first is an amendment that removes a specific element from examination. In such a case, the extent of the surrender will be determinable from the prosecution history. The second type of amendment does not remove (or add) a specific element, but instead changes the claim in a way that does not allow what was surrendered to be specifically determined from the prosecution history.

When the amendment specifically surrenders a claim element that constitutes the distinction between the patented invention and the alleged equivalent, enablement estoppel is appropriate. Consider, for example, the light-activated sensor discussed supra in Part III.a. In that example, a claim to a “sensor activated by light” was narrowed to “a sensor activated by visible light” in order to specifically remove ultraviolet light from the claim. It makes no difference in this case whether the amendment was motivated by an enablement rejection (asserting that a ultraviolet-activated sensor was not enabled by the specification) or an art rejection (asserting that the prior art rendered a ultraviolet-activated sensor obvious). A competitor who manufactures a sensor activated by ultraviolet light, but not visible light, should be able to rely on prosecution history estoppel to avoid a finding of infringement under the doctrine of equivalents. The element removed by amendment (ultraviolet activation) is the focus of the difference between the invention as originally claimed (a sensor

85. These rationales are discussed supra Part III.
86. See supra note 74 and accompanying text.
87. See supra pp. 121-122.
activated by light) and the asserted equivalent (a sensor activated by visible light). The clear surrender of a discrete element provides the elements required for estoppel — notice and removal of matter from examination. In contrast, the patent holder would not be estopped from asserting infringement against a competitor who markets a sensor activated by infrared light. The amendment did not specifically surrender infrared light (which may or may not be equivalent to visible light), but was made to address prior art or enablement issues related to ultraviolet light.

The Federal Circuit has emphasized that, when what distinguishes the claimed device from the allegedly infringing product is precisely the element that the applicant surrendered to overcome a rejection, estoppel will be found. For example, in Mannesmann Demag Corp. v. Engineered Metal Products Co., Inc.\textsuperscript{88} the court found that the patentee was estopped from claiming that a competitor’s smelting furnace vessel was equivalent to the patentee’s vessel. During prosecution, the patentee avoided an obviousness rejection by amending the broad claim to specify that coils that formed a part of the vessel were in “a contacting relation.” In contrast, the competitor’s coils did not touch each other. The court observed that although the patentee was not deprived of all equivalents to the claimed invention, “the enlarged claim interpretation that [the patentee] seeks to apply to the [competitor’s product] falls squarely within the claim scope that [the patentee] relinquished to overcome the cited references.”\textsuperscript{89} An amendment that is unambiguous and directed to a specific element provides notice to competitors of the surrender of that element and removes it from examination. The range of equivalents will be very narrow.

It is important to note that the estoppel resulting from an enablement rejection does not result because the doctrine of equivalents

\textsuperscript{88} 793 F.2d 1279 (Fed. Cir. 1986).

\textsuperscript{89} Id. at 48-49. See also Kinzenbaw v. Deere & Co., 741 F.2d 383 (Fed. Cir. 1984) (noting that the accused device utilized “a characteristic that the inventor had specifically eliminated from his claim” and noting that the alleged infringer “adopted the very element that [the inventor] had eliminated for the stated purpose of avoiding the examiner’s rejection and obtaining the patent.”); Haynes Int’l Inc. v. Jessop Steel Co., 8 F.3d 1573 (Fed. Cir. 1993) (estoppel supported by the fact that the element distinguishing the claimed invention and the allegedly infringing product was also “the principle distinction between the claimed subject matter and the prior art, and thus was the primary area of dialogue between [the applicant] and the PTO.”).
requires equivalents to be enabled at the time of filing. The estoppel arises instead because the applicant has acquiesced to the removal from examination of a specific, presently conceivable embodiment and this removal would be clearly apparent to a competitor reading the prosecution history. The applicant, having been unable to convince the examiner that the subject matter encompassed by the original claim was enabled, and having decided not to appeal the examiner's decision, would not then be able to regain the original claim scope in court.

B. Surrender of Indeterminable Scope

In contrast to the situation in which a specific element is removed from prosecution, when an enablement rejection is overcome by an amendment that reduces the scope of a claim by degree, it may not be possible to determine from the prosecution history what was surrendered.

In many cases in which a genus claim, for example, is narrowed to a specific species, the fact that some claim scope has been surrendered will be apparent, but the boundaries or extent of the surrender will not be determinable from the prosecution history. In such a case, enablement estoppel should not arise. The blood-diluent example discussed in Part II.b is an illustration of an amendment that narrows a genus to a specific species. In that example, the scope of the

90. Hughes Aircraft Co. v. United States, 717 F.2d 1351 (Fed. Cir. 1983), made it clear that equivalents are not limited to embodiments enabled at the time of filing. In Hughes, a claim encompassing a ground-controlled synchronous communications satellite was held to reach, under the doctrine of equivalents, a similar communications satellite that was controlled by an on-board computer. Computers compact enough to be located in a satellite were not known at the time the patent at issue was filed. Under Hughes, a future-developed technology not known to the patent applicant can be encompassed in the patent claims. As the court stated, "[an applicant] is not required to predict all future developments which enable the practice of his invention in substantially the same way." Id. at 481.

Prosecution history estoppel was considered by the Hughes court after the defendant argued that, because the applicant had made amendments to the broad claims during prosecution, the patent holder was precluded altogether from invoking the doctrine of equivalents. This position, which had received some support in other circuits, was soundly rejected by the court. Instead the court adopted the present position that the particular facts surrounding an amendment must be considered. The court pointed out that the Hughes inventor "did not, of course, surrender subject matter related to employment of an on-board computer" and so there could be no estoppel reaching the infringing satellite having an on-board computer. Id. Hughes can thus be distinguished from the case in which an applicant surrenders a known structure or process to overcome an examiner's amendment, such as the surrender of ultraviolet light as an activating source in the example given in the text. See also In re Hogan, 559 F.2d 595 (C.C.P.A. 1977) (applicants cannot disclose what they do not know).

91. See supra text accompanying notes 37-41.
applicant's claim was narrowed from a genus containing at least seventy species (metallic phosphates) to a single species (sodium phosphate). The applicant acquiesced to this limitation and forewent the opportunity to rebut or appeal the examiner's position. Nonetheless the bounds of the surrender in this instance are unclear. It is unlikely that either the applicant or the examiner viewed the amendment as having the force of completely relinquishing the applicant's rights to all of the roughly sixty-nine species not literally claimed; nor would a reasonable competitor conclude from this amendment that the remaining sixty-nine were disclaimed. The amendment does not provide notice to a competitor, for example, that an equivalent blood-diluent containing potassium phosphate was disclaimed by the patentee.

When genus-type claims are amended in response to an enablement rejection there is often nothing in the amendment or the record that gives clues about the extent of the applicant's surrender: a competitor often will not be able to discern from the amendment what she may make, sell, or use without infringing the patent.

In contrast to amendments made to overcome a novelty or obviousness rejection, when an amendment is prompted by an enablement rejection no prior art documents are available to provide additional information regarding the scope of the applicant's surrender. The narrowing of a not-enabled genus provides notice that something has been surrendered, but when the extent of that "something" cannot be readily determined, the "notice" will not inform a competitor's decision making and will, in effect, be no notice at all.

The "adequate examination" rationale of estoppel does not provide any better justification for an estopping effect than does the

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93. An example of a court referring to the prior art is found in Hilton Davis Chem. Co. v. Warner-Jenkinson Co., Inc., 62 F.3d 1512 (Fed. Cir. 1995). There the applicant had added a limitation reciting that a claimed purification process is carried out "at a pH from approximately 6.0 to 9.0." Id. at 1525. The Federal Circuit noted that this limitation was added to overcome an obviousness rejection based in part on prior art that taught a similar process using a pH above 9. The court concluded that, based on the reason for the surrender, the amendment "surrendered pHs above 9, but does not bar [the plaintiff] from asserting equivalency to a process . . . operating sometimes at a pH below 6." Id. Judge Plager, in dissent, pointed out that it appeared that the lower limit was also intentional because at pHs below 6.0 there would be a "tremendous foaming problem." Id. at 1542 (Plager, J., dissenting). It appears that Judge Plager based his conclusion on testimony given at trial rather than the file history. Id.
"notice" rationale when the surrender is not of a specific, determinable, element. The removal of subject matter from examination that results when a genus is narrowed, for example, is not analogous to the removal that occurs when a specific element is added or removed from a claim. Consider the blood-diluent example once more. One reading of the example is that the applicant, by amending the claim, removed sixty-nine metallic phosphates from prosecution. But such a reading would misconceive the nature of a genus claim. A genus, as considered during examination, is not the same as the sum of its species. The narrowing of a genus that includes seventy species is quite different, for example, from the situation in which a Markush group of seventy species is narrowed because an examiner asserts that sixty-nine of the species are not enabled. When the genus claim is narrowed, in contrast to the amendment narrowing the Markush group, neither the applicant nor the examiner has made a determination (or admission) that any particular species is not enabled. More often, the issue is whether a sufficient fraction of the species in the genus have been enabled. Frequently the content of the genus is not exactly defined. It is probably accurate to characterize the applicant’s surrender in narrowing a genus as a surrender of nothing more than the right to sue under a theory of literal infringement rather than under the doctrine of equivalents.

Although the discussion above has been framed in terms of "genus claims," it is important to keep in mind that the distinction is not between genus and non-genus claims, but between amendments whose extent can be readily determined (and which would apparent to competitors) and those that cannot. For example, where the prosecution history reveals that certain species or subgenera (e.g., alkaline-earth metal-phosphates) were the focus of the enablement rejection and subsequent amendment, enablement estoppel could reach those species or subgenera.

94. See supra Part II.B.
95. For a description of Markush claims, see CHISUM, supra note 13, § 8.06[2].
96. That situation would be comparable in nature, though not scale, to the examples discussed supra Part IV.B., of determinable surrenders.
97. A claim may be invalid if a significant number of inoperative species are claimed, such that one of skill would be forced to experiment unduly in order to identify operative species and practice the invention. Atlas Powder Co. v. E.I. Du Pont de Nemours & Co., 750 F.2d 1569, 1576 (Fed. Cir. 1984).
When an enablement rejection leads to a surrender of indeterminable scope, no notice is provided by the amendment and specific species are not withdrawn from examination. For these reasons, no enablement estoppel should result from such amendments. However, the position that enablement estoppel should not be applied when the bounds of the estoppel would not be clear, does not suggest that "enablement estoppel" should not be acknowledged in appropriate situations. When the scope of estoppel is clear, the argument for enablement estoppel remains persuasive.

V. CONCLUSION.

No doctrinal or policy barriers preclude a finding of prosecution history estoppel based on amendments made to overcome enablement rejections. However, "enablement estoppel" should be found only in cases in which extent of the surrender of claim scope is readily apparent from the prosecution history. In general, an amendment in which the surrendered matter is not discrete, such as amendments that narrow a genus to a species, will not meet this requirement. However, in cases in which the amendment removes specific subject matter from examination and provides notice to competitors that a surrender of specific subject matter has taken place, the application of estoppel is warranted.

Enablement estoppel, applied appropriately, would result in a closer correspondence between the inventor's contribution to the art — as revealed by the specification — and the claim scope the inventor can assert through the doctrine of equivalents. Such "closer correspondence" is consistent with the axiom of the patent system that an inventor should receive a patent for what she invents and no more. By applying enablement estoppel only when the import and extent of the applicant's surrender is clear, it should be possible to provide competitors with greater understanding of what activities they may engage in without incurring liability for infringement and,

98. To the extent that enablement estoppel would not be available in certain cases to prevent an applicant from claiming an unenabled, unexamined embodiment under the doctrine of equivalents, there may be alternative ways to reign in the application of the doctrine of equivalents. A requirement that the doctrine of equivalents extend only to embodiments enabled by the patent specification, as suggested by Handley, supra note 41, is one possibility.
at the same time, avoid unwise limits on a court’s ability to use the doctrine of equivalents to achieve an equitable result in specific cases. 99

This Article was completed in the Spring of 1996 and was in press at the time of the U.S. Supreme Court’s decision in Hilton Davis Chem. Co. v. Warner-Jenkinson Co., Inc., 65 U.S.L.W. 4162 (1997). The opinion in that case includes comments on prosecution history estoppel that require necessarily brief comment here.

Writing for the Court, Justice Thomas emphasizes that prosecution history estoppel is historically based on amendments made to avoid prior art “or otherwise to address a specific concern . . . that arguably would have rendered the claimed subject matter unpatentable.” Id. at 4165. The Court also suggests that an important consideration in determining when estoppel should be found is “the reasoning behind the Patent Office’s insistence upon a change in the claims.” Id. at 4166. Thus, “if the PTO has been requesting changes in claim language without the intent to limit equivalents or, indeed, with the expectation that language it required would in many cases allow for a range of equivalents, we should be extremely reluctant to upset the basic assumptions of the PTO . . .” Id. at 4166.

The Court’s dictum in Hilton Davis must be read as reluctance to find estoppel when amendments are made for reasons other than to avoid prior art (e.g., enablement rejections). However, nothing in the language of the decision appears to preclude a finding of enablement estoppel in all circumstances, e.g., when it is clear that changes required by the Patent Office were understood to limit the scope of equivalents.