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PATENT CLAIMS AND PROSECUTION HISTORY ESTOPPEL IN THE FEDERAL CIRCUIT

I. INTRODUCTION

When a patent is granted, it includes claims to certain subject matter which define the scope of the patentee's invention and hence the scope of the monopoly granted to the patentee. The patent's claims are the product of a give-and-take process. The applicant submits his claims to the scrutiny of the patent examiner. Initially, this examiner is likely to reject the claims or to impose additional requirements on the applicant. Once approved, the claims are the product of the exercise of specialized knowledge by the applicant and the examiner. If the process works correctly, the claims are the best expression of the applicant's invention. In large measure, the claims distinguish the patentee's invention from those already in the public domain or incorporated in a previously issued patent. The claims define the boundaries of the patentee's monopoly, and those who violate those boundaries are subject to an action for infringement.

Given that the patent's claims define the patentee's monopoly rights to the patent, one would expect an infringement action to consist of a comparison of all or part of the allegedly infringing device or process to the patent claims. If the language of the claims does not cover the defendant's device or process, then no infringement is found. However, despite uniform agreement as to this rule, courts have not limited the patentee's protection to the literal language of the claims. As Judge Learned Hand explained, "after all aids to interpretation have been exhausted, and the scope of the claims has been enlarged as far as the words can be stretched, on proper occasions courts make them cover more than their meaning will bear." 


2. This rule has been embraced by numerous courts. See supra note 1.

3. Royal Typewriter Co. v. Remington Rand, Inc., 168 F.2d 691, 692 (2d Cir.),

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In so stating, Judge Hand was referring to the equitable doctrine of equivalents. Before moving to an analysis of what constitutes a *proper occasion* for application of the doctrine, an understanding of its basic nature is necessary. The doctrine of equivalents provides that an accused device or process, although different from the patentee's invention as described in the claims, still may be found to infringe "if it performs substantially the same function in substantially the same way to obtain the same result."4 "The doctrine of equivalents is designed to protect inventors from unscrupulous copyists, and unanticipated equivalents."5

The doctrine has undergone a long evolution. Before the Patent Act of 1870, the common practice was to claim the invention in general terms6 after describing it in the specifications.7 The description of the invention was, as it is under the present law,8 distinguished from the claims of the invention.9 An infringement action consisted of a comparison of the patented device with the allegedly infringing device, and it was not possible for the defendant to prevent a finding of infringement by substituting "'well known equivalents.'"10 Given the lack of expert guidance as to what characteristics of the invention made it patentable, courts had considerable discretion in the infringement determination. This discretion was reduced somewhat by the enactment of the Patent Act of 1870. According to Chisum, "'[a]fter the Patent Act of 1870, the Supreme Court placed increased emphasis on the language of the claims as the measure of the exclusive rights granted by a patent.'"11 Nevertheless, the doctrine of equivalents survived this transition and certain refinements were introduced. Significantly, the range of equivalents came to depend upon "the degree of invention."12 The range of equivalents protected by the patent is largest when the patent defines a new area of inventive art (pioneer patent),13 and smallest when the patent is an improvement in an art crowded with previ-

cert. denied, 335 U.S. 825 (1948).
6. The law today requires the claims to "particularly point[] out and distinctly claim[]" what has been invented. 35 U.S.C. § 112 (1982).
9. The former serves the purpose of disclosure such that a person with skill in the art could "make and use" the invention. Id. The latter points out what it is about the invention that distinguishes it from what has come before it, makes it useful and not obvious in light of the prior art.
11. Id. § 18.02[2].
ously issued patents. Those inventions falling within an art not characterized by either extreme are entitled to "some range of equivalents."

The doctrine of equivalents carves one exception to the general rule that the claims define the scope of the invention. Another, albeit less dramatic, modification of the rule focuses on to the prosecution history of the patent claims. Every patent allowed in this country leaves in its wake a paper trail recording the prosecution history of the patent:

The prosecution history . . . of the patent consists of the entire record of proceedings in the Patent and Trademark Office. This includes all express representations made by or on behalf of the applicant to the examiner to induce a patent grant . . . . Such representations include amendments to the claims and arguments made to convince the examiner that the claimed invention meets the statutory requirements of novelty, utility and nonobviousness.

Courts use the prosecution history to interpret the claims of the patent. One aspect of this interpretive function is that it precludes the patentee from receiving a construction of the claim which, as revealed in the prosecution history, he surrendered during prosecution in order to get the claim allowed. Similarly, the patentee may not resort to the doctrine of equivalents to "resurrect subject matter surrendered during prosecution of his patent application." This limitation on the doctrine of equivalents is called prosecution history estoppel. It should be distinguished from the use of prosecution history to interpret the literal language of the patent claims. While the doctrine of prosecution history estoppel is simply stated; the simplicity of such statement belies the great difficulty in applying the doctrine to a given set of facts.

The regional circuit courts have adopted different, and often conflicting, views of prosecution history estoppel. However, since the Federal Courts Im-

19. Frequently referred to as "file wrapper estoppel."
20. "Interpreting claims in view of the prosecution history applies as a preliminary step in determining literal infringement. Prosecution history estoppel applies as a limitation to the doctrine of equivalents after the claims have been properly interpreted and no literal infringement is found." Loctite Corp. v. Ultraceal Ltd., 781 F.2d 861, 870-71 (Fed. Cir. 1985) (citation omitted). There is, then, at least a procedural difference between the two uses of prosecution history.
21. Compare New York Scaffolding Co. v. Whitney, 224 F. 452, 462 (8th Cir. 1915) with Ekco Prods. Co., v. Chicago Metallic Mfg. Co., 347 F.2d 453, 454 (7th Cir. 1965). According to Whitney, prosecution history estoppel can have practically no effect in that the patentee is allowed to claim every patentable improvement not covered by the prior art references. In Ekco, the court looks merely to see that the element of the allegedly infringed device was amended during prosecution and then bars any re-
provement Act of 1982, the Court of Appeals for the Federal Circuit has handled all appeals of patent cases from the district courts. Therefore, the discussion will focus on the fate of prosecution history estoppel in the Federal Circuit. But, given the doctrine’s long history of use in the regional circuit courts as well as the importance of Supreme Court pronouncements, cases not decided by the Federal Circuit merit discussion.

The predominance of the Federal Circuit in patent appeals gives rise to the opportunity for nationwide uniformity in patent law generally and prosecution history estoppel specifically. However, different panels of the Federal Circuit have apparently adopted divergent approaches to the application of prosecution history estoppel. One approach, represented by Kinzenbaw v. Deere & Co. and its progeny, applies prosecution history estoppel broadly to limit the use of the doctrine of equivalents. Generally, courts adopting a broad application prosecution history estoppel are unwilling to look behind the finding in the prosecution history that a claim was amended or otherwise limited to determine if the claim may yet have some range of equivalents. Other panels have applied prosecution history estoppel narrowly. This approach is adopted in Hughes Aircraft Co. v. United States and its progeny. Such courts have been willing to judge for themselves the specific limitations a particular amendment has on the available equivalents of the claim. But courts, which are in the business of deciding real cases and not writing law review articles, practically never adopt either the broad or narrow approach in a pure form. To the extent distinct approaches have developed, their legal and equitable underpinnings will be spotlighted in an effort to isolate those criteria which provide the most sound basis for the application of prosecution history estoppel. In this vein, the sections that follow will examine the broad and narrow application of prosecution history estoppel.

II. Broad Application

The leading case in the Federal Circuit which applied broad application prosecution history estoppel is Kinzenbaw v. Deere & Co. The patents alleg-
edly infringed upon in *Kinzenbaw* were for elements of a row planter. One of those elements was the apparatus for cutting a furrow in which the seeds would be placed. This apparatus consisted of two discs "substantially contact-

ing at their point of entry into the ground and diverging apart rearwardly and upwardly relative to the direction of travel, [and] a pair of depth gauge compacting wheels in face contact with the outer surfaces of said discs . . . ."\(^{27}\) The gauge wheels controlled the depth to which the discs cut. The patented configuration improved upon prior designs by placing the gauge wheels in contact with the rearward surface of the discs. This allowed the gauge wheels to scrape off any soil which might cling to the discs, and also compacted the soil in the furrow wall.\(^{28}\)

Initially, Deere's patent claim said that the gauge wheels were to extend "beyond the peripheries of the discs which they contract rearwardly of the axes of said [gauge] wheels relative to the direction of travel."\(^{29}\) The examiner rejected the claim as obvious in light of the prior art. In response to this rejection, Deere amended his claim to define more specifically the dimension of the gauge wheel. The amended claim stated that the radius of the gauge wheel was to be greater than the distance from the axes of the wheel to the rear edge of the discs and that the radius of the wheel was less than the radius of the discs.\(^{30}\) The examiner approved the claim as modified. The allegedly infringing device had a gauge wheel with a radius greater than the radius of the discs. Therefore, the court concluded that there could not be literal infringement.\(^{31}\)

Deere contended that the doctrine of equivalents applied, and the accused device was an infringement of Deere's patent despite the finding of no literal infringement. The Federal Circuit agreed with the district court that Deere could not take advantage of the doctrine of equivalents in this situation because of prosecution history estoppel.\(^{32}\) The estoppel arose because the applicant had, in response to a rejection of his original claim, amended his claim to specify that the radius of the gauge wheel was to be less than the radius of the discs. Deere argued that prosecution history estoppel should not be applied because the part of the amendment which limited the radius of the gauge wheel to a length less than the radius of the discs was not required in order to overcome prior art.\(^{33}\) The court "decline[d] to undertake the speculative inquiry whether [if the claim had not been amended to limit the radius of the gauge wheel to less than that of the discs] the examiner nevertheless would have allowed it."\(^{34}\) The court reasoned that the file containing the prosecution

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28. *Id.*
29. *Id.*
30. *Id.*
31. *Id.* at 389.
32. *Id.*
33. *Id.*
34. *Id.*
history of the patent showed that Deere had limited the claim by an amendment which had the "stated purpose" of overcoming the examiner's rejection.\textsuperscript{35} Further, the file was open to the public and thus a manufacturer would be justified in assuming that a device having gauge wheels with radii greater than that of the discs would not infringe the patent.\textsuperscript{36} The court's refusal to evaluate the necessity of the specification of the gauge wheel radius to patentability characterizes a broad application of prosecution history estoppel. The court determined that the claim had been narrowed in response to an objection by the examiner in view of prior art. In that event, the court treated the narrowed elements of the amended claim as material to its allowance.\textsuperscript{37}

There are common elements in cases which have followed the Kinzenbaw approach to prosecution history estoppel. In Kinzenbaw, the court supported its application of prosecution history estoppel by noting that the prosecution history was a public record and the manufacturers were justified in relying on the claim limitations therein.\textsuperscript{38} In Prodyne Enterprises, Inc. v. Julie Pomerantz, Inc.,\textsuperscript{39} the court refused the plaintiff's invitation to determine whether the limiting amendment was necessary to avoid the reference cited by the examiner during prosecution.\textsuperscript{40} Explaining the reasoning behind their decision, Judge Rich wrote that the plaintiff "is 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."\textsuperscript{41} A First Circuit panel, in a case prior to the establishment of the Federal Circuit, stated that it would not examine the reasons behind a limiting amendment to a claim before applying prosecution history estoppel.\textsuperscript{42} The court explained this decision by noting, "[T]o a party examining the [prosecution history] file to determine the

\textsuperscript{35} Id.
\textsuperscript{36} Id.
\textsuperscript{37} This important step in the analysis is implicit in Kinzenbaw, but the Supreme Court has stated:

The applicant having limited his claim by amendment and accepted a patent, brings himself within the rules that if the claim to a combination be restricted to specified elements, all must be regarded as material, and that limitations imposed by the inventor, especially such as were introduced into an application after it had been persistently rejected, must be strictly construed against the inventor and looked upon as disclaimers.

Smith v. Magic City Kennel Club, 282 U.S. 784, 790 (1931) (citations omitted).

\textsuperscript{38} Id.
\textsuperscript{39} Id.
\textsuperscript{40} Id. at 1583. The court cited Kinzenbaw as authority.
\textsuperscript{41} Id. (emphasis in original).
\textsuperscript{42} Borg-Warner Corp. v. Paragon Gear Works, Inc., 355 F.2d 400, 406 (1st Cir. 1965). However, the court ultimately determined that the amendment was not for the purpose of limiting the submitted claim and did not apply prosecution history estoppel. See id. How this cannot be called examining the reasons behind an amendment is difficult to understand.
true scope of what has been granted, and finding something affirmatively disclaimed, it should make no difference what was the purpose of the disclaimer.5

The common rationale in each of the these cases for a broad application of prosecution history estoppel is an estoppel argument.4 Courts refuse to use the doctrine of equivalents to expand the scope of the patent beyond that given by its literal language, because the public is allowed to rely on the limitations the inventor places on the scope of his monopoly which are part of the public record.

Another justification for the broad application of prosecution history estoppel is found in Nationwide Chemical Corp. v. Wright,46 decided by the Fifth Circuit. The court speculated that the examiner might have allowed the plaintiff's claim if it had been written more broadly. The court concluded, however, that the problem with attempting to ascertain the necessity of the amendment exactly as written "is that it would cause us to place ourselves in the Examiner's place, and either guess what he would have allowed if faced with the question, or substitute our judgment for that of the Examiner, who is the expert in this field."47 To the court in Nationwide, prosecution history estoppel is an expression of judicial deference to the determination of the examiner and the patentee as to what was necessary to secure claim patentability over prior art, especially when that particular claim was in dispute during prosecution.

III. NARROW APPLICATION

The forebearer of the narrow application approach in the Federal Circuit is Hughes Aircraft Co. v. United States.47 In that case, the plaintiff conceded that there was no literal infringement and sought a finding of infringement solely on the basis of the doctrine of equivalents.48 The court, in discussing prosecution history estoppel, stated that some courts had held that "virtually any amendment of the claims" barred application of the doctrine of

43. Id. at 406.
44. While it is hardly surprising that a doctrine called "prosecution history estoppel" has its legal basis in the concept of estoppel, there is considerable question as to whether the doctrine in fact is an estoppel concept. See infra text accompanying notes 118-22.
45. 584 F.2d 714 (5th Cir. 1978). The plaintiff's patented method of applying its chemical to citrus trees called for a dosage of less than four ounces per acre. The prior art reference had stipulated a dosage of 48 ounces per acre. The defendant's method required that "greater than four ounces per acre" be applied. The court held that plaintiff was estopped to broaden the scope of his claim beyond the literal language of "less than four ounces per acre" by the doctrine of equivalents. Id. at 716.
46. Id. at 718.
47. 717 F.2d 1351 (Fed. Cir. 1983).
48. Id. at 1361.

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equivalents.\textsuperscript{49} The court rejected this use of prosecution history estoppel as "wooden" and as "negating entirely the doctrine of equivalents."\textsuperscript{50} It reasoned that the:

[a]mendment of claims is a common practice in prosecution of patent applications. No reason or warrant exists for limiting application of the doctrine of equivalents to those comparatively few claims allowed exactly as originally filed and never amended. Amendments may be of different types and may serve different functions. Depending on the nature and purpose of an amendment, it may have a limiting effect within a spectrum ranging from great to small to zero. The effect may or may not be fatal to application of a range of equivalents broad enough to encompass a particular accused product. It is not fatal to application of the doctrine itself.\textsuperscript{51}

In analyzing the claims before it, the court concluded that the amendments "did not relate to any disclosure ‘in the prior art or elsewhere,’ " and although they had some limiting effect, the amendments did not bar the plaintiff's resort to the doctrine of equivalents.\textsuperscript{52}

The other statement of the narrow application of prosecution history estoppel, which is often cited in conjunction with Hughes, is that when considering the claims in light of the prosecution history:

a close examination must be made as to not only what was surrendered, but also the reason for such a surrender. The fact that claims were narrowed does not always mean that the doctrine of file history estoppel completely prohibits a patentee from recapturing some of what was originally claimed.\textsuperscript{53}

While Hughes clearly mandates determining the limiting effect of the amendments in the context of the prosecution history, the latter statement seems to go further. The limitation on the scope of the claim will arise through the literal terms of the amendment. In order to recapture what has been given up, the court must determine that some of those terms were not necessary to secure claim allowance. This result conflicts with the broad application analysis which presumes that all elements of an amended claim are material to allowance.\textsuperscript{54}

Another example of the narrow application of prosecution history estoppel is found in Moeller v. Iontics, Inc.\textsuperscript{55} The alleged infringement was of a patent for an electrode system used to measure potassium ion cations. The examiner rejected some of the claims initially filed as obvious in light of prior art. The applicant amended his claims including, among other things, the statement

\begin{itemize}
    \item \textsuperscript{49} Id. at 1362.
    \item \textsuperscript{50} Id.
    \item \textsuperscript{51} Id. at 1363.
    \item \textsuperscript{52} Id.
    \item \textsuperscript{53} Bayer Aktiengesellschaft v. Duphar Int'l Research, 738 F.2d 1237, 1243 (Fed. Cir. 1984).
    \item \textsuperscript{54} See supra note 37 and accompanying text.
    \item \textsuperscript{55} 794 F.2d 653 (Fed. Cir. 1986). The case was heard on appeal from a grant of a motion for summary judgment by the defendant.
\end{itemize}
that the invention included an electrode body for supporting the membrane.\textsuperscript{56} The examiner found this amendment to be insufficient to distinguish the prior art. However, the examiner agreed to allow the claim with the inclusion of the phrase "an electrode disposed in said body."\textsuperscript{57} The stated purpose of the amendments was to more specifically point out that the invention was not the ion selecting capability of the membrane, but rather the use of such a membrane in an electrode system.\textsuperscript{58}

In the allegedly infringing electrode system, the electrode\textsuperscript{59} protruded from the electrode body.\textsuperscript{60} The defendant contended this difference distinguished its device from the plaintiff's, in which the electrode was entirely within the electrode body. Factually, the issue is the same one as in \textit{Kinzenbaw}. After the examiner's rejection, the defendant had changed an element of his device, which was specifically limited by amendment, in order to obtain the claim allowance. The court in this instance was willing to determine the necessity of the language "disposed in said body" to the patentability of the plaintiff's electrode system. The court concluded that the invention encompassed all electrode systems incorporating the ion selecting membrane, which was the plaintiff's contention.\textsuperscript{61} The court speculated that:

[p]ossibly, in the examiner's mind, [the language "disposed in said body"] was needed to exclude potential application of the claim language to read on future devices that might do the job in a different way, but if it was intended not to read on such a device as that of [the defendant's], it failed to do so with any clarity.\textsuperscript{62}

\textit{Moeller} adopts the most narrow approach to the application of prosecution history estoppel suggested in \textit{Hughes}.\textsuperscript{63} The patentee is allowed to recapture some of the scope of his claim apparently surrendered during prosecution. This result stands in clear contrast to the approach taken with broad application prosecution history estoppel. First, the willingness to conclude that the words "disposed in said body" were in effect not necessary or material to claim al-

\begin{itemize}
  \item \textsuperscript{56} \textit{Id.} at 658. The membrane serves the purpose of selecting the specific positively charged ions to be measured by the electrode system.
  \item \textsuperscript{57} \textit{Id.} at 658-59. The amendment was made by the examiner, not the applicant.
  \item \textsuperscript{58} \textit{Id.} at 659.
  \item \textsuperscript{59} Actually, there was dispute as to how the word "electrode" was used in the claims. The defendant asserted that "electrode" referred only to the part of the conducting silver wire which protruded from the plastic tube and was covered by the membrane. Plaintiff contended that "electrode" was used alternatively to mean "[t]he entire system", "[t]he entire length of the electrically conducting wire", and "[t]he tip of the wire to be immersed into the solution." \textit{Id.} at 657.
  \item \textsuperscript{60} \textit{Id.} The court doubted the reasonableness of the district court's conclusion that the defendant's device had an electrode which protruded from the body. \textit{Id.}
  \item \textsuperscript{61} \textit{Id.} It should be remembered that on a review of a grant of a motion for summary judgment, the court weighs the inferences from the facts in favor of the nonmovant. \textit{Id.} at 656 (citing SRI Int'l v. Matshusita Elec. Corp., 775 F.2d 1107, 1116 (Fed. Cir. 1985) (en banc)).
  \item \textsuperscript{62} \textit{Moeller} v. Ioneetics, Inc., 794 F.2d 653, 659 (Fed. Cir. 1986).
  \item \textsuperscript{63} \textit{See supra} text accompanying notes 51-52.
\end{itemize}
lowance rejects the judicial deference rationale underlying broad application prosecution history estoppel. Second, in *Moeller* the applicant amended his claim to avoid prior art, and the accused device differed from the allegedly infringed device with respect to the amended portion of the claim. However, those circumstances were not found to bar the plaintiff from using the doctrine of equivalents. This would seem to reject estoppel as a basis for the application of prosecution history estoppel.

It is much easier to recognize which principles the narrow application rejects than it is to recognize those which it embraces. In fact, the answer may be that it embraces no "principles" at all. The doctrine of equivalents is an equitable doctrine and as such, it may be argued, exists outside the realm of well defined rules. Learned Hand, in considering the doctrine of equivalents, noted that it was a doctrine which fell particularly within the discretion of the court. "It is," he wrote, "difficult to give [the application of the doctrine of equivalents in any single case] greater authority than an appeal to the sympathetic understanding of an impartial reader." Judge Hand concluded that it was "impossible" to set conceptual boundaries on the application of the doctrine of equivalents when the very nature of the doctrine was to relieve "those who have failed to express their complete meaning." This lack of rules limits the application of the doctrine of equivalents, belittles the value of precedent and leaves the court to decide for itself the scope of the doctrine based on the actual language of the claims, the prior art, and the originality of the invention. Although Judge Hand did not specifically write about prosecution history estoppel, he clearly favors a narrow application, inasmuch as he rejects a formalized approach. The Federal Circuit panels in *Moeller* and *Loctite* have given a very similar explanation of their approach to prosecution history estoppel. The court put itself in place of the examiner in concluding that the patent covered all electrode systems which incorporate a like cation selecting membrane. The court further assumed such a role in finding that the words suggested by the examiner himself, that the electrode be disposed in the electrode body, did not carry the limitation on the plaintiff's claim which a literal reading of those words would suggest.

IV. SUPREME COURT DECISIONS

The conflict over broad or narrow application of prosecution history estoppel in the Federal Circuit could be rendered superfluous by a pronouncement

65. *See* Claude Neon Lights, Inc. v. E. Machlett & Sons, 36 F.2d 574, 576 (2d Cir. 1929).
66. *Id.*
67. *See id.*
68. Moeller v. Ionetics, Inc., 794 F.2d 653, 659 (Fed. Cir. 1986). The court wrote that the application of prosecution history estoppel must be done on a "case-by-case basis, guided by equitable and public policy principles ..." *Id.* (quoting Loctite Corp. v. Ultrasel Ltd., 781 F.2d 861, 871 n.7 (Fed. Cir. 1985)).
from the Supreme Court on the subject. Although the Court has not spoken for a number of years, it has considered prosecution history estoppel in the past. In so doing, the Court uniformly agreed that where a claim was amended as a result of rejection during prosecution, the patentee may not "by resort to the doctrine of equivalents, to give the claim the larger scope which it might have had without the amendments . . . ." This rule of prosecution history estoppel is a function of the more general rule of claim construction "that the claim as allowed must be read and interpreted with reference to the rejected claim and to the prior state of the art, and cannot be so construed as to cover either what was rejected by the Patent Office or disclosed by prior devices." However, as noted above in the Introduction, agreement with the formulation of the appropriate rule to be applied is of little consequence or aid in determining how prosecution history estoppel limits the doctrine of equivalents in a given factual situation.

Further, the Supreme Court cases fail to distinguish adequately between prosecution history as a limit of the literal language of the claims and prosecution history estoppel. Hubbell v. United States is illustrative of this failure in that the bulk of the Court's opinion used the prosecution history to interpret the language of the claim in question. After concluding the amendments have so narrowed the claim that the literal language does not encompass the accused device, the Court summarily refused to apply the doctrine of equivalents. But this summary dismissal of the doctrine of equivalents should not be interpreted as necessarily supporting a broad application of prosecution history estoppel. The interpretation of the literal language of the claim may pale imperceptibly into a doctrine of equivalents analysis in that the two are distinguishable as a matter of degree rather than of kind. In this vein, the

70. Hubbell v. United States, 179 U.S. 77, 80 (1900). The Court also recognized that the source of these benchmarks of construction was the prosecution history or "file wrapper" of the claim.
71. See supra text accompanying notes 18-20.
73. Id. at 82.
74. Id. at 83.
75. Id. at 86. The Hubbell Court stated:

Nor can we accept the contention that these two combinations are identical because they are intended to obtain the same result. What we have to consider is not whether the end sought to be effected is the same, but whether the devices or mechanical means by which the desired result are secured are the same.

Id. Needless to say, this apparent reference to the nonapplicability of the doctrine of equivalents is opaque at best.
Hubbell Court noted:

[It] is quite true that, where the difference between the claim as made and as allowed consist of mere changes of expression, having substantially the same meaning, such changes, made to meet the views of the examiners, ought not to be permitted to defeat a meritorious claimant. While not allowed to revive a rejected claim, by a broad construction of the claim allowed, yet the patentee is entitled to a fair construction of the terms of his claim as actually granted.76

Thus, the Hubbell Court seems to reject the notion that any amendment to a claim, regardless of purpose, limits the patentee to only the narrowest interpretation of that claim. Whether this has any bearing on the availability of the doctrine of equivalents is difficult to determine in light of the rather abortive discussion of the doctrine of equivalents in the opinion.

The United States Supreme Court's clearest explanation of the interaction between the doctrine of equivalents and prosecution history estoppel is found in Exhibit Supply Co. v. Ace Patents Corp.77 The case supports the proposition that an amendment to a claim to avoid a prior art rejection bars all resort to the doctrine of equivalents.78 But it as well has been cited in support of the apparently contrary position that an amendment to a claim does not confine its scope to the specification set out in the application.79 The infringement action in Exhibit Supply Co. concerned a patent for a device used in a pin ball game. The device was a coil spring mounted above the table which, when struck by the pin ball would flex and contact a conducting annulus embedded in the table, thereby closing a circuit.80 During prosecution of the patent, the patentee amended his claim from the general statement that the "conductor means" (the annulus) would be "carried by the table" to a more specific statement that said conductor would be "embedded" in the table.81

Several devices were at issue in the suit. Two of them replaced the annulus with pins or nails driven into the table but protruding above its surface.82 The Court found these devices to be covered by the patent claims as written, using the prosecution history to aid in its interpretation of the claim's literal language.83 The claim could not have been so broad as to include all conductor

76. Id. at 80.
77. 315 U.S. 126 (1942).
79. See D. Chisum, PATENTS § 18.02[3], at 18-18 (1987).
81. Id. at 132.
82. Id. at 134.
83. The dictionary definition of "embedded" did not suggest that the conductor means had to be located entirely between the upper and lower surface of the table. However, the Court also looked at the specifications, drawings and statements by the examiner which confirmed that patentee had not chosen other than the normal meaning of embedded. Id. at 135. The patentee is free to give words in his patent the mean-
means carried by the table, but did include conductor means embedded in the table. The Court found that the accused device was covered without reaching beyond the literal language of the claim. It did not touch upon the doctrine of equivalents or prosecution history estoppel in making this determination.

In the other four accused devices the conductor was not embedded in the table, but either supported by a plate resting on the table or by a standard which also supported the coil spring. Finding no literal infringement, the Court refused the plaintiff's invitation to find infringement by the doctrine of equivalents. The Court stated that the patentee had by his amendment disclaimed the difference between conductors "carried by the table" and those "embedded in the table." The disclaimer "must be regarded as material, and . . . strictly construed against him." Therefore, the Court limited the patent claim to cover only a "conductor means, which although carried by the table, is also embedded in it." The patentee was not allowed to regain what he disclaimed "by recourse to the doctrine of equivalents." The Supreme Court, therefore, appears to have embraced the broad application of prosecution history estoppel in that it refused to determine whether the amended claim has any range of equivalents.

On the other hand, the Court did not thoroughly analyze prosecution history estoppel. Further, as is shown in the examiner's objection, the patent was granted on a fairly narrow distinction of prior art, implying that the range of equivalents for this invention was small or nonexistent. Unfortunately, then, a definitive answer as to the proper application of prosecution history estoppel cannot be found in the opinions of the Supreme Court.

V. Broad v. Narrow

While the preceding sections considered the broad and narrow application of prosecution history estoppel individually, a clearer understanding of the doctrines is found in their juxtaposition. Two cases aptly suited for such comparison are Hughes and Kinzenbaw. Chief Judge Markey of the Federal Circuit wrote the majority opinion in both. These cases seem to be the foundations for

49. Although the drawings showed the conductor to be an annulus, the Court did not go beyond the language of the claims to find the pins and nails used in the accused device fell within the scope of the invention. The claim language was for a "conductor means" and not the specific conductor, the annulus, shown in the drawings.
50. Id. at 130-31. Interestingly, the defendant urged the Court to discard the doctrine of equivalents as inconsistent with the statutory rule that the claim shall describe the invention. The Court did not reach this conclusion. Id. at 136.
51. Id. at 137.
52. Id. (citations omitted).
53. Id. at 136.
54. Id. at 137.
55. Id. at 133.
the divergent approaches to prosecution history estoppel espoused by different panels of the Federal Circuit. The panel in Kinzenbaw, which was the later of the two opinions, did not consider themselves in conflict with the Hughes decision. In fact, the court cited Hughes as support for the patentee's contention that the limitation placed upon the invention by claim amendment, upon which the defendant sought to distinguish his device, "was unnecessary to avoid prior art." In spite of evidence that the particular amendment was "irrelevant" to the allowance of the claim, the Kinzenbaw court did not explain its view of the Hughes holding nor distinguish it.

It is possible to see Hughes and Kinzenbaw as consistent applications of prosecution history estoppel. The rule of Hughes was that amendments to claims have a different limiting effect depending upon their "nature and purpose." Applying this rule, the Hughes court found that the patentee's "amendment of claims did not relate to any disclosure in the prior art," of devices having elements like those in the accused device. The amendment made it clear that the applicant was not claiming "all structures in which a pulsed jet is used to precess the spin axis [of the space vehicle]." The patentee's point of novelty related to the apparatus for indicating the position of the vehicle with respect to a fixed external coordinate system and the relay of that information to Earth for ground controlled position correction. The amendment served to distinguish patentee's invention not by degree, but in kind. Therefore, the prior art reference did not serve to limit the scope of the patentee's amended claims.

The facts of Kinzenbaw presented a very different situation. The claim was amended to avoid a prior art reference relating to gauge wheels. The element of the defendant's device which was allegedly equivalent, and thus infringing, was the gauge wheel. Accordingly, the limiting effect of the amendment was considerable. In contrast to the situation in Hughes, the patentee's amendment was not a "natural" one, and the Kinzenbaw panel correctly did not consider the Hughes holding inapplicable to the Kinzenbaw facts.

92. See the discussion of the cases in Moeller v. Ionetics, Inc., 794 F.2d 653, 659 (Fed. Cir. 1986); Loctite Corp. v. Ultrasel Ltd., 781 F.2d 861, 871 (Fed. Cir. 1985); Strawbridge, McDonald & Moy, supra note 26, at 887-89.
94. Id.
96. Id.
97. Id. at 1362. This type of device was well disclosed in the prior art, and the patentee was barred by prosecution history estoppel from making any claims to such a device. Id.
98. See id. at 1356.
99. "[The patentee's] amendment of the claims did not relate to any disclosure in the prior art or elsewhere, in which ISA position was stored in a computer along with command signals for later execution." Id. at 1363.
101. The reader should note that the plaintiff's patent was in a "crowded art," Id. at 389. The range of equivalents for a patent claim in a crowded art is very limited, even if the claim had never been amended or in any other way narrowed, because there are so many other claims in the same area that the patentee's claim's validity rests on a
tee's invention was part of a crowded art. The patentability of the device rested upon a narrow distinction which was the amendment emphasized so as to avoid rejection. The large number of similar devices previously disclosed in the art prompted the court's determination, without reference to the prosecution history, that the range of equivalents was small or nonexistent. Given the nature and purpose of the amendment was to avoid a prior art reference in a crowded field, the Hughes court agreed that the limiting effect of the amendment was so great as to confine the scope of the claim to its literal terms.

The Kinzenbaw court refused to determine whether the limitation made in response to the examiner's rejection was necessary to distinguish the prior art. This refusal does not place the Kinzenbaw decision at odds with Hughes. Hughes contemplates defining an amended claim's range of equivalents in light of purposes and prior art references cited in the prosecution history. This is quite different from the evaluation of whether an amendment's particular limitation was necessary to overcome the examiner's rejection, as in Kinzenbaw. The former is a matter of interpretation which is clearly within a court's expertise, while the latter falls within the expertise of the applicant and the patent examiner. Kinzenbaw, then, does not stand for the proposition that any limiting amendment to a claim bars resort to the doctrine of equivalents. Hughes, at least upon its facts, does not stand for the proposition that the court may re-evaluate whether a particular limitation was necessary for the claim to be allowed.102 Hughes and Kinzenbaw do not espouse a single coherent approach to prosecution history estoppel. However, they should not be looked upon as the respective bases for divergent schools of thought as to prosecution history estoppel.

The Federal Circuit has compared Hughes and Kinzenbaw. In Loctite Corp. v. Ultraseal Ltd.,103 the court embraced the narrow application approach it found in Hughes and Bayer Aktiengesellschaft v. Duphar International Research.104 In a footnote, the court mentioned Kinzenbaw. Judge Baldwin wrote:

the court was unwilling under the facts there presented to "undertake the speculative inquiry" as to the necessity of certain claim amendments and otherwise to enlarge the literal scope of patent claims amended during prosecution. The results reached there only highlight that application of prosecution history estoppel to limit the doctrine of equivalents should be performed as a legal matter on a case-by-case basis guided by equitable and public policy

rather small distinction. The import of a crowded art to the application of prosecution history estoppel is that it is far less likely that any limiting amendment could have only a small effect on the range of equivalents included within the scope of the claim. In fact, any amendment would almost certainly preclude the existence of any equivalents. 102. But see supra text accompanying notes 53-54. 103. 781 F.2d 861 (Fed. Cir. 1985). 104. Id. at 871.
principles underlying the doctrines involved by the facts of the particular case.\textsuperscript{105}

The Federal Circuit's loose approach to the application of prosecution history estoppel, to the surprise of no one, has been criticized.\textsuperscript{108} It is easy to be critical of the off-handed treatment which prosecution history estoppel received in \textit{Loctite}. The court suggested that in some factual situations, such as in \textit{Kinzenbaw}, it is acceptable to apply the more formal approach of broad application history estoppel while in others there can be no formal approach. The \textit{Moeller} court was quite right to recognize this inconsistency and conclude that \textit{Loctite} limited \textit{Kinzenbaw} to its facts.\textsuperscript{107} However, the fact intensive and policy oriented approach deemed appropriate by the \textit{Loctite} court is consistent with the Learned Hand's analysis (discussed previously) of the narrow application prosecution history estoppel.\textsuperscript{108} Nevertheless, this approach lacks any discussion of the competing principles suggested in support of broad application. Most importantly, it fails to answer why such a vague treatment of prosecution history estoppel should be adopted in light of the tension between the doctrine of equivalents and the rule that the claims define the scope of the patent.

The springboard for the Federal Circuit's dive into the precedential void of public policy and equity on a case-by-case basis was, in part at least, that broad application prosecution history estoppel was too "wooden."\textsuperscript{109} One such ostensibly wooden case was \textit{Nationwide Chemical Corp. v. Wright}.\textsuperscript{110} Yet \textit{Nationwide} recognized limitations to the general rule of literal interpretation of the language of claims amended to avoid rejection. One such limitation posited that "an applicant should not be presumed to have made a disclaimer broader than necessary to yield to the actual challenge to his claim."\textsuperscript{111} The court stated that this exception applies\textsuperscript{112} where "the limitation in the claim was not

\textsuperscript{105} Id. at n.7 (emphasis added).
\textsuperscript{106} See Strawbridge, McDonald & Moy, supra note 26, at 888 ("The Federal Circuit's . . . statements that it will be guided in [the area of prosecution history estoppel] by equitable and public policy principles and the facts of the case are so broad and diffuse that they are essentially useless as precedent.").
\textsuperscript{107} Moeller v. Ionetics, Inc., 794 F.2d 653, 659 (Fed. Cir. 1986).
\textsuperscript{108} See supra text accompanying notes 65-67.
\textsuperscript{109} Hughes Aircraft Co. v. United States, 717 F.2d 1351, 1362 (Fed. Cir. 1983).
\textsuperscript{110} 584 F.2d 714 (5th Cir. 1978).
\textsuperscript{111} Id. at 718 (quoting Ziegler v. Phillips Petroleum Co., 483 F.2d 858, 871 (5th Cir.), cert. denied, 414 U.S. 1079 (1973)); see also Hunt Tool Co. v. Lawrence, 242 F.2d 347, 354 (5th Cir.), cert. denied, 354 U.S. 910 (1957).
\textsuperscript{112} In addition to this situation, the court held that the exception should apply when the dimension or dosage element of the allegedly infringing device "falls on the other side of the patent in suit from the prior art." Nationwide Chem. Corp. v. Wright, 584 F.2d 714, 719 (5th Cir. 1978). For instance, if the prior art specified a dosage of 48 ounces of a certain chemical and the patented method had amended its claim to stipulate two to four ounces, a product calling for one ounce of the chemical could fall within the range of equivalents still available to the claim. However, if the allegedly
inserted to overcome any prior art." Albeit in a minor way, the court in Nationwide recognized the Hughes admonition that amendments have differing purposes and therefore the limiting effect of any particular amendment may be difficult to ascertain. To be certain, Nationwide tightly reigns in this exception to prosecution history estoppel. So long as the amendment was necessary to avoid prior art, the court looks no further before applying prosecution history estoppel to bar patentee's assertion of equivalence. However, it is conceivable the Nationwide court could have reached the same result in Hughes as did the Federal Circuit. The amendments in Hughes were not for the purpose of overriding prior art.

Comparing cases espousing broad application prosecution history estoppel with those adopting a narrow application gives rise to several observations. First, the distinction between the approaches, as it has developed in the Federal Circuit, is based, at least in part, on the false assumption that Hughes and Kinzenbaw are irreconcilable. The Federal Circuit has failed to adequately discuss the underlying policies and principles which compel it to adopt a narrow application approach to prosecution history estoppel. The only reason the Circuit articulates appears to be that the broad application approach is too wooden and therefore too unfair. However, the broad application approach is not as wooden as it appears, and is supported by policy and principles of its own. Courts should consider more fully the competing policies and principles before, as apparently done in Moeller and Loctite, concluding that no criteria for the application of prosecution history estoppel can be defined.

VI. LEGAL AND EQUIitable PRINCIPLES

To some extent, the lack of consistent application of prosecution history estoppel has been a failure to find or to agree upon the legal and equitable principles served by prosecution history estoppel. Federal Circuit panels in Kinzenbaw and Prodyne Enterprises, Inc. v. Julie Pomerantz, Inc.117 suggested that, as the name indicates, prosecution history estoppel is an estoppel

infringing product called for a dosage of five ounces it would not be in the scope of the equivalents of that claim. See id. at 719. This presumption or exception to the rule that a limiting amendment bars resort to the doctrine of equivalents is arbitrary and wooden. No sound reason is given for distinguishing between equivalents on one end of a range from equivalents on the other end simply because they more closely approximate or approach the prior art.

113. Id.
115. "Since [the plaintiff] was forced to introduce some dosage restriction . . . we look no further and hold [the plaintiff] 'strictly to the letter of the claims granted' to it." Nationwide Chem. Corp. v. Wright, 584 F.2d 714, 719 (5th Cir. 1978) (quoting Ekco Prods. Co. v. Chicago Metallic Mfg. Co., 347 F.2d 453, 455 (7th Cir. 1965)).
116. See supra text accompanying notes 97-99.
117. 743 F.2d 1581 (Fed. Cir. 1984).
concept. There are several difficulties with this approach. Traditional estoppel contemplates reliance to one's detriment on the words or acts of one's adversary. Indeed, in the average infringement case, it is unlikely that the alleged infringer actually searched the prosecution history and was misled by the patentee's representations.

In a situation like that in Kinzenbaw, there may have been reliance on the prosecution history, in that the infringer had been seeking ways to avoid the patent held by the plaintiff. However, to predicate the imposition of prosecution history estoppel on the alleged infringer's belief that some aspect of the claim had been surrendered during prosecution allows potential infringers to define the scope of patent claims. Such scopes are more appropriately defined by the language of the claims, and by judicial interpretation of them through the doctrine of equivalents. Further, prosecution history estoppel is unlike traditional estoppel in that it is not an affirmative defense and may be raised for the first time on appeal.

Another common legal basis for prosecution history estoppel is abandonment. The Supreme Court has explained prosecution history estoppel in terms of what the patentee abandoned or disclaimed during prosecution. Abandonment implies that the patentee intentionally relinquished a particular equivalent or range of equivalents. However, the patentee cannot have intentionally abandoned an equivalent of which he, by definition of the doctrine of equivalents, was unaware when he wrote the patent claim. Abandonment, then, is a poor basis for prosecution history estoppel.

Chisum has suggested that prosecution history estoppel is an exhaustion of administrative remedies concept, and therefore the "appropriate inquiry is whether the [prosecution history] reveals a construction of the claim in question held mutually by the patent examiner and the applicant which is at variance with the construction currently relied upon by the patent owner." This

118. See supra notes 38-44.
120. Id. "It is particularly difficult to picture the large number of alleged infringers sifting through the patent office files and being misled by applicants' statements contained in those records. How much easier it is to conceive of these persons unknowingly producing an allegedly infringing device or using their ingenuity to remain outside the scope of the patent claims." Id.
121. See Kinzenbaw v. Deere & Co., 741 F.2d 383, 385-86 (Fed. Cir. 1984). Kinze Manufacturing Co. had purchased Deere's patented row planter, the subject of this suit, attached its own tool bar and then sold the combination as a unit. Kinze had considerable difficulty in getting Deere to supply enough row planters, although it had already been to court once over the matter.
124. See Dvorak, supra note 119, at 145-46.
is appealing in that it focuses the court on the prosecution record rather than on an independent conclusion as to the scope of the invention. Such a focus allows the patent examiner, in conjunction with the applicant, to define the invention and it leaves the court to interpret what has been granted with the aid of the prosecution history. The problem with the inquiry is that the doctrine of equivalents comes into play when the applicant and examiner failed to anticipate the equivalent device or process. It is unrealistic to assume that the applicant and examiner had agreed upon a construction of the claim which would specifically exclude the equivalent in question. Had such a mutually held construction been in existence, it would have been part of the literal language of the claim. Thus, Chisum probably is suggesting a narrow application of prosecution history estoppel. The doctrine of equivalents is, under this approach, limited by prosecution history estoppel only when the record reveals that the applicant and examiner had affirmatively excluded a particular equivalent of the final claim. Presumably if the prosecution history is inconclusive, the finding of equivalency would stand.

In an article written twenty years ago, Dvorak reiterated that a fundamental basis of patent law is that the patentee is entitled to protection for what he has invented and nothing else. Prosecution history estoppel is merely a manifestation of this fundamental rule. The court must look, according to Dvorak, for the limitations which were placed on “essential technical terms used in the patent claims.” An essential technical term in a claim is one which defines the “essence” of the invention. Clearly this approach invites the court to determine whether a particular amendment was necessary to the invention, which the court refused to do in Kinzenbaw.

One rationale for the formal approach of broad application prosecution history estoppel is judicial deference. This rationale is relied upon in cases where the court refuses to speculate as to whether all the terms of the amendment to a claim were necessary for allowance. Any time a court applies the doctrine of equivalents it implicitly concludes that the relevant terms of the claim were not, at least as to their literal meaning, necessary to claim allowance. Unless there is a reason for applying judicial deference when a claim has been amended and for failing to do so when there has been no amendment, the judicial deference rationale is hopelessly inconsistent. When a claim has been amended to avoid a rejection based on prior art, and especially where there have been repeated rejections and amendments, the court can be reasonably certain that the applicant and the patent examiner have focused their attention upon the terms of the amendment and are unlikely to have inadvertently made the claim too narrow. Such certainty further accords with the conflict between the rule that the claims define the scope of the invention and the

126. See Dvorak, supra note 119, at 150.
127. Dvorak, supra note 119, at 148 (emphasis in original).
128. Id.
129. See supra text accompanying note 34.
130. See supra text accompanying note 46.
doctrine of equivalents. In addition, the conflict suggests that where the application of the doctrine of equivalents is dubious, such doubt should serve to limit the doctrine's use.

The tension between the language of the claims and the doctrine of equivalents also provides a partial explanation to Learned Hand's reasoning in adopting a no rules approach to the doctrine of equivalents.\textsuperscript{131} Hand's logic is compelling because the experts (the applicant and the examiner) who could have made their meaning clear had they anticipated the alleged equivalent, failed to do so. Therefore, there are no definable criteria for limiting the doctrine of equivalents in any formal way. But, the answer to Hand's argument lies in the inconsistency of the co-existence of the doctrine of equivalents with the rule that the claims define the invention. This inconsistency demands that any reasonable basis for limiting the doctrine of equivalents should be given a regular effect. Such a basis could be, as discussed above, that the amendment of the claim shows that the applicant and examiner have given special consideration as to what terms are necessary to secure claim allowance. In the future, the Federal Circuit in endeavoring to articulate a single coherent approach to prosecution history estoppel as it limits the doctrine of equivalents, should realize that any approach announced must balance between protecting a patentee's inventions on one side and the danger of extending that protection beyond the literal language the claims employ to define the invention on the other.

VII. CONCLUSION

In defining criteria for the application of prosecution history estoppel it should be remembered, if not necessarily in such Posnerian terms, that to some extent, the certainty of the law bears an inverse relationship to the degree to which equitable principles are involved. The doctrine of equivalents is an equitable doctrine and as such cannot be pinned to well defined rules. On the other hand, there are guidelines to limit the effect of prosecution history estoppel.

First, estoppel should be completely rejected as a basis for prosecution history estoppel. It does not adequately embody the relevant principles. The fundamental policy behind prosecution history estoppel is that the patentee receives protection for that which he has invented and disclosed in his patent, and nothing more. The fact that the alleged infringer may have been led to believe that some particular item was excluded from the claim cannot bar the patentee from receiving this protection. Clearly, public interest favors both the protection of inventions and free access to devices or processes in the public domain. Estoppel does not provide a useful vehicle for implementing these interests.

Second, the language of claims should be given the fullest meaning al-

\textsuperscript{131} See supra text accompanying notes 65-67.
loved by the prior art and limitations in the prosecution history. A rule that claims define the scope of the invention is not well served by summarily imposing a strict construction rule on any amended claim. An expansive reading of the terms of the claim does not run afoul, as does the doctrine of equivalents, of the rule that the claims define the scope of the invention. The court, then, should favor such expansive reading and be slow to reach the doctrine of equivalents analysis.

After broad construction and examination of the prosecution history, if the claims still do not cover the allegedly infringing device, the court should turn to the doctrine of equivalents. This necessarily implies that the court consider application of prosecution history estoppel. In claim interpretation the rules of construction attempt to implement the fundamental principle that the patentee receives protection for only what he has invented. Therefore, the equivalents of a claim cannot include material which falls within the scope of the prior art or equivalents of the prior art, nor may equivalents recapture claims surrendered by amendments in response to rejections. Prosecution history estoppel can aid the court in determining whether a given equivalent falls within one of these three proscribed area. During the prosecution process, through the rejection and amendment of claims, the applicant and examiner ascertain what is covered by prior art or its equivalents. Courts are, or should be, reluctant to second guess these determinations through court-made doctrine. Thus, the process of prosecuting a patent claim, which is reflected in the prosecution history, serves not only to define the invention but also to guide and restrain court in thier use of the doctrine of equivalents. Such restraints will ensure that courts do not institute independent patent claim procedures.

But it does not follow that a court should, upon finding a claim to have been amended, abandon the doctrine of equivalents. The Hughes court was correct in rejecting such an approach, especially given that the rejection of an applicant’s initial claims is almost certain. The court should investigate, by use of the prosecution history, the “nature and purpose” of the amendment before it determines whether prosecution history estoppel applies. The most important determination is whether the amendment was a result of a rejection based on a prior art reference. An amendment for any other purpose should have no effect. If the court is fortunate, the prosecution history may reveal that the patentee and examiner agreed on a construction of the claim which is at odds with the one he now puts forward. Clearly, such a situation would

132. Exhibit Supply Co. v. Ace Patents, Inc., 315 U.S. 126, 136 (1942); Parmelee Pharmaceutical Co. v. Zink, 285 F.2d 465, 472 (8th Cir. 1961). This view has been rejected by the Federal Circuit in Hughes and Moeller. See supra text accompanying notes 53-54, 62-64.
133. See supra text accompanying notes 49-52.
134. This would be a rejection for anticipation or obviousness.
136. See supra text accompanying note 125.
provide a proper occasion for the application of prosecution history estoppel. The "invention population" within the art of the patentee's invention also has bearing on the application of prosecution history estoppel.\textsuperscript{137} This consideration's usefulness is not found in bringing to light exactly what has been invented but rather is found in the realization that if the art is crowded, the likelihood of existing equivalents uncovered by prior art is minimal. However, the crowded art/pioneer art distinction is only useful in claim interpretation when the prosecution history clearly reveals extreme conditions are present in the particular art.

In the final analysis, the words of the claim should be given their fullest meaning within the limitations in the prosecution history. If the claim has been amended several times, each time due to rejections based on prior art, prosecution history estoppel should be applied so as to bar the doctrine of equivalents. In such a situation it is unlikely that the patentee and examiner failed to consider an equivalent. Where the relevant art is crowded, this result is even more appropriate. While this approach leaves grey areas of court discretion, such discretion will allow courts to deal with unanticipated factual situations while still honoring the principles which call for application of prosecution history estoppel.

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\begin{footnotesize}
\textsuperscript{137} See supra text following note 101.\end{footnotesize}