The Doctrine of Equivalents and Claiming the Future after Festo

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August 26, 2004
Forthcoming Federal Circuit Bar Journal (Fall 2004)

ABSTRACT

In two recent cases, Warner-Jenkinson Co. v. Hilton Davis Chemical Co., 520 U.S. 17 (1997), and Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 535 U.S. 722 (2002), the Supreme Court unanimously approved of the modern doctrine of equivalents articulated in Graver Tank & Manufacturing Co. v. Linde Air Products Co., 339 U.S. 605 (1950). The Court also extended equivalents protection to later-arising technologies and imperfectly reconciled the modern doctrine with the doctrine of prosecution history estoppel for amended claims. The Court’s new doctrine conflicts with historic implied-disclaimer standards. The U.S. Court of Appeals for the Federal Circuit has further revised the Supreme Court’s reconciliation of these doctrines for amended claims, and has adopted different standards for claim construction and argument estoppel that conflict with the Court’s new Festo standards. This article describes how the modern doctrine of equivalents operates and how it relates to prosecution history estoppel in light of the recent Supreme Court and Federal Circuit decisions. The article also discusses the differences between dedication of disclosed subject matter and implied disclaimer of equivalents and describes the conflicts that have been created among the claim scope, estoppel, and implied disclaimer doctrines. In particular, the article explains how the modern doctrine extends patent protection to later-arising equivalent technologies that the applicant could not have claimed and thus to which the modern doctrine should not apply.

This article is the first in a series of articles relating to the doctrine of equivalents. These articles seek to encourage and to set the context for future discussions of abolishing the modern doctrine of equivalents and of claiming later-arising technologies. The second article, to be published in two parts in the Journal of the Patent and Trademark Office Society, discusses the historic doctrine of equivalents, the Supreme Court’s radical reshaping of the doctrine in Graver Tank, and historic limits on claiming later-arising technologies. The second article explains how the modern doctrine of equivalents conflicts with the requirement for distinct claims adopted in the 1870 Patent Act, was adopted by the Supreme Court without statutory support, and was neither codified nor impliedly ratified by Congress in the 1952 Patent Act. The third article, to be published in the Berkeley Technology Law Journal, discusses the lack of theoretical justification for the modern doctrine of equivalents, the social costs that it imposes, and the doctrinal complexity that it creates. The third article argues that the doctrine of equivalents should be restored to its historic form, limiting patent scope to the interpreted language of patent claims, and that the Supreme Court or Congress may need to impose additional limits on the ability to claim later-arising technologies in order to effectuate the Constitutional purpose of promoting progress.
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The doctrine of equivalents allows the patentee to claim those insubstantial alterations that were not captured in drafting the original patent claim but which could be created through trivial changes. When, however, the patentee originally claimed the subject matter alleged to infringe but then narrowed the claim in response to a rejection, he may not argue that the surrendered territory comprised unforeseen subject matter that should be deemed equivalent to the literal claims of the issued patent.


[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. The doctrine of equivalents exists to prevent a fraud on a patent ... not to give a patentee something which he could not lawfully have obtained from the PTO had he tried.


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a Assistant Director, Glushko-Samuelson Intellectual Property Law Clinic, Washington College of Law, American University. Many ideas for this article were developed in collaboration with Shondell Foster, Samuel Hechtman, Georgina McCoughan, Justin Perillo, students in the Clinic who wrote a Supreme Court amicus brief in support of Respondents in the Festo case. I am also indebted to Michael Madison and Richard Ugelow for helpful criticism of the amicus brief I filed in the Federal Circuit in the Festo case on remand from the Supreme Court, to Linda Alcorn for citations in the amicus brief I filed in the Medtronic case, to Angela Malley, Timothy Tyre, Daniel Yampolski, and Shawnna Yashir for research assistance, to Jonathan Baker, David Chavkin, Donald Chisum, Christine Farley, Paul Janicke, Peter Jaszi, Mark Lemley, James Love, Michael Meurer, Craig Nard, Arthur Neustadt, Arti Rai, Joe Ricigliano, Ann Shalleck, Janet Spragens, Greg Vetter, and Douglas Wyatt for their helpful insights and comments, and to the Deans and Faculty of the Washington College of Law for providing the opportunity for me to return to teaching and scholarship.
INTRODUCTION

The relevant language of a patent that is supposed to define the scope of protected invention is found in the claims. Patent claims are formal, written descriptions that specify the scope of the invention for which patent protection is sought. The claims mark the boundaries of the invention to which intangible property rights attach, just like the written descriptions of metes and bounds in a deed mark the boundaries of real property to which tangible property rights attach. The language of the claims must be interpreted to determine the appropriate level of generality of the protected invention and in light of changing social contexts, and increasing skill in the relevant technological fields (the art).

Under current law, patent claims initially are construed by examiners in the U.S. Patent and Trademark Office (“Patent Office”), according to the broadest reasonable interpretation consistent with the written description of the invention contained in the specification that precedes the claims. Claims subsequently are construed by judges (rather than juries) in light of the specification and of the prosecution history in the Patent Office, as the document and its history would be understood by a skilled practitioner in the art as of the effective application date for the claim. Absent judgment as a matter of law, juries then determine as a question of fact whether the construed claims directly apply to the allegedly infringing product or process.

See, e.g., Continental Paper Bag Co. v. Eastern Paper Bag Co., 210 U.S. 405, 419 (1907) (“The invention, of course, must be described and the mode of putting it to practical use, but the claims measure the invention.”).


At least some of the current standards are likely to change following en banc review by the Federal Circuit of numerous issues relating to claim construction methodologies. See Phillips v. AWH Corp., Nos. 03-1269, 03-1286, 2004 WL 1627271 (Fed.Cir. July 21, 2004). The Supreme Court may further revise these standards, given the importance of the issues and their broad application.


The process of applying for and obtaining a patent is called patent prosecution. The objective evidentiary record of the prosecution is now called the prosecution history, but was once called the file wrapper. See, e.g., Autogiro Co. of Am. v. United States, 384 F.2d 391, 398 (Cl. Ct. 1967). See generally IRAH H. DONNER, PATENT PROSECUTION: PRACTICE AND PROCEDURE BEFORE THE U.S. PATENT OFFICE, ch. 2 (BNA Books, 2d ed. 1999).


I use the terms “directly apply” or “direct infringement,” rather than the more common “literally apply” or “literal infringement,” because claim construction may be non-literal. However, “direct infringement” is often used to refer both to construction and application of claims and to infringement under the doctrine of equivalents. See, e.g., Univ. of Houston L. Center, Institute for Intel. Prop. & Info. L., Decisions for 2002, http://www.patstats.org/2002.html (last visited Feb. 8, 2004) (categorizing infringement cases as “[l]iteral direct”
Patents also provide exclusive rights under the modern doctrine of equivalents. Under the modern doctrine, “a product or process that does not directly infringe upon the express terms of a patent claim may nonetheless be found to infringe if there is ‘equivalence’ between the elements of the accused product or process and the claimed elements of the patented invention.” The modern doctrine thus extends patent scope beyond the scope of physical embodiments (i.e., applications, whether or not enumerated in the specification) of a claim’s language. It extends the exclusionary patent law infringement right (and secondary liability) to additional products or processes that are considered to be equivalent to those embodiments. Because equivalency is considered to be a question of fact, absent judgment as a matter of law juries also determine infringement under the modern doctrine of equivalents.

This article explains how the modern doctrine of equivalents operates and relates to additional doctrines that determine patent scope. In two recent cases, Warner-Jenkinson Co. v. Hilton Davis Chemical Co., and Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., the Supreme Court unanimously upheld the modern doctrine from various statutory challenges.
extended equivalents protection to later-arising equivalent technologies, and imperfectly reconciled the modern doctrine with the doctrine of prosecution history estoppel for amended claims. In this context, prosecution history estoppel “provides a legal limitation on the application of the doctrine of equivalents by excluding from the range of equivalents subject matter surrendered during prosecution of the application for the patent.” The Court’s new standards for prosecution history estoppel conflict with historic implied-disclaimer doctrines. On remand in Festo, the U.S. Court of Appeals for the Federal Circuit further revised the Supreme Court’s reconciliation for amended claims. The Federal Circuit also has adopted standards for claim construction and argument estoppel that differ from the new Festo standards.

Part I of this article describes how the modern doctrine extends patent protection for unamended claims beyond the scope of application of construed claim language and extends patent scope to later-arising technologies. Part II discusses how the Supreme Court and the Federal Circuit have imperfectly reconciled the modern doctrine with the doctrine of prosecution history estoppel for amended claims. Part III analyzes the inconsistent doctrinal treatment accorded to claim interpretation, equivalents protection, and prosecution history estoppel by amendment and by argument. Subpart A analyses the potential for narrow claim constructions and estoppels over time, and the corresponding differences between the standards for dedication of unclaimed disclosed subject matter and for implied disclaimer. Subpart B describes the inconsistent treatment provided to argument-based and amendment-based estoppels. Subpart C discusses existing and potential limits to the modern doctrine of equivalents, based on claim scope doctrines – i.e., invention, regards-as-invention, written description, and enablement requirements – that would preclude claiming the equivalents at issue. In particular, Part III explains how the modern doctrine extends patent protection to later-arising equivalent technologies that the applicant could not validly have claimed and thus should not receive protection under the modern doctrine.

This article is the first in a series of articles relating to the doctrine of equivalents. These articles seek to encourage and to set the context for future discussions of abolishing the modern doctrine.


23 See Warner-Jenkinson, 520 U.S. at 30-34; Festo, 535 U.S. at 726-42.

24 Cybor Corp. v. FAS Techs., Inc., 138 F.3d 1448, 1460 (Fed. Cir. 1998) (en banc) (citation omitted).

Prosecution history estoppel is not limited to the doctrine of equivalents, but applies generally to claim construction issues. See Festo, 535 U.S. at 733 (prosecution history estoppel “is a ‘rule of patent construction’ that ensures that claims are interpreted by reference to those ‘that have been cancelled or rejected.’”) (citation omitted); R. Polk Wagner, Reconsidering Estoppel: Patent Administration and the Failure of Festo, 151 U. PA. L. REV. 159, 162 n.8, 176-77 (2002) (noting the “universal” view that prosecution history estoppel is solely a limitation on the doctrine of equivalents, even it predates the modern doctrine and is “based on theories of disclaimer and reliance”).

25 See, e.g., Exhibit Supply Co. v. Ace Patents Corp., 315 U.S. 126, 136-37 (1942) (“by narrowing the claim language in an amendment, the patentee recognized and emphasized the difference between the two phrases and proclaimed his abandonment of all that is embraced in that difference.... The difference which he thus disclaimed must be regarded as material, and since the amendment operates as a disclaimer of that difference it must be strictly construed against him.”) (citations omitted). See also Johnson & Johnson Assocs. v. R.E. Serv. Co., 285 F.3d 1046, 1054-55 (Fed. Cir. 2002) (en banc) (unclaimed disclosed equivalents are dedicated to the public).


The doctrine of equivalents and of claiming later-arising technologies. The second, two-part article explains how the modern doctrine of equivalents conflicts with the requirement for distinct claims adopted in the 1870 Patent Act, was adopted by the Supreme Court without statutory support in Graver Tank & Mfg. Co. v. Linde Air Products Co., and was neither codified nor impliedly ratified by Congress in the 1952 Patent Act. The courts as well as Congress thus may abolish the modern doctrine, notwithstanding the Supreme Court’s recent statement in Festo that “if the doctrine is to be discarded, it is Congress and not the Court that should do so.” The third article discusses the lack of theoretical justification for the modern doctrine of equivalents, the social costs that it imposes, and the doctrinal complexity that it creates. The third article argues that the doctrine of equivalents should be restored to its historic form, limiting patent protection to the scope of application of construed claim language, and that the Supreme Court or Congress may need to impose additional limits on claiming later-arising technologies in order to effectuate the constitutional purpose of “promot[ing] … Progress.”

I. The Modern Doctrine and Unamended Claims

The Supreme Court has not adopted a single standard for jury instructions to determine factual equivalency under the modern doctrine of equivalents. In Warner-Jenkinson Co. v. Hilton Davis Chemical Co., the Supreme Court refused to select (but did not discourage use of) any of the traditional formulations. Instead, the Court posited the “essential inquiry” as one in which “the accused product or process contain[s] elements identical or equivalent to each claimed element of the patented invention.” The Court thus restricted findings of equivalency only: (1) by requiring each limiting element of the claim to be directly or equivalently present in an infringing product or process, to avoid “‘enlarg[ing] a patent beyond the scope of its claims’”; and (2) by instructing lower courts to determine as a matter of law whether a finding
of equivalency in a particular case would “entirely vitiate a particular claim element.” The Court thus specified the level of generality of invention (for determining infringement) at the level of the specific limitations of claim language (without articulating standards for determining what constitutes a limitation).  

The Court in *Warner-Jenkinson* also held that the time for determining equivalency is the time of infringement, based on contemporaneous – *i.e.*, post-issuance, later-arising – knowledge of technological interchangeability of elements. Thus, a product or process may be found equivalent if it includes a technological element substituted for a claim limitation that is invented after the patent is issued or that is discovered to be a substitute after that time. This is true whether or not the later-arising technological substitute was or reasonably could have been contemplated by the inventor as part of the invention, as long as the substituted element does not entirely vitiate the claimed limitation that it does not embody. The modern doctrine of equivalents thus expands patent scope over time, particularly by comparison to claims for narrow, improvement inventions or to statutory equivalents of claims drafted using means-plus-function or step-plus-function claiming language. Such claims are limited in their scope of application to claimed – and for functionally claimed, equivalent – embodiments that were known to be substitutes at the time the patent issued.

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*Warner-Jenkinson*, 520 U.S. at 39 n.8. See *id.* at 29 (“effectively eliminate that element in its entirety”). Because the Supreme Court did not provide any theoretical guidance to determine when a claim limitation would be entirely vitiated, the Federal Circuit has reached results without adequate explanation of its reasoning. See, e.g., *Searfoss v. Pioneer Consul. Corp.*, 374 F.3d 1142, 1150-51 (Fed. Cir. 2004) (finding vitiation because equivalents protection “would require the court to ignore the [claim] construction”); *Ericsson, Inc. v. Harris Corp.*, 352 F.3d 1369, 1374-75 (Fed. Cir. 2003) (finding no vitiation based on a “trivial difference” of the accused product from the construed claim limitation); *Senior Techs., Inc. v. R.F. Techs., Inc.*, 76 Fed. Appx. 318, 322-23 (Fed. Cir. Sept. 17, 2003) (finding vitiation because the claim language “necessarily and implicitly excluded from the embodiment” equivalents that did not contain the claim limitation and because equivalency protection “would impermissibly delete an express limitation from the claims and abrogate the notice function of patent claims”).  

The determination of what constitutes a limitation of the claim is typically the critical determinant of whether an accused technology will infringe under the doctrine of equivalents. See, e.g., *Cooper Cameron Corp. v. Kvaerner Oilfield Prods., Inc.*, 291 F.3d 1317, 1321-22 (Fed. Cir. 2002) (rejecting patentee’s argument to redefine the applicable limitation more broadly). However, the same structural element can serve as an equivalent to more than one claim limitation, and multiple structural elements can be equivalent in function to a single claim limitation. See, e.g., *Eagle Comtronics, Inc. v. Arrow Comm. Labs., Inc.*, 305 F.3d 1303, 1317 (Fed. Cir. 2002).  

Improvement inventions are to be distinguished from pioneering inventions, which are entitled to claim a broader range of equivalents as embodiments. See, e.g., *Cochrane v. Deener*, 94 U.S. (4 Otto) 780, 787 (1876) (authorizing patents for pioneering processes); *Dolbear v. American Bell Telephone Co.*, 126 U.S. 1, 532-39 (1888) (authorizing use of broad, functional claiming language for pioneering inventions); *Morley Sewing Machine Co. v. Lancaster*, 129 U.S. 263, 273 (1889) (authorizing broad structural claims for pioneering inventions that would apply to later-arising substituted technologies).  

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II. The Modern Doctrine and Prosecution History Estoppel for Amended Claims

Because it upheld the validity of the modern doctrine of equivalents, the Supreme Court was forced to address how the modern doctrine relates to the historic doctrine of prosecution history estoppel. When estoppel is found, patentees are barred from recovering — through application of the modern doctrine of equivalents in infringement actions — some patentable subject matter that they expressly or impliedly disclaimed during prosecution of the claims in the Patent Office. The Court thus had to determine when and to what extent estoppel will apply.

A. Initial Reconciliation By the Supreme Court In Warner-Jenkinson

The Supreme Court in *Warner-Jenkinson* did not clearly resolve when an amendment creates prosecution history estoppel. The Court stated that estoppel arises “only where claims have been amended for a limited set of reasons.... Where the reason for the change was not related to avoiding the prior art, the change may introduce a new element, but it does not necessarily preclude infringement by equivalents of that element.” Instead of providing a list of reasons for amendment that trigger estoppel, the Court adopted a rebuttable presumption that inadequately explained claim amendments trigger an estoppel. “Where no explanation is established ... the court should presume that the patent applicant had a substantial reason related to patentability for including the limiting element added by amendment. In those circumstances, prosecution history estoppel would bar the application of the doctrine of equivalents as to that element.” The Court stated that its presumption “gives proper deference to the role of claims in defining an invention and providing public notice, and to the primacy of the PTO in ensuring that the claims allowed cover only subject matter that is properly patentable in a proffered patent application.” The requirements for patentability to which amendments may relate are: (1) statutory subject matter and practical utility; (2) novelty, invention, and avoidance of specific actions that cause the loss of patent rights; (3) non-obviousness in light of relevant prior art; (4) a written description, including the best mode known to the applicant, sufficient to enable persons skilled in the art to make and use the invention; and (5) formal claim language that

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* Warner-Jenkinson, 520 U.S. at 33-34.
* See 35 U.S.C. § 102 (2000). Section 102(f) prohibits patents when the applicant “did not himself invent the subject matter sought to be patented.” 35 U.S.C. § 102(f). Section 102(f) has typically been applied to prohibit derivation of the subject matter by the alleged inventor. See, e.g., *Eaton Corp. v. Rockwell Intern. Corp.*, 323 F.3d 1332, 1344 (Fed. Cir. 2003). However, in theory it could prohibit claims that exceed the actual scope of invention (or disclosed invention), similarly to application of the written description requirement of 35 U.S.C. § 112, ¶ 1 (2000); *University of Rochester v. G.D. Searle & Co.*, 358 F.3d 916, 930 n.10 (Fed. Cir. 2004) (discussing potential application of Section 102(f), *reh'g and reh'g en banc den.*, 375 F.3d 1303 (Fed. Cir. 2004).
distinctly identifies what the applicant regards as the invention to be patented.\(^{51}\)

In contrast, the Supreme Court appeared to clearly resolve the scope of any estoppel that was found to apply. Prior to \textit{Warner-Jenkinson}, the Federal Circuit in two lines of cases had alternately held that amendments creating prosecution history estoppel either flexibly estop some or completely estop all equivalents from being found to infringe the patent.\(^{52}\) In \textit{Warner-Jenkinson}, the Court held that all equivalents are barred, whether the reasons for the amendment are sufficient to trigger estoppel or are insufficient to rebut the presumption of estoppel.\(^{53}\)

Mindful that claims do indeed serve both a definitional and a notice function, we think the better rule is to place the burden on the patent holder to establish the reason for an amendment required during patent prosecution. The court then would decide whether that reason is sufficient to overcome prosecution history estoppel as a bar to application of the doctrine of equivalents to the element added by that amendment.\(^{54}\)

The Court thus completely barred any finding of equivalency to the amended claim limitation, at the level of generality on which equivalency is to be determined.\(^{55}\) If a limitation was added or revised by amendment and resulted in an estoppel, because unexplained or because related to patentability, no equivalents to the amended limitation could be found to infringe the patent.\(^{56}\)

In \textit{Warner-Jenkinson}, the patentee had amended the claim to add a pH limitation of “from approximately 6.0 to 9.0.” The amended limitation was found not to apply directly to the defendant’s process, which operated at a pH of 5.0.\(^{57}\) The upper pH range limitation was clearly


\(^{53}\) The Federal Circuit, however, did not uniformly read \textit{Warner-Jenkinson} in this way, requiring its later en banc consideration in \textit{Festo}. See \textit{supra} note 52. The Supreme Court subsequently revised this holding in \textit{Festo}. See 535 U.S. at 740.


\(^{55}\) See \textit{supra} notes 3, 36-38 and accompanying text.

\(^{56}\) See \textit{supra} note s 45, 54 and accompanying text.

added to avoid prior art. The alleged infringer had argued that the patentee had not enabled the
claimed process to operate properly below a pH of 6.0, and thus that the broader, original claim
was invalid. The patentee offered no explanation for the lower limitation. Because the reasons
for the amendment were not explained in the record, the Court held that resort to the modern
doctrine of equivalents was presumptively estopped. The Court remanded to provide an
opportunity for the patentee to rebut the presumption by offering reasons for having made the
amendment.

B. Revised Reconciliation By the Supreme Court In Festo

In Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., the Supreme Court revised
its earlier reconciliation of the modern doctrine of equivalents with prosecution history estoppel.
The Court adopted a rebuttable presumption that “a narrowing amendment made to satisfy any
requirement of the Patent Act may give rise to an estoppel” that places on the patentee “the
burden of showing that the amendment does not surrender the particular equivalent in
question.” The Court thus slightly revised its earlier approach to determining when estoppel
applies and the complete bar to equivalents that it had adopted in Warner-Jenkinson. The Court
adopted standards for rebutting the new Festo presumption that establish a flexible bar to
equivalents estoppel (although somewhat less flexible bar than the bar adopted by the Federal
Circuit in some of its pre-Festo cases).

1. Existence of Estoppel

Like in Warner-Jenkinson where it held that a “substantial reason” is required and that
non-art amendments may not “necessarily” trigger estoppel, the Supreme Court in Festo held
that a narrowing amendment made in regard to any patentability requirement “may” trigger an
estoppel. The Court’s uncertain trigger for estoppel makes little sense and lacks historic
justification. If the original claim was unpatentable for any reason, then the amendment
necessarily was made to satisfy patentability requirements (which provides a substantial reason
for having made it). This is true without regard to whether the Patent Office or the patentee first
recognized that the original claim was unpatentable, and thus without regard to whether the
amendment was triggered by Patent Office actions or was voluntarily initiated by the patentee.

But even if the original claim had been patentable, the patentee’s voluntary decision to
narrow coverage provides an equally compelling reason for estoppel. As the Court recognized in

58 See id. at 22 & n.2.
59 See id. at 41, remanded to 114 F.3d 1161, 1162-64 (Fed. Cir. 1997) (further remanding to the District
Court).
61 Id. at 736, 740 (emphasis added).
banc) (discussing the flexible bar cases), vacated 535 U.S. 722 (2002).
63 See Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 234 F.3d 558, 568 (Fed. Cir. 2000) (en banc),
vacated, 535 U.S. 722 (2002) (all amendments “signal to the public that subject matter has been surrendered....
There is no reason why prosecution history estoppel should arise if the Patent Office rejects a claim because it
believes the claim to be unpatentable, but not arise if the applicant amends a claim because he believes the claim to
be unpatentable.”).
“[a] patentee who narrows a claim as a condition for obtaining a patent disavows his claim to the broader subject matter.... We must regard the patentee as having conceded an inability to claim the broader subject matter or at least as having abandoned his right to appeal a rejection.”

So long as an amendment narrows the scope of a claim, it should in theory trigger some estoppel of equivalents to the amended claim limitation. For this reason, the Warner-Jenkinson presumption should be unnecessary after Festo for determining whether estoppel applies, except to the extent it is useful in construing whether an amendment narrowed a claim. Nevertheless, the Court in Festo suggested that the Warner-Jenkinson presumption continues to apply to determining whether the reason for a narrowing amendment should trigger estoppel and (if so) the scope of the estoppel.

Further, if an amendment was not made to satisfy patentability requirements (or was overly restrictive when doing so), the amendment may have improvidently disavowed patentable subject matter. Such a narrowing amendment also should impliedly disclaim patentable subject matter, triggering an irrebuttable estoppel. As the Court also recognized in Festo, by narrowing the claim language in an amendment, the patentee “recognized and emphasized the difference between the two phrases [and proclaimed his abandonment of all that is embraced in that difference]... [T]he difference which [the patentee] thus disclaimed must be regarded as material[, and since the amendment operates as a disclaimer of that difference it must be strictly construed against him].” At most, an unnecessary or excessive narrowing amendment may not necessarily disclaim equivalents that are (or were) outside the scope of the original claim. But the Court recognized this fact only in regard to its first rebuttal factor – foreseeability of the disclaimed equivalents – as discussed below.

2. Presumption of Complete Estoppel

The Supreme Court impliedly overruled Warner-Jenkinson when it held in Festo that a narrowing amendment that “give[s] rise” to an estoppel only shifts to the patentee the burden of proving “surrender [of] the particular equivalent in question.” This rebuttable presumption of a complete bar also makes little sense and lacks historic justification. In holding that estoppel bars application of the doctrine of equivalents to the amended claim limitation, the Court in Warner-Jenkinson did not suggest the possibility of case-by-case application. Nor would it be possible for the reasons for an amendment that triggered an estoppel to vary, depending on which

Festo, 535 U.S. at 737.

See Festo, 535 U.S. at 736-37 (“If a § 112 amendment is truly cosmetic, then it would not narrow the patent's scope or raise an estoppel.”).

See id. at 740 (the Warner-Jenkinson presumption applies to showing that “an amendment was not made for a reason that would give rise to estoppel”); id. (where the purpose of a narrowing amendment is not evident, “the court should presume that the patentee surrendered all subject matter between the broader and the narrower language”). The Court’s confusion may have resulted from the Federal Circuit’s dicta – contrary to the holding of Warner-Jenkinson – stating that the Supreme Court had not previously decided “the range of equivalents available to an amended claim element” once prosecution history estoppel was found to apply. Festo, 234 F.3d at 571. See supra notes 52-56 and accompanying text.

Cf. Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 344 F.3d 1359, 1375 n.4 (Fed. Cir. 2003) (en banc) (Rader, J., concurring) (noting the problem of determining the scope of surrender when the patentee disclaimed more than was necessary).

Festo, 535 U.S. at 734 (quoting Exhibit Supply Co. v. Ace Patents Corp., 315 U.S. 126, 136-37 (1942)) (emphasized language added from original text in Exhibit Supply).
equivalent was at issue in any given infringement action.

Prior to adoption of the modern doctrine of equivalents, moreover, the Supreme Court had articulated clear and irrebuttable standards for determining when amendments trigger an estoppel and the consequent scope of impliedly disclaimed, patentable disclosed subject matter. In late-19th and early-20th century cases, the Court cautioned against allowing patentees to argue in infringement actions for a broader scope of protection than they either had suggested by amendment or argument in the Patent Office or had acquiesced to by accepting the Patent Office’s rejection of broader claims. In regard to whether amendments narrowed the claims, the Court stated emphatically that patentee responses to Patent Office rejections are to be “strictly construed against the inventor and in favor of the public, and looked upon as in the nature of disclaimers.” Similarly, the Supreme Court repeatedly held that the effect of filing an amendment was the strict exclusion of all subject matter broader than the narrowed claim. “Having thus narrowed his claim … in order to obtain a patent the patentee may not by construction, or by resort to the doctrine of equivalents, give to the claim the larger scope which it might have had without the amendments [and accompanying arguments], which amount to a disclaimer.” As the Court recognized in Festo, “[w]ere it otherwise, the inventor might avoid the PTO’s gatekeeping role and seek to recapture in an infringement action the very subject matter surrendered as a condition of receiving the patent.”

Until Graver Tank & Manufacturing Co. v. Linde Air Products Co., moreover, the Supreme Court had not approved of equivalents protection beyond the scope of application of construed claim language. In the few cases that the Court may be thought to have provided an unusually liberal or a non-literal interpretation of the claims, the Court expressly stated or strongly suggested that it had construed the claims broadly rather than had provided protection beyond the scope of application of the construed claims. Accordingly, no Supreme Court case

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69 See, e.g., I.T.S. Rubber Co. v. Essex Rubber Co., 272 U.S. 429, 443-44 (1926); Hubbell v. United States, 179 U.S. 77, 80 (1900); Knapp v. Morss, 150 U.S. 221, 224-25, 230 (1893). Cf. Goodyear Dental Vulcanite Co. v. Davis, 102 U.S. (12 Otto) 222, 228 (1880) (noting that “it is reasonable to hold that … a construction may be confirmed by what the patentee said when he was making his application,” based on analogy to the relevance to interpretation of the understanding of parties to contracts).


72 Festo, 535 U.S. at 734 (citing Goodyear Dental Vulcanite, 102 U.S. (12 Otto) at 228).


74 See Ronald D. Hantman, Doctrine of Equivalents, 70 J. PAT. & TRADEMARK OFF. SOC’Y 511, 533 (1988) (prior to Graver Tank, only six cases exist in which the Court provided protection more broadly than the literal language of the claims suggested; and “in these cases the equivalent element is so close to the language of the claim, it is even arguable whether an expansive doctrine of equivalents was applied to the claims at all.”). See also id. at 533-35 (discussing Ives v. Hamilton, 92 U.S. (2 Otto) 426 (1875); Imhaeuser v. Buerk, 101 U.S. (11 Otto) 647 (1879); Royer v. Schultz Belting Co., 135 U.S. 319 (1890); Western Elec. Co. v. LaRue, 139 U.S. 601 (1890); Hoyt v. Horne, 145 U.S. 302 (1892); National Cash Register Co. v. Boston Cash Indicator and Recorder Co., 156 U.S. 502 (1895)). See generally Sarnoff Part I, supra note 29, __-__; Sarnoff Part II, supra note 29, __-__.

75 See Ives, 92 U.S. (2 Otto) at 430-31 (construing “curved guides” to include a series of straight lines, by explaining that the term “curve” in mathematics includes such a meaning); Imhaeuser, 101 U.S. (11 Otto) at 655, 657 (“Equivalents may be claimed” in an improvement invention; noting that the appeal was based on “Circuit Court err[or] in holding that the respondents have infringed the claims of the complainant’s patent”); Royer, 145 U.S. at 325 (if the patented invention was pioneering, it was entitled to a broader range of equivalents than those enumerated in the disclosure and “then the question, on a proper construction of the patent, whether the defendant’s
before Warner-Jenkinson had addressed the issue of the scope of an estoppel in regard to equivalents that were not embodiments of the amended claims. 76 Under the implied disclaimer cases, infringement could not be found for any equivalents that did not embody the narrowed claim, regardless of how broadly the amended language of that claim was construed. 77 The Court in Warner-Jenkinson thus properly selected the complete bar approach, given that the disclaimer resulting from a narrowing amendment is to be objectively determined and strictly construed. 78

Nevertheless, the Supreme Court in Festo held that the presumption of complete estoppel is rebuttable, and offered a rationale for why estoppel would not necessarily completely bar protection of all equivalents of the narrowed claim.

After amendment, as before, language remains an imperfect fit for invention. The narrowing amendment may demonstrate what the claim is not; but it may still fail to capture precisely what the claim is. There is no reason why a narrowing amendment should be deemed to relinquish equivalents unforeseeable at the time of the amendment and beyond a fair interpretation of what was surrendered. Nor is there any call to foreclose claims of equivalence for aspects of the invention that have only a peripheral relation to the reason the amendment was submitted. The amendment ... shows only that [the inventor] was familiar with the broader text [of the original claim] and with the difference between the two [claims]. 79

The Supreme Court’s rationale for adopting a presumption of estoppel, however, applies only to equivalents that are not (or were not) embodiments of the original claim. Only such extra-claim equivalents are outside of the difference between the two claims, and thus are outside of “the difference” that the inventor “was familiar with.” Equivalents within the scope of application of the original claim language constitute subject matter that the applicant has disclaimed and cannot seek to protect. Whether such equivalents also would be objectively foreseeable at the time of amendment (and thus dedicated to the public as well as impliedly disclaimed) is discussed below.

76 See Warner-Jenkinson Co. v. Hilton Davis Chem. Co., 520 U.S. 17, 21 (1997) (stating that Graver Tank “set out the modern contours of what is known as … the `doctrine of equivalents,’” which applies when “a product or process … does not literally infringe upon the express terms of a patent claim”).
77 See supra notes 69-70 and accompanying text.
78 See id.; Cybor Corp. v. FAS Techs., Inc., 138 F.3d 1448, 1457 (Fed. Cir. 1998) (en banc) (estoppel by amendment or argument is to be viewed objectively from the perspective of the reasonable competitor).
79 Festo, 535 U.S. at 738 (emphasis added). The Court adopted the general approach suggested by the United States and another amicus curiae. See Brief for the United States as Amicus Curiae Supporting Vacatur and Remand (Aug. 31, 2001), 2001 WL 1025650; Brief of The Institute of Electrical and Electronics Engineers -- United States of America as Amicus Curiae in Support of Neither Party (Aug. 31, 2001), 2001 WL 1025309.
80 Festo, 535 U.S. at 738.
Although the Supreme Court referred to the inventor, and although its opinion could be read to suggest a subjective test for determining a “fair interpretation of what was surrendered,” the Court later described the effect of the amendment in terms of “reasonableness.” The Court thus strongly (and properly) suggested that estoppel is to be viewed objectively. The only possible rationale for protecting equivalents excluded by amendment from an original claim that applied to such equivalents thus is a peripheral relation to the reason for the amendment. But even then, such equivalents are directly related to the effect of the amendment (whether or not they were intended by the applicant to be excluded). In sum, the new presumption of estoppel lacks justification, except in regard to equivalents that would not have embodied the original claim. And but for the modern doctrine of equivalents, such extra-claim equivalents (of both the original and the narrowed claim) would not receive patent protection.

3. Rebuttal of the Presumption of Complete Estoppel

The Supreme Court in Festo held that the new presumption of complete estoppel can be rebutted when: (1) the “equivalent may have been unforeseeable at the time of the application”; (2) “the rationale underlying the amendment may bear no more than a tangential relation to the equivalent”; or (3) “the patentee could not reasonably be expected to have described the insubstantial substitute.” Significantly, the Court also held that when “the patentee originally claimed the subject matter alleged to infringe but then narrowed the claim in response to a rejection, he may not argue that the surrendered territory comprised unforeseen subject matter that should be deemed equivalent.” The Court did not extend this limitation to the second and third rebuttal factors. However, the Court distinguished “the patentee's reason for making the amendment [from] the impact the amendment has on the subject matter.”

The rationale for a narrowing amendment thus should not matter to determining the extent of disclaimer and estoppel. Whatever the reasons were for making an amendment, they should not be viewed as peripheral if the amendment excluded the equivalents at issue from the scope of an original claim. Similarly, the original claim necessarily (even if generically) should be viewed as having “described the insubstantial substitute” under the third rebuttal factor, to the extent that the original claim encompassed subject matter directly applicable to the equivalent at issue. This is true even if the equivalent at issue constitutes non-obvious, later-arising substituted technology. Estoppel thus should apply under the third factor, unless (perhaps) the

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81 Id. at 740 (“the amendment cannot reasonably be viewed as surrendering a particular equivalent.”). See id. at 741 (“the patentee could not reasonably be expected to have described the insubstantial substitute”).

82 Id.

83 Id.

84 Id. at 741.

85 Id. at 733-34.

86 Festo, 535 U.S. at 736.

87 But cf. supra notes 43-45 (discussing the presumption of estoppel under Warner-Jenkinson Co. v. Hilton Davis Chem. Co., 520 U.S. 17, 30-33 (1997)).

88 Patents may claim broadly (and thus “block”) subsequently invented, patentably distinct (because novel and nonobvious) improvements of the original invention. See Robert P. Merges & Richard R. Nelson, On the Complex Economics of Patent Scope, 90 COLUM. L. REV. 839, 861 & n.96 (1990) (noting that “subservient” -- blocked -- patents are possible because the “dominant” patent’s disclosure is not inadequate by failing to describe specifically the nonobvious embodiments to which the dominant patent’s claims apply). Cf. Roton Barrier, Inc. v. Stanley Works, 79 F.3d 1112, (Fed. Cir. 1996) (Nies, J., additional views) (“A substitution in a patented inventiron
original claim was invalid and applied only generically to the equivalent at issue, and a more specific, otherwise valid claim applicable to the insubstantial substitute would have triggered a “new matter” rejection.\(^\text{89}\) But even then, the insubstantial substitute should not receive patent protection, as it would not have been disclosed.\(^\text{90}\) The basic premise of patent law is that inventions should receive protection only when disclosed, and that unclaimed, broader inventions are dedicated to the public if disclosed.\(^\text{91}\)

In regard to the first rebuttal factor, the Supreme Court’s statements strongly imply that foreseeability relates to legal claim drafting ability rather than to (or at least taking priority over) technological sophistication in the art. If the construed language of the original claim would have applied to the equivalent at issue, the equivalent cannot be considered unforeseeable. Similarly, the second and third rebuttal factors clearly relate to legal patent prosecution practices and to legal claim drafting ability, and should be understood objectively.\(^\text{92}\) Although the Court initially referred to the “patentee” when discussing the third factor, it later referred to the burden

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\(^{89}\) See 35 U.S.C. § 132(a) (2000) (“No amendment shall introduce new matter into the disclosure of the invention.”); Schering Corp. v. Amgen, 222 F.3d 1347, 1352 (Fed. Cir. 2000) (“the new matter prohibition is closely related to the adequate disclosure requirements of 35 U.S.C. § 112”) (citing Pennwalt Corp. v. Akzona Inc., 740 F.2d 1573, 1578 (Fed.Cir.1984)); Chiron Corp. v. Genetech, Inc., 363 F.3d 1247, 1255 (Fed. Cir. 2004) (discussing use of the written description requirement of § 112 to police the new matter restriction of § 132(a) since 1967) (citing In re Ruschig, 379 F.2d 990 (C.C.P.A. 1967)). Even if the original claim were invalid, the rationale for narrowing the claim would not be peripheral to the scope of application of the amended claim.

\(^{90}\) Cf. Chiron Corp., 363 F.3d at 1255 (noting the test for written description as “whether the disclosure of the application as originally filed reasonably conveys to the artisan that the inventor had possession” at the time of application; holding that applicants do not comply with written description requirements for claims that apply to later-arising technologies that “[d]o not even exist at the time of … application”) (quoting In re Kaslow,707 F.2d 1366, 1375 (Fed. Cir. 1983)).

\(^{91}\) See, e.g., 35 U.S.C. §§ 111, 112 (2000) (procedural and substantive requirements for specifications that disclose and claim the invention); Bonito Boats v. Thunder Craft Boats, Inc., 489 U.S. 141, 149 (1989) (patents are conditioned on the choice of “either secrecy or legal monopoly.”) (quoting Metallizing Eng’g Co. v. Kenyon Bearing & Auto Parts Co., 153 F.2d 516, 520 (2nd Cir. 1946)); Miller v. Bridgeport Brass Co.,104 U.S. (14 Otto) 350, 352 (1881) (omission of apparent, disclosed subject matter from claims is dedicated to the public, because it constitutes “a declaration that that which is not claimed is either not the patentee’s invention or” is intended to be dedicated); Johnson & Johnson Assocs. v. R.E. Serv. Co., 285 F.3d 1046, 1054-55 (Fed. Cir. 2002) (en banc) (applying the doctrine of equivalents to unclaimed subject would “conflict with the primacy of the claims in defining the scope of the patentee’s exclusive right.”) (quoting Sage Prods., Inc. v. Devon Indus., Inc., 126 F.3d 1420, 1424 (Fed. Cir. 1997)). See generally Edward C. Walterscheid, The Early Evolution of the United States Patent Law: Antecedents (Part 4), 78 J. PAT. & TRADEMARK OFF. SOC’y 77, 105-06 (1996) (the rationale ultimately adopted for the patent system was “to assure dissemination to the public of technical information which would otherwise be held in secrecy.”); Edward C. Walterscheid, The Early Evolution of the United States Patent Law: Antecedents (Part 3), 77 J. PAT. & TRADEMARK OFF. SOC’y 771, 797 (1995) (“the quid pro quo which the state receives for the patent grant is that enabling disclosure from which the public shall ultimately have the benefit.”); id. at 777-802, 849-50 (1995) (disclosure in a written specification became the required consideration for the grant of patent rights under English patent custom and developing common law prior to enactment of the U.S. Constitution).

on the patentee to show that “one skilled in the art” could not “reasonably” have drafted the relevant literal claim.\textsuperscript{93} Because estoppel should be viewed objectively, moreover, the patentee’s subjective understanding of the foreseeability of the equivalent, and the patentee’s rationale for the amendment and its claim drafting abilities should likely be excluded from evidence. Such testimony may be prejudicial and will be only remotely probative of the objective foreseeability of the equivalent, the objective reasons for or scope of the amendment, or the objective claim drafting ability in the art.\textsuperscript{94}

The claims in \textit{Festo} had been amended to add limitations during prosecution of the plaintiff’s two patents for magnetic rodless cylinders, \textit{i.e.}, conveying systems that contain a magnetized piston, a tube containing fluid, and an outer sleeve containing magnets and responding to movement of the piston. The amended claims added limitations for a pair of sealing rings with a lip on one side to block impurities from entering the tube and (in one patent) for the sleeve to be made of magnetizable material. The defendant’s competing cylinders used a single sealing ring with a two-way lip and a non-magnetizable aluminum sleeve.\textsuperscript{95} Although the defendant’s product embodied the original but not the amended claims,\textsuperscript{96} the District Court (on summary judgment) and the jury found equivalency to the amended claim limitations.\textsuperscript{97} The Federal Circuit panel originally and on remand from the Supreme Court following \textit{Warner-Jenkinson} affirmed the finding of equivalents infringement, holding that prosecution history estoppel did not apply.\textsuperscript{98} In contrast, the en banc Federal Circuit originally held that the amendments related to patentability, triggering prosecution history estoppel that completely barred application of the modern doctrine of equivalents.\textsuperscript{99} Although the Court held that estoppel presumptively applied, and stated that the limitations at issue were noted in the prosecution history and thus that “SMC may well prevail,” it failed to appreciate that the original claims would have applied to the equivalents. The Court thus remanded for the Federal Circuit

\begin{itemize}
\item \textsuperscript{93} \textit{Festo}, 535 U.S. at 741.
\item \textsuperscript{94} See Fed. R. Evid. 403 (2003) (“Although relevant, evidence may be excluded if its probative value is substantially outweighed by the danger of unfair prejudice, confusion of the issues, or misleading to the jury”).
\item \textsuperscript{95} See \textit{Festo}, 535 U.S. at 728-29; \textit{Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.}, 234 F.3d 558, 583 (Fed. Cir. 2000) (en banc), \textit{vacated} 535 U.S. 722 (2002). The first patent’s claims were amended following an initial rejection by the Patent Examiner. The second patent’s claims were added during a voluntary reexamination to consider additional prior art that the patentee had become aware of through foreign prosecution. See 234 F.3d at 564.
\item \textsuperscript{96} The District Court found that the defendant’s product did not directly infringe the claims, and the plaintiff did not appeal that holding. \textit{See id.} at 584.
\item \textsuperscript{97} \textit{Id.} at 578-79, 585. The district court found that the amendments were not made to avoid prior art. \textit{See id.} at 585.
\item \textsuperscript{98} The Federal Circuit had initially affirmed that holding and found no estoppel. \textit{See Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.}, 72 F.3d 857, 863-64 (Fed. Cir. 1995). On remand from the Supreme Court following the \textit{Warner-Jenkinson} decision, the Federal Circuit again affirmed and found no estoppel. \textit{See Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.}, 172 F.3d 1361, 1371-72, 1378-80 (Fed. Cir. 1999); \textit{Festo}, 234 F.3d at 579 n.3.
\item \textsuperscript{99} Festo had argued that the sealing rings limitation was added to comply with the disclosure requirements of section 112, first paragraph. \textit{See 35 U.S.C. § 112, ¶ 1} (2000). The en banc court also held for both patents that it was made to distinguish prior art. In contrast, it held that the magnetizable sleeve limitation was added without explanation and thus triggered the \textit{Warner-Jenkinson} presumption. \textit{See Festo}, 234 F.3d at 588-91. Festo conceded in the Supreme Court that both the sealing rings and non-magnetizable sleeve limitations were added to comply with disclosure requirements of 35 U.S.C. § 112 (2000), and thus for a reason relating to patentability, “if not also to avoid prior art.” \textit{Festo}, 535 U.S. at 737.
\end{itemize}
to determine how to apply the new rebuttable presumption.\textsuperscript{100}

C. Further Revised Reconciliation By the Federal Circuit In \textit{Festo}

On second remand from the Supreme Court in \textit{Festo},\textsuperscript{101} the en banc Federal Circuit further revised the Court’s revised reconciliation of prosecution history estoppel with the modern doctrine of equivalents. First, the Federal Circuit reiterated that prosecution history estoppel “may [be invoke[d]]” for “a narrowing amendment made to comply with any provision of the Patent Act.”\textsuperscript{102} Second, it held that a voluntary amendment may trigger estoppel.\textsuperscript{103} Third, it recognized that narrowing is “[t]he first question in a prosecution history estoppel inquiry,” but held that the \textit{Warner-Jenkinson} presumption continues to apply if the record “reveals no reason for the narrowing amendment.”\textsuperscript{104} Fourth, it held that both prosecution history estoppel and rebuttal of the \textit{Festo} presumption are questions of law for the judge – not the jury – to decide.\textsuperscript{105} Fifth, it revised and discussed what evidence is admissible in regard to the \textit{Festo} rebuttal factors.\textsuperscript{106}

In regard to the \textit{Warner-Jenkinson} presumption, the Federal Circuit further held that: (a) if an amendment “was not narrowing, then ... estoppel does not apply”; (b) if an amendment was narrowing, then in the absence of an explanation the \textit{Warner-Jenkinson} presumption applies to determining “whether the reason for that amendment was a substantial one relating to patentability”; and (c) if the \textit{Warner-Jenkinson} presumption is rebutted by “successfully establish[ing] that the amendment was not for a reason of patentability,” then estoppel does not apply.\textsuperscript{107} The Federal Circuit inconsistently held that the \textit{Warner-Jenkinson} presumption – arising from the absence of an explanation in the prosecution history – may be rebutted only by objective evidence in that same record.\textsuperscript{108}

In regard to the \textit{Festo} rebuttal factors, the Federal Circuit expanded the Supreme Court’s first factor by focusing on technological rather than linguistic foreseeability. Notwithstanding the Court’s direction that equivalents may not be argued to be unforeseeable when they were within the scope of the original claim,\textsuperscript{109} the Federal Circuit focused on (and likely revised the nature of) the person of ordinary skill in the art.\textsuperscript{110} Specifically, the Federal Circuit held that

\begin{itemize}
\item \textsuperscript{100} \textit{Id}. at 741-42.
\item \textsuperscript{102} \textit{Id}. at 1366.
\item \textsuperscript{103} \textit{See id}. at 1364, 1366.
\item \textsuperscript{104} \textit{Id}. at 1366, 1367.
\item \textsuperscript{105} \textit{See id}. at 1368-69 (citing \textit{Cybor Corp. v. FAS Techs., Inc.}, 138 F.3d 1448, 1460 (Fed.Cir.1998) (en banc)).
\item \textsuperscript{106} \textit{See id}. at 1368-70.
\item \textsuperscript{107} \textit{Id}. The Federal Circuit’s language was imprecise, and did not address either whether a “reason of patentability” is necessarily a “substantial” reason “relating to patentability” or (conversely) if such a reason is insubstantial then whether estoppel does not apply. \textit{Id}.
\item \textsuperscript{108} \textit{See id}. at 1367. \textit{See also Pioneer Magnetics, Inc. v. Micro Linear Corp.}, 330 F.3d 1352, 1356 (Fed. Cir. 2003) (refusing to consider an extra-record declaration in evaluating reasons for an amendment). The Federal Circuit did not explain how the objective evidence of record could both fail to explain whether the reasons substantially relate to patentability and provide a basis for rebutting that failure.
\item \textsuperscript{109} \textit{See supra} note 85 and accompanying text.
\item \textsuperscript{110} \textit{Cf}. \textit{id}. at 741 (discussing “one skilled in the art” in relation to reasonable ability to have drafted a directly
equivalents are “[u]sually” unforeseeable if the equivalent technology is “later-developed” or is “not known in the relevant art” at the time of amendment.\footnote{Festo, 344 F.3d at 1369. The Federal Circuit may have sought to protect patentees from impliedly disclaiming subject matter when they cannot reasonably foresee either the technologies that narrowing language restricts or changes to the meaning of such language over time. Cf. Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 535 U.S. 722, 738 (2002) (discussing a “fair interpretation” of what was surrendered).} “In contrast, old technology, while not always foreseeable, would more likely have been foreseeable.”\footnote{344 F.3d at 1369. See also id. (“Indeed, if the alleged equivalent were known in the prior art in the field of the invention, it certainly should have been foreseeable at the time of the amendment.”); Pioneer Magenetics, 330 F.3d at 1357 (prior art reference disclosed equivalent element, which was therefore foreseeable).} The Federal Circuit offered no data for its statement that later-arising technology is usually unforeseeable, without regard to the level of skill in the relevant art.\footnote{Foreseeability is not the same as obviousness of the later-arising technology, particularly as obviousness is determined as of the date of the later-arising technology. Cf. Johnson & Johnson Assocs. v. R.E. Serv. Co., 285 F.3d 1046, 1063 (Fed. Cir. 2002) (en banc) (Lourie, J., concurring) (criticizing the foreseeability standard for adding needless complexity if foreseeable is not identical with obviousness). Nor is foreseeability the same as implied disclosure of the later-arising technology, particularly as implied disclosure is determined as of the date of filing. See infra notes 126, 158 and accompanying text. The Patent Office and courts thus lack any data from which to determine if later-arising technology is usually unforeseeable, although the courts may develop such data after Festo. See Festo, 344 F.3d at 1369.} However, it properly limited proof of unforeseeability to objective evidence regarding “the state of the art and the understanding of a hypothetical person of ordinary skill in the art.”\footnote{See Festo, 344 F.3d at 1365 n.2 (noting conflicting language in the Supreme Court’s opinion that surrender is determined at the time of application and at the time of amendment) (citing Festo, 535 U.S. at 738, 740).} The Federal Circuit also reconciled the Supreme Court’s conflicting statements regarding the time at which foreseeability is to be determined, choosing the time of amendment.\footnote{Festo, 344 F.3d at 1369. See id. at 1369-70.}

In contrast, the Federal Circuit interpreted the Supreme Court’s second and third rebuttal factors narrowly. Tangentialness requires determining whether the reason for the amendment was either “peripheral” or “directly relevant” to the equivalent at issue.\footnote{See id. at 1365 n.2.} It is to be determined solely from the prosecution record, except for objective evidence of how one skilled in the art would interpret that record.\footnote{Id. at 1370.} The third (other reason) factor “must be a narrow one,” existing “in order not to totally foreclose” the patentee from providing a reason – “such as the shortcomings of language” – that the equivalent could not have been described when narrowing the claim.\footnote{Id. See id. at 1370-71.} Evidence of other reasons is to be limited “[w]hen at all possible” to the prosecution record.\footnote{Id. at 1370.} The Federal Circuit held that the plaintiff could not establish rebuttal of prosecution history estoppel on the second and third factors, but remanded to the district court (ten years after the trial) to determine whether the defendant’s technology was unforeseeable at the time of amendment.\footnote{See id. at 1370-71.}

In applying the first factor to the “magnetizable” sleeve material limitation added by amendment, the Federal Circuit held that factual issues regarding foreseeability required remand, applicable claim).
notwithstanding that the original claim would have applied and that “it seems unlikely that an aluminum sleeve would have been unforeseeable.”\textsuperscript{121} In applying the second factor, the Federal Circuit recognized that the lack of necessity for the limitation (to establish patentability) did not establish that reason for the amendment was peripheral. Nevertheless, the Federal Circuit failed to discuss the fact that the original claims would have applied to the equivalent at issue.\textsuperscript{122} In analyzing the third factor, the Federal Circuit appears to have taken judicial notice of the claim drafting skill in the art. The patentee “could have described the accused equivalent at various levels of specificity by using a common descriptive term such as ‘aluminum’ or ‘metal.’”\textsuperscript{123}

In regard to the sealing rings limitation, the Federal Circuit again remanded to determine “whether a person of ordinary skill in the art would have considered the accused two-way sealing ring to be an unforeseeable equivalent of the recited pair of sealing rings,” notwithstanding that the original claims would have directly applied.\textsuperscript{124} In regard to the second factor, the Federal Circuit rejected the possibility of finding the reasons for the amendments to be tangential, because in both patents the “amendments were made to distinguish prior art patents based, at least in part, on the ‘sealing ring’ aspect of the invention.”\textsuperscript{125} In regard to the third factor, the Federal Circuit again appears to have taken judicial notice of the lack of “other reasons” for failing to claim the equivalent, holding that a skilled claim drafter “could have encompassed SMC’s sealing ring by claiming, for example, ‘at least one sealing ring.’”\textsuperscript{126} However, the Federal Circuit finally recognized in this limited context that the “equivalent, would have fallen within the literal scope of the original claim, and Festo’s argument cannot succeed.”\textsuperscript{127}

The Federal Circuit and district courts will now repeatedly apply the en banc Federal Circuit’s revised reconciliation of prosecution history estoppel and the modern doctrine of equivalents, unless and until it revisits its holdings or the Supreme Court (in \textit{Festo} or another case) or Congress changes the law. Under the Federal Circuit’s approach, narrowing amendments that substantially relate to patentability (under \textit{Festo}) or are unexplained (under \textit{Warner-Jenkinson}) will presumptively trigger an estoppel of equivalents of the amended claim limitation. The burden will then shift to the patentee to rebut the presumption or the scope of the estoppel. The first \textit{Festo} factor may allow rebuttal for most later-arising and some existing equivalent technologies, by considering them to be unforeseeable at the time the amendment was made. The second and third \textit{Festo} factors should allow rebuttal for a much more limited number of foreseeable equivalent technologies. Although the Supreme Court held in Festo that technologies should not be considered unforeseeable equivalents when they would have embodied the original claims, the Federal Circuit held that such later-arising and existing technological embodiments may be unforeseeable equivalents to which the modern doctrine of equivalents will apply.

\section*{III. The Modern Doctrine and Temporal and Doctrinal Complexity}

\textsuperscript{121} \textit{Id.} at 1371.
\textsuperscript{122} See \textit{id.} at 1371-72.
\textsuperscript{123} \textit{Id.} at 1372.
\textsuperscript{124} \textit{Id.}
\textsuperscript{125} \textit{Id.} at 1373.
\textsuperscript{126} \textit{Id.}
\textsuperscript{127} \textit{Id.}
Although the Warner-Jenkinson and Festo decisions resolved some issues regarding the relation of the modern doctrine of equivalents to amended claim limitations, the Supreme Court and the Federal Circuit did not fully reconcile the modern doctrine with prosecution history estoppel and other doctrines that limit claim scope. To determine when estoppel arises, it is necessary to determine whether claim scope was narrowed by patentee actions. Complicating this judgment, the scope of application of original and amended claim meaning may vary over time. Even without narrowing, the failure to claim disclosed patentable subject matter will result in a dedication to the public that may preclude application of the modern doctrine of equivalents. The standard for dedication by unclaimed disclosure, however, is not identical to the Festo rebuttal standard of foreseeability, and is applied with reference to different time frames. Further, the standards for implied disclaimer of claim scope and estoppel of equivalents based on narrowing arguments also differ from the prosecution history estoppel standards established in Festo for narrowing amendments. Finally, the modern doctrine of equivalents is not supposed to protect what could not validly have been claimed, but the doctrinal standards that limit the scope of application of claims to potential future embodiments\(^{128}\) differ from the Festo rebuttal standard of foreseeability.

A. Estoppel By Narrowing Claims and Dedication By Unclaimed Disclosure

As discussed above, the Supreme Court in Warner-Jenkinson did not provide sufficient guidance regarding the reasons for amendment that avoid triggering prosecution history estoppel. The Court in Festo did not provide sufficient guidance regarding either the reasons that narrowing amendments avoid estoppel or how to determine narrowing. Because it focused on estoppel of equivalents, the Court in Festo also failed to discuss whether and when a narrowing amendment prevents a broadening construction of the amended claim limitation for direct infringement. The Court’s earlier cases, however, precluded a broader construction of the amended claim (or a narrower construction of the amending language) in infringement actions than it bore in the Patent Office.\(^{129}\) Construction of claims for direct application also should be a unitary determination that precludes a broadening construction after issuance.\(^{130}\) However broadly or narrowly the claim is later construed, the amendment either was or was not

\(^{128}\) See supra notes 27, 45-51 and accompanying text.

\(^{129}\) See supra notes 69-77 and accompanying text. In contrast, a narrower construction of the amended claim for direct infringement than in the PTO is permissible. The PTO’s gatekeeper role requires that it adopt the broadest reasonable construction of claim meaning at the time of filing, but judges are to construe the amended claim based on how it would most reasonably be viewed in the art in light of the prosecution history. See In re Morris, 127 F.3d 1048, 1054-55 (Fed. Cir. 1997) (discussing policy reasons for the different construction standards); supra notes 7-10 and accompanying text.

\(^{130}\) See, e.g., Amgen Inc. v. Hoechst Marion Roussel, Inc., ,314 F.3d 1313, 1330 (Fed. Cir. 2003) (“It is axiomatic that claims are construed the same way for both invalidity and infringement.”) (citing W.L. Gore & Assoc., Inc. v. Garlock, Inc., 842 F.2d 1275, 1279 (Fed.Cir.1988)). Cf. W.L. Gore & Assoc., 842 F.2d at 1279 (holding that law of the case applies to constructions for infringement following constructions for validity, except where “exceptional circumstances” apply such as when new evidence is considered)). It is also unitary for judgments as a matter of law and judgment based on jury verdicts, because juries play no role in claim construction. See Markman v. Westview Instruments, Inc., 517 U.S. 370, 378-91 (1996) (distinguishing claim construction from determining whether claims apply, and rejecting arguments that historic practice, precedent, or functional considerations support having judges construe claims generally but juries construe particular claim terms of art or trade meaning).
narrowing, and if it was narrowing it irrebuttably disclaimed the full scope of patentable subject matter that distinguishes the original and the amended claim. And without regard to amendment, a narrow construction that extends to less than the full patentable scope of expressly or impliedly disclosed invention dedicates to the public the unclaimed subject matter.

1. Narrowing of Claim Scope Over Time, With and Without Amendment

Determining the scope of implied disclaimer or dedication of subject matter effectuated by amended or original claims is complicated by changes in the scope of application of the relevant claim language over time. Although judges are supposed to construe claims for purposes of validity and for direct and equivalents infringement based on their meaning in the art at the time of filing, the applications of original meaning can expand (or contract) over time. For direct infringement, expansion of the scope of application of original claim meaning is currently limited only by the reverse doctrine of equivalents. The reverse doctrine (if and when applied) restricts claim scope and precludes infringement if “a device is so far changed in principle from a patented article that it performs the same or a similar function in a substantially different way, but nevertheless falls within the literal words of the claim.” Although courts also construe claim meaning at the time of filing when determining validity, the applications of the original meaning at the time of filing are fixed. An original or a narrowed claim limitation thus may expand its scope of application over time for purposes of direct infringement, so as to apply to later-arising technologies. Otherwise, there would be no need for the reverse doctrine.

Although construction of claim meaning by courts for validity and infringement is unitary, construction of claim meaning and application of that meaning differ. The Federal Circuit, however, has not always been careful to distinguish the two. In Chiron Corp. v.

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131 See supra note 10.


133 Graver Tank, 339 U.S. at 608-09. See Scripps Clinic Research Found. v. Genentech, Inc., 927 F.2d 1565, 1581 (Fed. Cir. 1991) (the reverse doctrine “prevent[s] unwarranted extension of the claims beyond a fair scope of the patentee’s invention”); Merges & Nelson, supra note 88, at 864 & n.113 (noting that use of the reverse doctrine “is fairly rare” and that the reverse doctrine “has never been applied by the Federal Circuit”)

134 See, e.g., Moba, B.V. v. Diamond Automation, Inc., 325 F.3d 1306, 1320 (Fed. Cir. 2003) (“compliance with § 112 has always required sufficient information in the original disclosure to show that the inventor possessed the invention at the time of the original filing.”) (citing Vas-Cath Inc. v. Mahurkar, 935 F.2d 1555, 1563 (Fed. Cir. 1991)); United States Steel Corp. v. Phillips Petroleum Co., 865 F.2d 1247, 1451-52, (Fed. Cir. 1989) (for enablement under 35 U.S.C. § 112, ¶ 1 (2000), “application sufficiency ... must be judged as of the filing date,” and “support need be found for only the claimed invention, in view of how one skilled in the art at that time would construe the claims and would read its specification”)(citing In re Glass, 492 F.2d 1228, 1232 (C.C.P.A. 1974); In re Hogan, 559 F.2d 595, 604 (C.C.P.A. 1977); In re Koller, 613 F.2d 819, 824 (C.C.P.A. 1977)).

135 In contrast, the Federal Circuit has been careful to distinguish between written description and enablement, holding repeatedly that 35 U.S.C. § 112, ¶ 1 includes a distinct requirement for a written description to “ensure that the scope of the right to exclude, as set forth in the claims, does not overreach the scope of the inventor’s contribution to the field of art as described in the patent specification.” University of Rochester v. G.D. Searle &
however, the Federal Circuit held that when a claim is interpreted (using the meaning applied at the time of filing) so as to apply to later-arising technology, it will be held invalid for lack of written description or lack of enablement. Specifically, the Federal Circuit distinguished between “nascent technology” and “technology that arises after the date of application,” holding that it is “impossible” for such later-arising technology to be enabled by a disclosure if it was “invented or developed after the filing date.” Similarly, the Federal Circuit held that such future technology would not meet the written description requirement, because it would not have been possessed by the inventor at the time of filing. The majority decision may have suggested that a unitary interpretation of the scope of application (as well as of the meaning of the claim) is required, when holding that claims that are construed to apply to future technologies will be invalid. Conversely, the concurrence warned against “hold[ing] that claims that are enabled by the original application may be construed broadly enough to encompass technology that is not developed until later and was not enabled by the original application,” in order to preserve validity of such claims. In an earlier case, the Federal Circuit had noted “the validity-infringement differentiation.”

Assuming that a unitary claim meaning may bear different interpretations of the range of its application for validity and infringement purposes (based on the different temporal reference points regarding knowledge in the art and the increased scope of embodiments to which the construed meaning will apply), the scope of linguistic meaning that is necessarily disclaimed by a narrowing amendment may not be identical to the scope of application of that meaning. The amended claim limitation may apply more or less broadly at the time of infringement than it would have been understood to apply at the time of filing or the time of amendment. Similarly, the scope of application of the original claim may apply more or less broadly at those different times, and thus the scope of application of the disclaimer effectuated by an amendment may vary

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136 363 F.3d 1247, 1254 (Fed. Cir. 2004).

137 Id. at 1254 (citing In re Hogan, 559 F.2d at 605-06); id. at 1256 (distinguishing “future technology” from “nascent technology”). Although the Federal Circuit did not define “nascent,” it appears to have meant existing technology that was not widely known or practiced in the relevant art. See Plant Genetic Sys., N.V. v. DeKalb Genetics Corp., 315 F.3d 1335, 1340 (Fed. Cir. 2003) (discussing technology that was “not an unknown concept that came into existence [at a later time, but at the time of application was] difficult to produce, and the … patent gave no instruction how”).

138 The Court did not, however, address broad or generic claims that might apply to later-arising technologies by blocking, rather than by specifically claiming them as patentable subject matter. See supra note 88 and accompanying text.

139 See Chiron Corp., 363 F.3d at 1254 (noting the need to “enable the full scope of a claimed invention” and avoiding the need to consider an alternative, narrower claim construction because the full claim was not enabled).

140 Id. at 1262 (Bryson, J., concurring). See id. at 1263 (recommending “where possible” that claims be construed “as they would have been understood by one of skill in the art at the time of invention,” to “preserve the benefits of patent protection for the invention that the applicant has actually conceived and enabled, without extending those benefits for an invention that the applicant may not have conceived and certainly has not enabled.”). Nevertheless, Judge Bryson may have implied that unitary construction is required, when noting that the Federal Circuit had “cautioned against using ‘the dicta from Hogan’ to ‘expand the coverage of claims, yet create a new, lower, standard of enablement’”). Id. (quoting Plant Genetic Sys., 315 F.3d at 1341).

141 Plant Genetic Sys., 315 F.3d at 1341. See Chiron Corp., 363 F.3d at 1257 (refusing to read its earlier holding in Plant Genetic Systems as requiring applications to enable future technology).
over time.\textsuperscript{142} Given a changing scope of application of claim meaning over time, an amendment may – at least in theory – be narrowing in its application at the time it was made but broadening at a later time.\textsuperscript{143} The Supreme Court in \textit{Festo} did not address these issues when stating that a narrowing amendment may disclaim patentable subject matter.

The Federal Circuit has provided a surfeit of guidance in regard to construing claims and evaluating amendments for direct application and (by extension) for modern doctrine of equivalents infringement.\textsuperscript{144} Claim language is to be construed from the objective, technological perspective of persons skilled in the art.\textsuperscript{145} Judges should consider numerous interpretive sources when construing claims,\textsuperscript{146} although the Federal Circuit has inconsistently emphasized the importance of different sources at different times.\textsuperscript{147} These sources include claim language,\textsuperscript{148} the specification,\textsuperscript{149} the prosecution history,\textsuperscript{150} dictionary definitions,\textsuperscript{151} and extrinsic evidence (such as expert testimony, inventor testimony, and publications) regarding how the amendment

\textsuperscript{142} For example, if the scope of application of a narrowed claim limitation grows over time, it may encompass at the time of infringement subject matter to which the original claim would not have applied at the time of filing, and to which both the original and the narrowed claim would not have applied at the time of amendment.

\textsuperscript{143} \textit{Cf. Schering Corp. v. Amgen}, 222 F.3d 1347, 1352-53 (Fed. Cir. 2000) (substitution of the more precise, later-arising term “IFN-α” for “leukocyte interferon” did not add new matter under 35 U.S.C. § 132(a) (2000) by extending application to “numerous polypeptides not discovered at the time of the patent application,” but only because the Court construed the amended limitation “to cover no more than what the specification supported at the time of filing”).

\textsuperscript{144} See generally Patent Litigation Comm., Am. Int. Prop. L. Assoc., Guide to the Interpretation of Patent Claims for the Judiciary (on file with the author). The Federal Circuit has not suggested that claim meaning and application may vary for direct and equivalents infringement, but the vitiation standard effectively accomplishes a similar expansion of claim scope (on a case-by-case basis, without stare decisis or collateral estoppel effect). See \textit{Markman v. Westview Instruments, Inc.}, 517 U.S. 370, 390-91 (1996) (discussing conditions under which claims interpretations will be binding on subsequent courts and parties); \textit{supra} note 176 and accompanying text; Sarnoff, \textit{supra} note 31, at _._._ (discussing substantive and procedural differences between non-literal claim construction and factual equivalency determinations). See generally Rachel M. Clark, Collateral Estoppel of Claim Interpretation After Markman, 86 MINN. L. REV. 1581 (2002).


\textsuperscript{146} See, e.g., Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1583-84 (Fed. Cir. 1996); \textit{Markman v. Westview Instruments, Inc.}, 52 F.3d 967, 979-80 (Fed. Cir. 1995) (en banc), aff’d, 517 U.S. 370 (1996).

\textsuperscript{147} See, e.g., Nard, \textit{supra} note 4, at 4-5 (discussing the predominant “hypertextualist” and the gradually emerging “pragmatic textualist” approaches to claim interpretation in the Federal Circuit). In addition, judges must determine when to apply the doctrine of “claim differentiation,” i.e., when different language in the claims should be interpreted to intend different meanings. See, e.g., \textit{Amgen Inc. v. Hoechst Marion Roussel, Inc.}, 314 F.3d 1313, 1326 (Fed.Cir.2003) (“doctrine of claim differentiation” imposes a rebuttable presumption that claims having different language are intended to have different scope); \textit{Comark Communications, Inc. v. Harris Corp.}, 156 F.3d 1182, 1187 (Fed.Cir.1998) (same).

\textsuperscript{148} See, e.g., Interactive Gift Express, \textit{Inc. v. Compusever Inc.}, 256 F.3d 1323, 1331 (Fed. Cir. 2001) (claim language most important).

\textsuperscript{149} See, e.g., Vitronics, 90 F.3d at 1582 (specification is the single best guide to disputed terms).

\textsuperscript{150} See, e.g., Southwall Techs., \textit{Inc. v. Cardinal IG Co.}, 54 F.3d 1570, 1578 (Fed. Cir. 1995) (ordinary meaning of claim terms is not used if from the file history “it appears” the terms were used differently).

\textsuperscript{151} See, e.g., \textit{Texas Digital Sys., Inc. v. Telegenix, Inc.}, 308 F.3d 1193, 1202-03 (Fed. Cir. 2002) (dictionaries may be the most meaningful sources of understanding terms, and if multiple dictionary definitions apply the claim should be interpreted broadly to include all such definitions). See generally Joseph S. Miller & James A. Hilsenteger, The Proven Key: Roles and Rules for Dictionaries at the Patent Office and the Courts, 7-43 (August 16, 2004), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=577262 (discussing dictionary choices in cases decided by the Federal Circuit and the effects of such choice on claim scope).
would have been understood in the art.\textsuperscript{152}

Like the Supreme Court in \textit{Festo}, the Federal Circuit has held that not all narrowing amendments will trigger an estoppel of equivalents protection.\textsuperscript{153} No “per se” rules exist to determine whether an amendment narrows (or broadens) an original claim.\textsuperscript{154} Instead, judges must evaluate the totality of evidence, determine whether the amendment was “material,” and construe what the language of the amendment means.\textsuperscript{155} The standard for determining whether an amendment is narrowing for doctrine of equivalents purposes is “[i]n harmony” with the standard for direct application.\textsuperscript{156} The language and the reasons for the amendment must be considered.\textsuperscript{157} The Federal Circuit, however, has inconsistently suggested that amended claims may not be given a broader scope of application over time than the applied meaning of original claims at the time of filing.\textsuperscript{158} The Federal Circuit has not resolved whether the amended claims should be further limited, by construing the meaning of the amended claim language at the (hypothetical) time of original claim filing or by limiting the scope of application to the applications within the (hypothetical) meaning at that time.

\textsuperscript{152} See, e.g., Dow Chem. Co. \textit{v. Sumitomo Chem. Co.}, 257 F.3d 1364, 1373 (Fed. Cir. 2001) (extrinsic evidence may be considered only “in the rare circumstance” that meaning is not clear from intrinsic evidence, and extrinsic evidence may not be used to “vary, contradict, expand, or limit” any implicit definition in the specification or file history).

\textsuperscript{153} See, e.g., \textit{Pall Corp. v. Micron Separations, Inc.}, 66 F.3d 1211, 1219-20 (Fed. Cir. 1995) (stating that different reasons for estoppel may lead to estoppels of varying or zero scope). See also \textit{Festo Corp. v. Shoketsu Kinzoku Kogyu Kabushiki Co.}, 522 U.S. 722, 736 (2002) (“may give rise to an estoppel”); \textit{Warner-Jenkinson Co.}, 520 U.S. at 33 (“limited set of reasons”).

\textsuperscript{154} See \textit{Laitram Corp. v. NEC Corp.}, 952 F.2d 1357, 1361-63 (Fed. Cir. 1991) (discussing amendments made in an ex parte reexamination proceeding under 35 U.S.C. §§ 304, 305 (2000)); \textit{id.} at 1360-61 (discussing protections against retroactive application of substantively different – not “identical” – claims that were amended during ex parte reexamination or during reissue) (citing 35 U.S.C. §§ 252, 307(b) (2000)). Because prosecution and examination are conducted in reexamination proceedings under the same standards as initial prosecution and examination, the same standards should apply to evaluating narrowing without reexamination. \textit{See id.} at 1360.

\textsuperscript{155} \textit{Andrew Corp. v. Gabriel Electronics, Inc.}, 847 F.2d 819, 824 (Fed. Cir. 1988). \textit{See Warner-Jenkinson Co. v. Hilton Davis Chem. Co.}, 520 U.S. 17, 32 (1997) (amendment became a “material element of the claim”); \textit{Laitram}, 952 F.2d at 1362 (rejecting the argument “that amendment following a rejection on prior art ‘clearly implies a change in coverage, i.e. a substantive change’”) (citation omitted). \textit{Cf. Laitram Corp. v. NEC Corp.}, 163 F.3d 1342, 1348 (Fed. Cir. 1998) (reiterating that there is no per se rule, but stating that “it is difficult to conceive of many situations in which the scope of a rejected claim that became allowable when amended is not substantively changed by the amendment.”).

\textsuperscript{156} \textit{Laitram}, 952 F.2d at 1362. \textit{See id.} at 1362-63 (“To determine whether a claim change is substantive it is necessary to analyze the original and the [amended claims] in light of the particular facts, including the prior art, the prosecution history, other claims, and any other pertinent information”).

\textsuperscript{157} \textit{See, e.g., Hi-Life Prods., Inc. v. Am. Nat. Water-Mattress Co.}, 842 F.2d 323, 325 (Fed. Cir. 1988) (“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”) (\textit{citing Hughes Aircraft Co. v. United States}, 717 F.2d 1351, 1363 (Fed. Cir. 1983)).

\textsuperscript{158} \textit{See, e.g., Schering Corp. v. Angen}, 222 F.3d 1347, 1353 (Fed. Cir. 2000) (“The term as used in the ... patent, however, did not and could not enlarge the scope of the patent to embrace technology arising after its filing.... [T]his court must determine what the term meant at the time the patentee filed the ... application.”). \textit{But see, e.g., Superguide Corp. v. DirecTV Enter. Inc.}, 358 F.3d 870, 880 (Fed. Cir. Feb. 12, 2004) (noting that the “law ‘does not require that an applicant describe in his specification every conceivable and possible future embodiment of his invention,’” when construing claims to apply to embodiments that did not exist at the time of filing, because the relevant limitation could be broadly construed to apply to technology of which skilled practitioners at the time of filing “knew of the existence”) (citation omitted).
Further, the Federal Circuit has held that prosecution history estoppel may arise even without amendment of the claims at issue. Estoppel applies to all claims in a patent containing the same limitations, even though such claims may not themselves have been amended. Similarly, prosecution history estoppel can arise from rewriting dependent claims in independent form, without any formal amendment to any of the claims in a patent. Patentees also may be estopped from asserting broader claim constructions or equivalents protection based on prosecution history in related applications, even though the disclaiming amendments or arguments were made after the patent in suit had issued.

2. Dedication and Predictability, Estoppel and Foreseeability

The Supreme Court in Festo implicitly recognized that public dedication (a form of implied disclaimer) necessarily results from failing to claim disclosed subject matter, when holding that equivalents within the scope of original but not amended claims cannot be considered unforeseeable equivalents. In earlier cases, the Court explicitly held that “the claim of a specific device or combination, and an omission to claim other devices or combinations apparent on the face of the patent, are, in law, a dedication to the public of that which is not claimed.” As discussed above, by amending the claim the patentee “proclaimed his abandonment of all that is embraced in that difference.” Thus, to the extent that disclosed (apparent or implicit) subject matter of the original claim was excluded from the narrowed claim,

159 See, e.g., Glaxo Wellcome, Inc. v. Impax Labs., Inc., 356 F.3d 1348, 1356-57 (Fed. Cir. 2004); Allen Eng’g Corp. v. Bartell Indus., Inc., 299 F.3d 1336, 1350 (Fed. Cir. 2002); Builders Concrete, Inc. v. Bremerton Concrete Prods. Co., 757 F.2d 255, 260 (Fed. Cir. 1985). Cf. Acco Brands, Inc. v. Micro Sec. Devices, Inc., 346 F.3d 1075, 1079 (Fed. Cir. 2003) (arguments made in regard to amended claim applied to similar language in unamended claim in the absence of statements to the contrary, and embodiments carried over from a parent and claimed in other patents did not broaden the scope of a divisional application).


161 See, e.g., Microsoft Corp. v. Multi-Tech Sys., Inc., 357 F.3d 1340, 1350 (Fed. Cir. 2004) (“a patentee’s statements during prosecution, whether relied on by the examiner or not, are relevant to claim interpretation.”) (distinguishing Georgia-Pacific Corp. v. United States Gypsum Co., 195 F.3d 1322, 1333 (Fed.Cir.1999)). Cf. GenzymeCorp. v. Transkaryotic Therapies, Inc., 346 F.3d 1094, 1103 (Fed. Cir. 2003) (amendment after final allowance could not be interpreted to broaden claims because it “could not negate th[e] extensive public record” and a broadening amendment could not have been accepted without applicant comment). But cf. Biogen, Inc. v. Berlex Laboratories, Inc., 318 F.3d 1132, 1141 (Fed. Cir. 2003) (“When the applicant is seeking different claims in a divisional application, estoppel generally does not arise from the prosecution of the parent.”); Goldenberg v. Cytogen, Inc., 373 F.3d 1158, 1166-67 (Fed. Cir. 2004) (holding that continuing applications may be considered in regard to applicant statements responding to double-patenting rejections, but should not rely on new matter of continuation-in-part applications to construe claims of earlier applications, and noting that Microsoft did not disturb the “narrow view” of when related applications are available to construe claims of earlier applications). The patentee in Microsoft had conceded in the trial court that it could not prove direct or equivalents infringement under the limited claim construction adopted in light of the subsequent prosecution history. See Microsoft, 357 F.3d at 1345.


the amendment necessarily and irrebuttably dedicated that subject matter to the public and disclaimed protection for it. However, the Court in Festo failed to recognize the necessity of such an implied disclaimer by dedication for narrowing amendments in regard to the second and third rebuttal factors. The Supreme Court’s holding in Festo thus was imprecise and unfortunate, and will result in doctrinal confusion, needless litigation, and increased patent protection at the public’s expense. 165

The Federal Circuit has provided additional guidance regarding the scope of implied disclaimer by public dedication of unclaimed, disclosed subject matter. In Johnson & Johnson Associates v. R.E. Service Co., 166 the en banc Federal Circuit recognized that failure to claim explicitly disclosed equivalents creates an implied-in-law dedication to the public that bars resort to the modern doctrine. 167 Since that time, the Federal Circuit has clarified that equivalents are barred to the extent that persons of ordinary skill in the art would be able to “identify the subject matter that had been disclosed and not claimed.” 168 Patentees thus may bar themselves from seeking equivalents protection without regard to estoppel by amendment, although a narrowing amendment may limit claims scope to further dedicate disclosed subject matter and that creates a prosecution history estoppel (and additional implied disclaimer) that bars patent protection.

In Festo, the Supreme Court did not clearly resolve the temporal frame in which to review amendments for estoppel. 169 Not all equivalents of a narrowed claim (viewed at the time of infringement) that are within the scope of application of an original claim (viewed at the time of infringement) would have been embodiments of the original claim (viewed at the time a narrowing amendment was made). Such equivalents would not have been “embraced” by the difference in the scope of application resulting from an amendment (viewed at the time of amendment). Alternatively, equivalents of the amended claim (viewed at the time of infringement) that were embodiments of both the original claim and the amended claim (viewed at the time of amendment) also would not have been embraced by the difference (viewed at the time of amendment). In either case, if disclaimer is viewed at the time of amendment, the amendment would not necessarily imply disclaim the excluded equivalents (although they may still be disclaimed by dedication). 170 Similarly, if disclaimer is viewed at the time of filing, the amendment would not necessarily disclaim excluded equivalents (and the amending language may not even have been invented at that time). 171 Conversely, if disclaimer is viewed strictly at

165 The imprecision was less than apparent, because the Court in its Festo opinion omitted the relevant language when quoting from Exhibit Supply. It also may reflect the current Justices’ reluctance to “strictly construe[disclaimers] against the inventor and in favor of the public,” particularly when the subject matter disclaimed is only impliedly disclosed. Sargent v. Hall Safe & Lock Co., 114 U.S. 63, 86 (1885). Johnson & Johnson Associates v. R.E. Serv. Co., 285 F.3d 1046, 1060-63 (Fed. Cir. 2002) (en banc) (Dyk, J., concurring) (arguing that dedication – or disclaimer – should be a form of conscious waiver of patent rights and that the absence of such a conscious waiver was the basis for the holding creating the modern doctrine of equivalents in Graver Tank).

166 285 F.3d 1046 (Fed. Cir. 2002) (en banc).

167 See id. at 1053-55 (citing, inter alia, Miller, 104 U.S. (14 Otto) at 352, and Mahn v. Harwood, 112 U.S. 354, 361 (1884)).

168 See supra notes 90-91 and accompanying text.

169 See supra notes 89, 143 and accompanying text.
the time of infringement, the amendment would disclaim the equivalents.

The Federal Circuit in Festo chose the time of amendment to determine foreseeability for rebuttal of estoppel by a narrowing amendment. But that choice makes sense only if the scope of application of claim meaning is fixed at that time. Further, the time of amendment for determining prosecution history estoppel differs from the times chosen for determining implied disclaimer by dedication. Subject matter is disclosed to the extent that it was identifiable to skilled practitioners at the time of filing, considering predictability in the art at that time. Disclosed subject matter is impliedly disclaimed by dedication if the claims (whether or not they were amended) do not apply to the subject matter (construed at the time of filing but applied at the time of infringement).

Predictability of the disclosure of an original claim’s embodiments, moreover, is not necessarily the same thing as foreseeability of the narrowed claim’s equivalents. Predictability of what is disclosed may be more strongly related to technological understanding of the invention, whereas foreseeability may more strongly relate to recognition and application of linguistic meaning. The difference reflects the different functions of disclosure (dedication) and estoppel (disclaimer). Disclosure provides support for the meaning of the claim (at the time of filing). Definitive meaning is needed to establish invention of the claimed invention by the inventor and immediate or ultimate dedication of the subject matter to the public, as well as to insure patentability over the prior art, enablement, and support for later-filed applications claiming temporal priority. In contrast, estoppel necessarily effects a disclaimer of claim scope at some time after original filing, and thus may be more focused on the meaning of the language than on the technological support for it.

The Federal Circuit has held that unclaimed equivalents will be disclaimed to the extent

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See supra notes 68-70, 132-34 and accompanying text.


See, e.g., Noelle v. Lederman, 355 F.3d 1343, 1348-50 (Fed. Cir. 2004) (citing Enzo Biochem v. Gen-Probe, Inc., 323 F.3d 956, 965 (Fed.Cir.2002), and Vas-Cath Inc. v. Mahurkar, 935 F.2d 1555, 1563-64 (Fed. Cir. 1991)); In re Gostelli, 872 F.2d 1008, 1012 (Fed. Cir. 1989). See also Rexnord Corp. v. Laitram Corp., 274 F.3d 1336, 1344 (Fed.Cir.2001) (patentee need not disclose all future embodiments); Utter v. Hiraga, 845 F.2d 993, 998 (Fed. Cir.1988) (written description need not describe “all species that [the] claim encompasses”). Although rare, in theory it is possible for subject matter to be implicitly disclosed based solely on generic descriptions or generic claims that are removed from the issued patent during prosecution. Such subject matter might be identified by skilled artisans in reviewing the issued patent’s narrower claims in light of its prosecution history.

Conversely, originally claimed but not impliedly disclosed subject matter cannot be dedicated by a narrowing amendment (unless the meaning of the disclosure also is allowed to expand over time).

There also may be differences in the objective legal and technological sophistication in the art in regard to which predictability and foreseeability are to be determined. See supra notes 92-94, 116-23 and accompanying text.

See, e.g., Amgen Inc. v. Hoechst Marion Roussel, Inc., 314 F.3d 1313, 1330 (Fed. Cir. 2003) (“The purpose of the written description requirement is to prevent an applicant from later asserting that he invented that which he did not; the applicant for a patent is therefore required to ‘recount his invention in such detail that his future claims can be determined to be encompassed within his original creation.’”) (quoting Vas-Cath Inc. v. Mahurkar, 935 F.2d 1555, 1561 (Fed. Cir. 1991)); Vas-Cath, at 1560-61 (historic reason for written description was both to place public in possession of the invention by enabling its use and to provide notice to the public of what was patented).

For this reason, the Federal Circuit properly chose the time of amendment rather than the time of filing. See supra note 115 and accompanying text.
that they were foreseeable at the time of filing, because the patentee should not receive protection for what it could foresee and thus could have disclosed and did not claim.\textsuperscript{179} Further, the Federal Circuit has held that patentees will be estopped from asserting doctrine of equivalents protection when the language of the amended claim necessarily excludes application to the equivalent, without regard to whether the technology was foreseeable.\textsuperscript{180}

Finally, whether or not the equivalents at issue constitute disclosed subject matter, if an amendment narrows original claim scope (viewed at the time of infringement) it should impliedly disclaim the difference in scope of application from the original claim (viewed at the time of infringement). Impliedly disclosed and originally claimed subject matter also may or may not have been patentable, because the standards for written description differ from those for enablement.\textsuperscript{181} But \textit{Festo} and earlier cases have held that a narrowing amendment forfeits the right to argue that additional subject matter within the scope of an original claim was patentable. By amending a claim to exclude either disclosed or undisclosed species (with disclosure viewed at the time of filing but exclusion viewed at the time of infringement), the patentee should forfeit the right to argue that the excluded subject matter either was patentable (at the time of filing) or was patented.\textsuperscript{182} Thus, all embodiments of an original claim (viewed at the time of infringement) that are excluded by a narrowing amendment (viewed at the time of infringement) should be denied patent protection. It is only the existence of the modern doctrine of equivalents that makes protection of such later-arising equivalents possible.

B. \textbf{Inconsistent Approaches to Amendment-Based and Argument-Based Estoppels}

\textsuperscript{179} See, e.g., \textit{Glaxo Wellcome, Inc. v. Impax Labs., Inc.}, 356 F.3d 1348, 1354-55 (Fed. Cir. 2004) (patentees must claim “readily known equivalents” at the time of application and cannot rebut the \textit{Festo} presumption by invoking failure to disclose such equivalents); \textit{Ranbaxy Pharms., Inc. v. Apotex, Inc.}, 350 F.3d 1235, 1241 (Fed. Cir. 2003) (known similar properties of chemical substitutes making them equivalent would also make claiming them foreseeable). Although understanding of the art normally progresses, equivalents that were foreseeable at the time of filing in rare circumstances may be unforeseeable at the time of amendment. Even then, the failure initially to disclose and claim the earlier-foreseeable equivalents should disclaim those equivalents. Further, the patentee should not receive protection for what it did not disclose, even if it could not foresee the equivalents (whether or not it had invented such a generally applicable principle). \textit{See supra} notes 91, 162-64 and accompanying text.

\textsuperscript{180} See, e.g., \textit{Senior Techs., Inc. v. R.F. Techs., Inc.}, 76 Fed. Appx. 318, 321 (Fed. Cir. 2003) (describing “binary choice” language, such as metallic and non-metallic); \textit{Ericsson, Inc. v. Harris Corp.}, 352 F.3d 1369, 1374-75 (Fed. Cir. 2003) (discussing claim language that inherently excludes “its very antithesis”) (\textit{citing Moore U.S.A., Inc., v. Standard Register Co.}, 229 F.3d 1091, 1106 (Fed. Cir. 2000)); \textit{SciMed Life Sys. v. Advanced Cardiovascular Sys., Inc.}, 242 F.3d 1337, 1346 (Fed. Cir. 2001) (excluding from equivalent protection any “plainly and necessarily excluded ... structural feature[s] ... opposite of the one recited in the claim”). The remands in \textit{Festo} thus appear unjustified, given that the relevant limitations used binary choice language, \textit{i.e.}, plural sealing rings and magnetizable metal.

\textsuperscript{181} See, e.g., \textit{Durel Corp. v. Osram Sylvania, Inc.}, 256 F.3d 1298, 1306 (Fed. Cir. 2001) (over-breadth for enablement is evaluated under the standard of “undue experimentation” at the time of filing); \textit{In re Wands}, 858 F.2d 731, 740 (Fed. Cir. 1988) (discussing factors to consider when determining enablement); \textit{In re Curtis}, 354 F.3d 1347, 1355 (Fed. Cir. 2004) (the disclosure must “clearly convey[] to one of skill in the art characteristics common to all species that explain how and why they make the invention operable.”) (\textit{citing In re Smythe}, 480 F.2d 1376, 1384 (C.C.P.A. 1973)). The Federal Circuit’s enablement standard is clearly more permissive than earlier Supreme Court precedent. \textit{See, e.g., The Incandescent Lamp Patent (Consolidated Electric Light Co. v. McKeesport Light Co.)}, 159 U.S. 465, 474 (1895) (“if the description be so vague and uncertain that no one can tell, except by independent experiments, how to construct the patented device, the patent is void.”).

\textsuperscript{182} \textit{See supra} notes 64, 158 and accompanying text.
The Federal Circuit’s approach to determining narrowing of claim scope or estoppel of equivalents by prosecution history arguments differs dramatically from its approach to prosecution history estoppel for amendments. In early cases, the Federal Circuit recognized that prosecution history estoppel can arise either from arguments or from amendments, both for direct application of claims and for doctrine of equivalents. For arguments, the Federal Circuit originally held that the same interpretive standards apply to evaluating whether claim scope was narrowed for direct application and equivalents estoppel. For direct application, “the test for determining the meaning of a claim term is from the vantage point of one skilled in the art.” In regard to equivalents, “the legal standard for determining what subject matter was relinquished is an objective one, 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.” Further, although it recognized the difference in terminology of its standards, “these formulations [are not] necessarily inconsistent – the point is the knowledge of one reasonably skilled in the art who views the question from the perspective of a competitor in the marketplace.”

1. The Reasonable Competitor’s Belief and Clear Statements of Disclaimer

In Cybor Corp. v. FAS Techs., Inc. the Federal Circuit en banc reinforced its earlier uniform approach to claim construction and prosecution history estoppel of equivalents by argument. Section 112, paragraph 6 of the Patent Act provides that “an element ... may be expressed as a means or step for performing a specified function without the recital of structure ... and such claims shall be construed to cover the corresponding structure ... described ... and equivalents thereof.” To be a “statutory equivalent” that embodies functional claim language, a product or process must identically perform the claimed function, but may do so in substantially the same way to accomplish substantially the same result. Thus, statutory equivalents are treated similarly to equivalents under the modern doctrine, except that such equivalents are treated similarly to equivalents under the modern doctrine, except that such
equivalents result from direct application of construed claim language, must perform the identical function claimed, and cannot include later-arising technologies.\textsuperscript{190} For both direct application as well as for argument-based estoppel of equivalents, the Federal Circuit held that “just as prosecution history estoppel may act to estop an equivalence argument under the doctrine of equivalents, positions taken before the PTO may bar an inconsistent position on claim construction under § 112, ¶ 6.’... The relevant inquiry is whether a competitor would reasonably believe that the applicant had surrendered the relevant subject matter.”\textsuperscript{191}

The Federal Circuit used dicta in \textit{Cybor} that could suggest that the competitor’s reasonable belief standard is not a substantive standard, but rather is the perspective from which to determine the existence of an implied disclaimer: “Clear assertions made in support of patentability thus may affect the range of equivalents under § 112, 6.”\textsuperscript{192} This dicta, however, was used to characterize the disclosure at issue and should not be understood to have imposed a new, more stringent “clear statement” rule that did not previously exist.\textsuperscript{193} The dicta do not logically preclude less than clear statements from being viewed as disclaimers, and immediately preceded the Federal Circuit’s explicit adoption of the competitor’s reasonable belief standard.\textsuperscript{194}

Recent Federal Circuit cases, however, have held that a patentee’s arguments will create a “prosecution disclaimer” precluding broad construction of claims for direct application only if the “disavowing actions or statements during prosecution [are] both clear and unmistakable.”\textsuperscript{195} Similarly, arguments will create an “argument-based estoppel” of equivalents protection only if the “the prosecution history ... evince[s] a ‘clear and unmistakable surrender of subject matter.’”\textsuperscript{196} The new standard thus raises the evidentiary bar for estoppel in favor of patentees. Rather than evaluate how competitors reasonably would view the evidence relevant to claim construction and prosecution history estoppel (viewed strictly against the patentee and in favor of the public), courts must now determine if competitors would reasonably find that the evidence suggests disclaimer so strongly that it clears an irrebuttable threshold.\textsuperscript{197}

\textsuperscript{190} See supra notes 42, 189 and accompanying text.
\textsuperscript{191} \textit{Cybor}, 138 F.3d at 1457 (quoting Alpex Computer Corp. v. Nintendo Co., 102 F.3d 1214, 1221 (Fed. Cir. 1996), and citing Insituform Techs., Inc., v. Cat Contracting, Inc., 99 F.3d 1098, 1107-08 (Fed.Cir.1996)). See id. at 1460 (“These arguments [for estoppel of equivalents under the modern doctrine] are unpersuasive for the same reasons that we rejected them under our § 112, ¶ 6 claim construction and literal infringement analysis.”).
\textsuperscript{192} Id. at 1457. See id. at 1460 (stating in dicta that the amendment failed to show a “deliberate, unequivocal surrender” of the full range of equivalents argued to be estopped under the doctrine of equivalents).
\textsuperscript{193} See generally William N. Eskridge, Jr. & Philip P. Frickey, \textit{Quasi-Constitutional Law: Clear Statement Rules As Constitutional Lawmaking}, 45 VAND. L. REV. 593 (1992) (discussing judicial lawmaking in the context of constitutional interpretation through imposition of clear statement rules). This reading of \textit{Cybor} improperly converts the court’s declarations regarding whether the specific statements did clearly disclaim scope into requirements for statements to clear disclaimer scope in order to qualify as disclaimers.
\textsuperscript{194} See id. at 1457.
\textsuperscript{195} \textit{Omega Eng’g, Inc. v. Raytek Corp.}, 334 F.3d 1314, 1326 (Fed.Cir.2003). See, e.g., \textit{Teleflex, Inc. v. Ficosa N. A. Corp., et al.}, 299 F.3d 1313, 1327 (Fed. Cir. 2002); \textit{Johnson Worldwide Assoc. v. Zebco Corp.}, 175 F.3d 985, 989-90 (Fed. Cir. 1999).

Nevertheless, whether a disclaimer has occurred should remain an objective inquiry rather than a subjective inquiry.
2. Amendment Presumptions and Argument Clear Statements

The Federal Circuit’s new argument-based estoppel standards conflict with the Supreme Court’s amendment-based estoppel standards in *Warner-Jenkinson*198 and *Festo*.199 According to the Supreme Court, amendments made for ambiguous reasons and narrowing amendments may now trigger a presumption of estoppel, which shifts the burden of rebuttal of implied-in-law disclaimer to the patentee. According to the Federal Circuit, however, only arguments that evidence a clear and unmistakable surrender of subject matter will estop a broader claim construction or equivalents protection, and in such cases there is no need for presumptions or rebuttal.200

The Federal Circuit has not articulated reasons to distinguish between amendments and arguments in regard to whether they narrow claim scope and impliedly disclaim patentable subject matter. In contrast, for broadening reissues, the Federal Circuit has recognized that “[a]rguments made to overcome prior art can equally evidence an admission sufficient to give rise to a finding of surrender.”201 The “clear and unmistakable” surrender standard, moreover, lacks any historic justification and divorces argument-based disclaimer standards from their earlier marriage to claim construction standards.202

Traced back through various cases, the Federal Circuit cites for origin of the clear and unmistakable surrender standard to *Hoganas AB v. Dresser Industries, Inc.*203 But *Hoganas* was the case that had articulated the competitor’s reasonable belief standard for estoppel of equivalents in the first instance, and that had explained that this standard it was consistent with the skill-in-the-art standard for claim construction. Specifically, in *Hoganas*, the Federal Circuit held that a “reasonable competitor could have concluded” that the examiner relied on a distinction argued by the patentee.204 The Federal Circuit’s dicta strongly implies that less than unmistakable clarity is required for a prosecution statement to reasonably be viewed as a

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200 If the argument were clearly (much less ambiguously) narrowing, it still might not clearly and unmistakably evidence a disclaimer by estoppel if a conscious waiver were required. See *Johnson & Johnson Assocs. v. R.E. Serv. Co.*, 285 F.3d 1046, 1060-63 (Fed. Cir. 2002) (en banc) (Dyk, J., concurring) (arguing that dedication by unclaimed disclosure was not decided by the Supreme Court in *Graver Tank & Mfg. Co. v. Linde Air Prods. Co.*, 339 U.S. 605 (1950), noting the lack of a clear disclosure of the equivalent at issue *Graver Tank*, and suggesting that invalid, overbroad claiming will not result in dedication); *supra* note 165 and accompanying text. However, the narrowing argument still would effectuate a dedication or disclaimer. *See supra* notes 162-68 and accompanying text. Conversely, if the estoppel were unmistakable, it could not be rebutted. See *Hester Indus., Inc. v. Stein, Inc.*, 142 F.3d 1472, 1481 (Fed. Cir. 1998).
202 9 F.3d 948 (Fed. Cir. 1993). *See, e.g., Omega Eng’g*, 334 F.3d at 1326 n.1 (citing *Litton Sys., Inc. v. Honeywell, Inc.*, 140 F.3d 1449, 1458 (Fed. Cir. 1998)); *Litton Sys.*, 140 F.3d at 1458 (citing *Hoganas AB*, 9 F.3d at 952). *Hoganas* also may be the source of the *Warner-Jenkinson* requirement that the doctrine of equivalents may not “entirely vitiate” the meaning of a claim limitation. *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 39 n.8 (1997); *Hoganas*, 9 F.3d at 955 (a “conclusion that a solid fiber is equivalent to a hollow ‘straw-shaped’ element would eviscerate the plain meaning of that phrase”).
203 *Hoganas*, 9 F.3d at 955 (emphasis added).
disclaimer. The “clear and unmistakable” surrender standard also is clearly and unmistakably in conflict with the Supreme Court’s earlier guidance requiring responses to Patent Office rejections to be strictly construed against patentees as – rather than in favor of patentees to avoid – disclaimers.\footnote{See supra notes 69-72 and accompanying text. Cf. Hoganas, 9 F.3d at 951 (noting that the court should not provide the patentee with a broader construction than the language the patentee drafted, even if adopted in error).}

The historical treatment of argument-based estoppels also provides no reason to distinguish them from amendment-based estoppels. Both derive from cases that reflect a unified approach to claim construction and implied disclaimer. In the 1870 Patent Act, Congress required patentees to “distinctly claim” the subject matter for which protection was sought.\footnote{See Act of July 8, 1870, ch. 230, § 26, 16 Stat. 198, 201 (currently codified at 35 U.S.C. § 112, ¶ 2 (2000)).} Shortly thereafter, the Supreme Court progressively prohibited patentees from “reclaiming” subject matter in broadening reissue patents that they had formally or had impliedly disclaimed. Estoppel necessarily resulted either from failing to claim subject matter during initial prosecution or from adopting narrowing amendments and arguments during such prosecution.\footnote{See, e.g., Leggett v. Avery, 101 U.S. (11 Otto) 256, 259-60 (1879); Goodyear Dental Vulcanite Co., 102 U.S. (12 Otto) at 228; Miller v. Bridgeport Brass Co., 104 U.S. (14 Otto) 350, 352 (1881); Mahn v. Harwood, 112 U.S. 354, 360-61 (1884).} The only exception was when an error or mistake had been made,\footnote{See, e.g., id. (“Nothing but a clear mistake, or inadvertence, and a speedy application for its correction, is admissible when it is sought merely to enlarge the claim.”).} permitting a broadening reissue so long as applied for without unreasonable delay (as determined by analogy to the grace period before a public use would place an invention in the public domain).\footnote{See, e.g., id. (“If two years' public enjoyment of an invention with the consent and allowance of the inventor is evidence of abandonment, and a bar to an application for a patent, a public disclaimer in the patent itself should be construed equally favorable to the public.”); Mahn, 112 U.S. at 363 (two year statutory bar is an “apposite” analogy but not a rule, because the bar to such reclaiming was then based on the equitable doctrine of laches). Cf. 35 U.S.C. § 251 ¶ 4 (2000) (current prohibition on enlargement of claims in reissues more than two years after the original grant); 35 U.S.C. § 102(b) (2000) (current public use bar of one year prior to application). But cf. supra note 200 and accompanying text.} Estoppel of broader protection was based on the patentee’s disclosure of subject matter, which created an implied-in-law dedication to the public of the unclaimed disclosed subject matter.\footnote{See, e.g., Miller, 104 U.S. (14 Otto) at 352.} \footnote{See, e.g., id. (“Nothing but a clear mistake, or inadvertence, and a speedy application for its correction, is admissible when it is sought merely to enlarge the claim.”).} The same implied-in-law disclaimer principles were later applied to patentee efforts to broaden claims of an original patent by construction in infringement actions.\footnote{See, e.g., Shepard v. Carrigan, 116 U.S. 593, 598 (1886) (“Under the circumstances of this case the inventor could not even get a reissue based on the broader claim which she had abandoned .... Much less can she, in a suit brought to restrain its infringement, enlarge her patent by argument so as to cover elements not falling within its terms, and which she had explicitly abandoned.”) (citing Leggett v. Avery, 101 U.S. (11 Otto) 256 (1879)). See generally Alexander, supra note 13, at 568-84 (tracing development of prosecution history estoppel in the Supreme Court from Leggett through Exhibit Supply Co. v. Ace Patents Corp., 315 U.S. 126 (1942)); John W. Schlicher, The Law, History, and Policy of Prosecution History Estoppel in Patent Actions in the U.S. Supreme Court -- Implications for Festo (Part I), 84 J. PAT. & TRADEMARK OFF. SOC’Y 581, 590-611 (2002) (discussing the history of and various ways to trigger prosecution history estoppel).} These cases established implied disclaimer as an objective result of narrowing claims, without regard to the applicant’s intent (except as relevant to a reissue with broader claims).\footnote{See, e.g., id. (“‘If two years' public enjoyment of an invention with the consent and allowance of the inventor is evidence of abandonment, and a bar to an application for a patent, a public disclaimer in the patent itself should be construed equally favorable to the public.’); Mahn, 112 U.S. at 363 (two year statutory bar is an “apposite” analogy but not a rule, because the bar to such reclaiming was then based on the equitable doctrine of laches). Cf. 35 U.S.C. § 251 ¶ 4 (2000) (current prohibition on enlargement of claims in reissues more than two years after the original grant); 35 U.S.C. § 102(b) (2000) (current public use bar of one year prior to application). But cf. supra note 200 and accompanying text.}}

\footnote{But cf. supra note 200 and accompanying text.}
C. Prior Art and Claim-Scope Limits To Equivalents Protection

In Wilson Sporting Goods Co. v. David Geoffrey & Assocs., the Federal Circuit explained that the modern doctrine of equivalents cannot provide protection for equivalents that were in the prior art when the patent was filed, and therefore could not validly have been claimed. In so holding, it clarified that the modern doctrine does not revise or enlarge the claims, but rather “expands the right to exclude to ‘equivalents’ of what is claimed.” The modern doctrine thus is limited by prior art neither because to do so would expand claims nor because it would allow the patentee to restrict goods that were previously in the public domain. Rather,

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. The doctrine of equivalents exists to prevent a fraud on a patent ... not to give a patentee something which he could not lawfully have obtained from the PTO had he tried.


To prevent the modern doctrine from being improperly applied to extend protection beyond the scope of claims that lawfully could have been obtained, the Federal Circuit in Wilson Sporting Goods adopted the methodology of hypothetical claim construction. By constructing a hypothetical claim of a sufficient breadth to directly apply to the defendant’s technology, the Court can assess whether equivalents protection would have been invalid because anticipated by or obvious in light of the prior art. If so, equivalents protection should be refused.

To avoid anticipation of a hypothetical (or real) claim, the prior art must not have expressly or inherently disclosed any single embodiment to skilled practitioners in the relevant field of invention, judged at the effective filing date of the hypothetical (or real) claim. To be inherent, the undisclosed feature need not have been recognized in the art at the time the reference was issued (or even at the time the claim was filed). Further, anticipation does not

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213 904 F.2d 677 (Fed. Cir. 1990).
214 See id. at 683-84. See also Talbert Fuel Systems Patents Co. v. Unocal Corp. 347 F.3d 1355, 1359 (Fed. Cir. 2003) (citing Pioneer Magnetics, Inc. v. Micro Linear Corp., 330 F.3d 1352, 1357 (Fed.Cir.2003)).
215 Wilson Sporting Goods, 904 F.2d at 684.
217 See id. at 684-85. Although the Federal Circuit has since stated that hypothetical claim construction is a helpful tool, it has not required district courts to use the methodology. See, e.g., Key Mfg. Group, Inc. v. Microdot, Inc., 925 F.2d 1444, 1449 (Fed. Cir. 1991).
218 Schering Corp. v. Geneva Pharm., 339 F.3d 1373, 1377 (Fed. Cir. 2003) (“holding that anticipation exists if “a single prior art reference discloses each and every limitation of the claimed invention .... Moreover, a prior art reference may anticipate without disclosing a feature of the claimed invention if that missing characteristic is necessarily present, or inherent, in the single anticipating reference”) (citing Lewmar Marine, Inc. v. Barent, Inc., 827 F.2d 744, 747 (Fed.Cir.1987), and Continental Can Co. v. Monsanto Co., 948 F.2d 1264, 1268 (Fed.Cir.1991)).
219 See Schering, 339 F.3d at 1377, 1379 (rejecting that inherent anticipation requires recognition, because inherent subject matter is in the public domain whether in its entirety or as a feature of an expressly disclosed invention; inherency is the “natural result flowing from’ the explicit disclosure of the prior art.”missing the first quotation mark) (quoting Eli Lilly & Co. v. Barr Labs., Inc., 251 F.3d 955, 970 (Fed.Cir.2001)). See Toro v. Deere & Co., 355 F.3d 1315, 1321 (Fed. Cir. 2004) (noting that a necessary feature or result of prior art embodiments that were described and enabled sufficiently to anticipate, “even if that fact was unknown at the time of the prior
require the actual creation or reduction to practice of the prior art subject matter, but only an enabling disclosure of the prior art subject matter that falls within the scope of the later claim.\footnote{See Schering, 339 F.3d at 1380 (citing \textit{In re Donohue}, 766 F.2d 531, 533 (Fed.Cir.1985)). For example, an “on-sale bar” will exist if a device was sold before creation of a physical embodiment, based on an enabling description that anticipated the claim (or rendered it obvious) “by its addition to the prior art.” \textit{Allen Eng’g Corp. v. Bartell Indus., Inc.}, 299 F.3d 1336, 1352, 1353 (Fed. Cir. 2002) (quoting \textit{Tec Air, Inc. v. Denso Mfg. Mich. Inc.}, 192 F.3d 1353, 1358 (Fed. Cir. 1999), and citing \textit{Pfaff v. Wells Elecs., Inc.}, 525 U.S. 55, 68-69 (1998)).} Thus, patents, publications, and other prior art\footnote{Various categories of prior art exist, applicable either before the invention by the applicant of the claimed subject matter or one year before filing of the claims. See 35 U.S.C. § 102(a)-(g) (2000).} may expand the scope of their disclosure after entering the public domain, based on increasing knowledge in the state of the art over time. The public domain therefore may include what is later enabled by the prior art disclosure (up to the effective filing date of the relevant hypothetical claim) and may include what is later recognized (even after the effective filing date of the hypothetical claim) to have been inherent in what was disclosed.

Prior art also may render a later-claimed invention obvious (and therefore unpatentable).\footnote{See supra notes 16-68, 179 and accompanying text.} Obviousness does not require explicit or inherent disclosure of each and every limitation of a claim in a single prior art reference. Rather, to render a claim obvious, there need only be “a motivation or suggestion to combine or modify prior art references, coupled with a reasonable expectation of success.”\footnote{Boehringer Ingelheim Vetmedica, Inc. v. Schering-Plough Corp., 320 F.3d 1339, 1354 (Fed. Cir. 2003) (citing \textit{Brown & Williamson Tobacco Corp. v. Philip Morris Inc.}, 229 F.3d 1120, 1124-25, 56 USPQ2d 1456, 1459 (Fed.Cir.2000)).} Unlike for anticipation, which requires either a reduction to practice or an enabling disclosure, the prior art references for obvious determinations need not have been enabling (even as to their own subject matter).

As discussed above, patentees may not seek to protect under the modern doctrine undisclosed equivalents of an invention that the patentee could foresee (at least by the time of filing) but did not ultimately claim.\footnote{See supra notes 16-68, 179 and accompanying text.} Such foreseeable equivalents are barred based either on a public dedication or on a failure of disclosure. But the equivalents also would be barred based on the holding in \textit{Wilson Sporting Goods}, to the extent they would have rendered the broadened claim anticipated or obvious in light of the relevant prior art (understood at the time of filing, and even later for what the prior art inherently disclosed). Conversely, unforeseeable equivalents to which the modern doctrine might apply may be anticipated or obvious in light of the patent’s own disclosure (viewed either at the time of filing or later, when the equivalents are created and...
knowledge in the art has expanded).\textsuperscript{225} If not anticipated or obvious, such unforeseeable equivalents may validly be claimed and become the subject matter of a “blocking patent,” \textit{i.e.}, a patentable improvement of an original invention to which the original patent applies.\textsuperscript{226} Blocking patents are possible because the scope of application of a fixed claim meaning may expand over time to embrace later-arising technologies, without invalidating the claim.\textsuperscript{227}

2. **Claim-Scope Doctrines and Later-Arising Equivalents**

Although the Federal Circuit focused on prior art prohibitions in \textit{Wilson Sporting Goods}, its reasoning is fully applicable to equivalents that could not be claimed under other “requirements of the Patent Act,” such as actual invention, regards-as-invention, written description, and enablement.\textsuperscript{228} Thus, for example, the Federal Circuit held in \textit{Smith-Kline Beecham Corp. v. Excel Pharms., Inc.},\textsuperscript{229} that a narrowing amendment made to overcome rejection of an overly broad (for lack of enablement), generic original claim surrendered from the narrowed claim all known species within the originally claimed genus (including undisclosed species that could not validly have been claimed), triggering the \textit{Festo} presumption of estoppel of equivalents protection.\textsuperscript{230} As the Federal Circuit noted, the “‘decision to forgo an appeal and submit an amended claim is taken as a concession that the invention as patented does not reach as far as the original claim.’”\textsuperscript{231}

Although the original claim at issue was found invalid by the Patent Office for lack of enablement, estoppel in theory should be triggered for any amendment to an original claim held invalid based on any claim-scope doctrine.\textsuperscript{232} Further, the estoppel should be irrebuttable, either because the amendment should be construed as what the inventor regards as the invention or based on historic standards for strictly construing disclaimers against the applicant.\textsuperscript{233} Nevertheless, given the \textit{Festo} rebuttal standards, the Federal Circuit remanded for the district court to determine whether the excluded equivalents were known substitutes at the time of filing (as thus were intentionally excluded from the original disclosure at the applicants risk, whether

\textsuperscript{225} See supra notes 109-15 and accompanying text.

\textsuperscript{226} See, e.g., Catalina Marketing International, Inc. v. Coolsavings.com, Inc., 289 F.3d 801, 809-10 (Fed. Cir. 2002) (blocking patents are common for new, nonobvious uses of disclosed structural inventions); \textit{Prima Tek II, L.L.C. v. A-Roo Co.}, 222 F.3d 1372, 1379 n.2 (Fed. Cir. 2000) (blocking patents are common for pioneer and improvement inventions); supra note 88. Cf. Merges & Nelson, supra note 88, at 909-11 (suggesting that both equivalents analysis under the modern doctrine and reverse equivalents consider the degree of improvement of the equivalent over the claimed invention, similarly to determining the permissible scope of broad claims for pioneering inventions).

\textsuperscript{227} See supra notes 131-43 and accompanying text.

\textsuperscript{228} \textit{Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.}, 535 U.S. 722, 740 (2002); supra notes 27, 61-63 and accompanying text.

\textsuperscript{229} 356 F.3d 1357 (Fed. Cir. 2004).


\textsuperscript{231} Id. (quoting \textit{Festo}, 535 U.S. at 734).

\textsuperscript{232} In theory, it should not matter whether the examiner or the applicant believed the original claim to be invalid, although determining the applicant’s belief may be difficult. See supra notes 63-64 and accompanying text.

\textsuperscript{233} See supra notes 51, 67-70 and accompanying text.
or not foreseeable at the time of amendment). The Federal Circuit also implicitly rejected a hypothetical claim approach, stating that the new matter prohibitions – which precluded claims drawn to the undisclosed equivalent species at issue – “are not directly germane” to the doctrine of equivalents and to estoppel for equivalents. The rationale of Smith-Kline is clearly in tension with that of Wilson Sporting Goods.

Further, the Federal Circuit in dicta suggested that “the quintessential example of an enforceable equivalent, after-arising technology, would always be unclaimable new matter. In that sense, the doctrine of equivalents compensates for the patentee’s inability to claim unforeseeable new matter.” The Federal Circuit’s statement fails to recognize that applicants may validly and generically claim and block unpredictable (even patently nonobvious) later-arising technologies, so long as the claim is properly described and enabled at the time of filing. Patentees also may unintentionally claim unforeseeable later-arising technologies (limited only by the reverse doctrine of equivalents), based on expansion of the scope of application of claims resulting from changes to the meaning of language and to skill in the art over time. Conversely, patentees may intentionally “prophetically claim” foreseeable later-arising technologies. And as a practical matter patentees may obtain overbroad claims that the

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234 See id. at 1364. The Federal Circuit distinguished Festo’s focus on knowledge of equivalency at the “time of amendment” as not addressing “the instance where the applicant could not properly claim a known equivalent … at the time of filing.” Although the Federal Circuit was focused on the inability to claim known equivalents on the filing date, the same should be true of unclaimable later-arising equivalents.

235 See Smith-Kline, 356 F.3d at 1364. But cf. Milcor Steel Co. v. George A. Fuller Co., 316 U.S. 143, 145-146 & n.3 (1942) (holding that disclaimers cannot add new matter and thereby claim narrower, previously unclaimed combinations, because “it is these claims, not the specifications, that afford the measure of grant to the patentee”).

236 Use of hypothetical claims in this context, however, is problematic, because the hypothetical claims are likely to be constructed more narrowly than would liberal or non-literal interpretations of the actual, narrowed claim language, and thus hypothetical claims are likely to be found valid more often than they should. See, e.g. Sarnoff, supra note 31, at - - (unlike hypothetical claims, actual constructions must anticipate subsequent applications); Katherine E. White, Festo: A Case Contravening the Convergence of Doctrine of Equivalence Jurisprudence in Germany, the United Kingdom, and the United States, 8 Mich. Telecomm. & Tech. L. Rev. 1, 31-32 (2002) (describing how the scope of hypothetical claims can vary and criticizing use of hypothetical claims that include elements that are literally infringed by the accused device or that include additional elements to the claim limitations); Henrik H. Parker, Doctrine of Equivalents Analysis After Wilson Sporting Goods: The Hypothetical Claim Hydra, 18 AIPLA Q. J. 262, 278-80 (1990) (describing differences in validity that depend on how hypothetical claims are drafted). This is true even without regard to whether hypothetical claims impermissibly add new matter.

237 Id.

238 See supra notes 88, 226 and accompanying text.

239 See supra notes 131-34 and accompanying text.

240 Prophetic claims may encompass future embodiments that have not been made or tested to be operable, so long as described in the present tense in the specification, because the inventor conceives of and (within the undue experimentation standard) enables the prophetic embodiments. See, e.g., Hoffmann-La Roche, Inc. v. Promega Corp., 323 F.3d 1354, 1368 n.1 (Fed. Cir. 2003) (disclosure and claiming of prophetic examples in the present tense does not constitute inequitable conduct) (citing Atlas Powder Co. v. E.I. du Pont De Nemours & Co., 750 F.2d 1569 (Fed. Cir. 1984)); Patent & Trademark Office, U.S. Dep’t of Commerce, Manual of Patent Examining Procedure ’608.01(p) (8th ed. 2003). Such prophetic claiming, however, may allow the “inventor to claim more than he has actually invented” and may block subsequent research. Mark J. Stewart, The Written Description Requirement of 35 U.S.C. § 112(1): The Standard After Regents of the University of California v. Eli Lilly & Co., 32 Ind. L. Rev. 537, 562 (1999).
Patent Office and infringers cannot prove are invalid.241

The Federal Circuit’s dicta in Smith-Kline that all later-arising equivalents would be unclaimable and should receive protection under the modern doctrine not only is wrong. It also unjustifiably extends the modern doctrine of equivalents to later-arising technologies that could not validly be claimed and should not receive protection under the rationale of Wilson Sporting Goods.242 Judge Rader, who authored Smith-Kline, provided no reason in that case why the patentee should be entitled to “compensation” for an inability to claim later-arising technology. In his initial en banc partial concurrence in Festo, however, Judge Rader explained that “[w]ithout a doctrine of equivalents, any claim drafted in current technological terms could be easily circumvented after the advent of an advance in technology.”243

The fact that a patent’s claims may be designed-around in the future, however, provides neither a doctrinal reason to extend protection beyond the claimed invention nor a demonstration that such additional protection would be fair.244 For the public, it may constitute an unwarranted restriction of the public domain. For the patentee, it may provide an unjust enrichment. As discussed in another article, some additional fairness or efficiency criterion would be required to justify protection for unclaimed or unclaimable later-arising equivalents.245 The argument for compensating the patentee thus may reflect only a common but unjustified hostility to narrow, improvement inventions that design around patent claims. 246

**CONCLUSION**

The Supreme Court and the Federal Circuit have created a complex, incoherent, and unnecessary doctrinal system for patent law in their treatment of the modern doctrine of equivalents, prosecution history estoppel, and related implied disclaimer and dedication

241 See In re Marzocchi, 439 F.2d 220, 223 (C.C.P.A. 1971) (the Patent Office must prove a lack of enablement before rejecting claims, based on objective reasons to reject an applicants’ statements regarding the adequacy of the description); Merges & Nelson, supra note 88, at 848-49 (discussing how evidence to demonstrate the lack of enablement of broad claims may arise only after further scientific discovery, and criticizing existing doctrine as going “too far” in allowing broad claims that often include later-arising embodiments that were not enabled).

242 Cf. In re Hogan, 559 F.2d at 609-11 (Miller, J., concurring-in-part) (criticizing temporal expansion of claims and reliance on the reverse doctrine to limit application to later-arising embodiments); Merges & Nelson, supra note 88, at 867 & n.120 (noting that effects on incentives for patentees are less in regard to doctrine of equivalents determinations where the degree of improvement is considered than for reverse doctrine of equivalents determinations where the claims directly apply).


244 Cf. Liebel-Flarsheim Co. v. Medrad, Inc., 358 F.3d 898, 911 (Fed. Cir. Feb. 11, 2004) (“the court has ‘admonished against judicial rewriting of claims to preserve validity.’”) (quoting Rhine v. Casio, Inc., 183 F.3d 1342, 1345 (Fed. Cir. 1999)).

245 See Sarnoff, supra note 31, at ___-__ (criticizing fairness and efficiency arguments supplied by the Supreme Court to support the modern doctrine of equivalents).

doctrines. In particular, the Court and the Federal Circuit have improperly extended patent protection under the modern doctrine to later-arising equivalent technologies that could not validly have been claimed. Although these doctrines can be undone, it is important in the meantime to understand and appreciate their workings. As a result, the public can better recognize the scope of issued patents, patent applicants can better avoid the adverse consequences resulting from application of the doctrines, and judges, legislators, and the public can better appreciate the need for doctrinal reform. "Knowledge is power," and change is inevitable.  

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247 THE NEW DICTIONARY OF CULTURAL LITERACY 52 (E.D. Hirsch Jr. et al. eds., 3d ed. 2002) (quoting Francis Bacon). See id. ("The more one knows, the more one will be able to control events").