

# **United States Court of Appeals for the Federal Circuit**

05-1492

FESTO CORPORATION,

Plaintiff-Appellant,

v.

SHOKETSU KINZOKU KOGYO KABUSHIKI CO., LTD.,  
(also known as SMC Corporation)  
and SMC PNEUMATICS, INC.

Defendants-Appellees.

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Appealed from: United States District Court for the District of Massachusetts

Judge Patti B. Saris

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DECIDED: July 5, 2007

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Before MICHEL, Chief Judge, NEWMAN, and DYK, Circuit Judges.

Opinion for the court filed by Circuit Judge DYK. Dissenting opinion filed by Circuit Judge NEWMAN.

DYK, Circuit Judge.

This case raises the question of whether an equivalent is foreseeable within the meaning of Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 535 U.S. 722, 740 (2001) (“Festo VIII”), and subject to surrender under the doctrine of prosecution history estoppel. We conclude that foreseeability does not require the applicant to be aware that a particular equivalent would satisfy the insubstantial differences test or the function/way/result test with respect to the claim as amended. We hold that Shoketsu Kinzoku Kogyo Kabushiki Co., Ltd. and SMC Pneumatics, Inc.’s (collectively “SMC”)

aluminum sleeve was a foreseeable alternative to Festo Corporation's ("Festo's") magnetizable sleeve and that prosecution history estoppel applies. Accordingly, we affirm the district court's judgment in favor of SMC of lack of infringement of U.S. Patent No. 4,354,125 (filed May 28, 1980) ("125 patent"). Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., No. 88-1814, slip op. at 2 (D. Mass. June 13, 2005) ("Festo XI"); Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., Ltd., slip op. 88-1814, p.7 (D. Mass. Jan. 10, 2006) ("Festo XII") (order denying motion to amend judgment).

## BACKGROUND

### I

This case once again presents an issue concerning the scope of prosecution history estoppel under the doctrine of equivalents. The case has been pending for almost twenty years and has been before the Supreme Court twice and before us twice en banc. The relevant history may be briefly summarized.

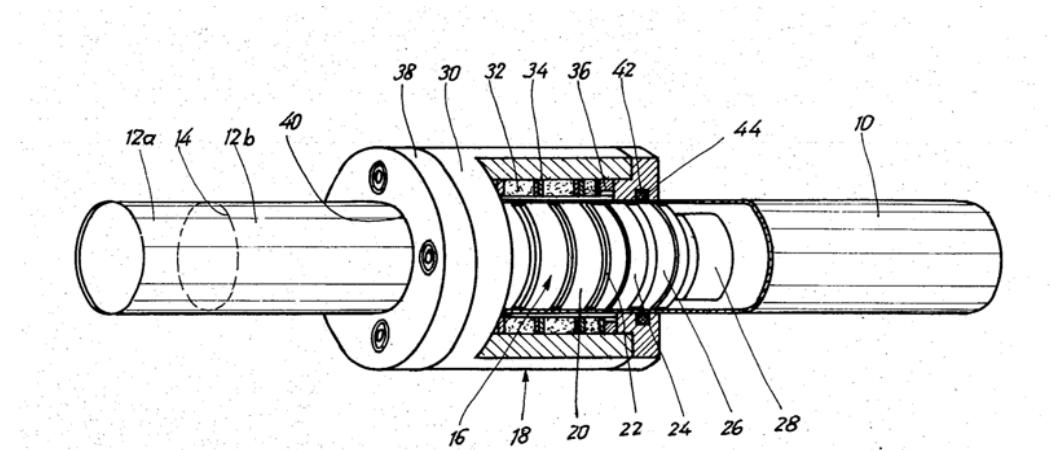
In August 1988, Festo sued SMC for infringement of the '125 patent.<sup>1</sup> The '125 patent, entitled "Magnetically Coupled Arrangement for a Driving and a Driven Member," claims a "small gap" magnetically coupled rodless cylinder. A "magnetically coupled rodless cylinder" is a previously known device that contains a piston that is forced through a cylinder and is magnetically coupled to a driven member or driven assembly (which is then attached to a carriage that can move goods). '125 patent Abstract; id., col.1 ll.11-15. Thus, when the piston moves through the cylinder, the magnetic force moves the driven member, which moves the attached carriage. At the time of the

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<sup>1</sup> Festo's original lawsuit also charged SMC with infringing U.S. Patent No. 3,779,401 (filed Feb. 17, 1972) ("the Carroll patent"). The Carroll patent was not at issue before the district court on remand and is not at issue in this appeal.

invention, such conveyance machines were known in the art. The invention claimed in the '125 patent is a “small gap” magnetically coupled rodless cylinder, meaning that the gap between the piston and the driven member is kept as small as possible so that the magnetic coupling force is particularly strong. '125 patent Abstract.

The patent explains that the piston is encircled with magnets and is driven through the cylinder by liquid pressure. Id., col.1 ll.56-58, col.2 ll.12-13. The driven member is outside the cylinder and contains magnets that are coupled by magnetic force with the magnets on the piston. Id., col.3 ll.16-17, col.4 ll.25-29. The driven member is not physically attached to the piston, but, because it is magnetically coupled to the piston, the driven member follows the piston along the outside of the cylinder as the piston moves along the inside of the cylinder. A “sleeve” surrounds the outside of the driven member and is the casing that encloses the magnets. Id., col.3 ll.60-65. Guide rings are located at each end of the piston. Id., col.3 ll.24-30. The purpose of the guide rings is to guide the piston through the cylinder without the magnets on the piston touching the sides of the cylinder. The guide rings also wipe impurities from the inside of the cylinder. Id., col.3 ll.41-48. The device also contains sealing rings at either end of the piston. Id., col.3 ll.30-33. The purpose of the sealing rings is to align with separate wiping rings on the driven member to prevent “torsional deforming moments” that could cause the piston and the driven member to pinch the thin cylinder wall. Id., col.1 ll.63-68. The sealing rings also wipe impurities from the inside of the cylinder. Id., col.3 ll.41-48. The following figure, the only drawing in the patent, shows the cylinder (10), the piston (16), the driven member (18), the guide rings (24), the sealing rings (26), the wiper rings (44), and the sleeve (30):



Dr. Kurt Stoll filed the application that became the '125 patent in the United States as the U.S. counterpart to a German patent application. The original U.S. application was filed with 12 claims. Claim 1 initially read:

1. A linear motor for use in a conveying system, said motor being operable by a pressure medium and comprising a tubular part connectible to a source of the pressure medium, a piston which is slidable in said tubular part and which has sealing means at each end for [w]iping engagement with an internal surface of the tubular part and so as to form a seal for the pressure medium, and a driven assembly which is slidable on the tubular part and which has means at each end for [w]iping engagement with an external surface of the tubular part, the piston and the driven assembly each carrying a drive magnet arrangement in the form of a hollow cylindrical assembly, each magnet arrangement having radial play relative to the adjacent surface of the tubular part, and surfaces of the magnet arrangements which face the tubular part being closely adjacent to the respective surfaces of the tubular part.

Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 234 F.3d 558, 582 (Fed. Cir. 2000) (en banc) (vacated on other grounds, Festo VIII, 535 U.S. at 742).

The original application also included two relevant dependent claims: claims 4 and 8. Claim 4 read:

4. A linear motor according to any of claims 1 to 3, wherein the sealing means of the piston comprise sealing rings and the piston is provided with sliding guide rings near the sealing rings.

Id. at 583 (emphasis omitted). Claim 8 read:

8. A linear motor according to any of the preceding claims wherein the driven assembly is provided with a sleeve made of a magnetizable material, which encircles the hollow cylindrical assembly of the magnet arrangement.

Id. (emphasis omitted).

In 1981 the patent examiner rejected the initial application because the examiner could not determine whether the claimed device was a “true motor or [a] magnetic clutch”<sup>2</sup> and because some of the claims were in improper multiple dependent form in violation of 35 U.S.C. § 112.

In response, on November 2, 1981, Dr. Stoll submitted two prior art German patents that claimed a “large gap” rodless cylinder, meaning that the gap between the magnets on the piston and driven member is larger than the gap claimed in the ’125 patent. See German Offenlegungsschrift No. 27 37 924 (“the German patent”); German Gebrauchsmuster No. 19 82 379. These patents had been cited in the first office action in Dr. Stoll’s corresponding German application and were called to the examiner’s attention here as possibly relevant prior art. The German patent identified a sleeve “made of non-magnetic material.” The German patent also identified two sealing rings, one located at each end of the piston, but no guide rings. In an accompanying response, Dr. Stoll did not address the sleeve element but did state that “[i]t is clear that neither of these two references discloses the use of structure preventing the

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<sup>2</sup> A “motor” is defined as a “prime mover,” which is “[a]n engine or mechanism converting a natural source of energy into mechanical power.” G.H.F. Nayler, Dictionary of Mechanical Engineering 252, 297 (4th ed. 1996). A “clutch” is “[t]he coupling of two working parts, for example two shafts, in such a way as to permit connection or disconnection at will without the necessity of bringing both parts to rest, and when connected to transmit the required amount of power without slip.” Id. at 78. A “magnetic clutch[]’ make[s] use of the attraction of a magnet for its armature.” Id.

interference by impurities located inside the tube and on the outside of the tube while the arrangement is moved along the tube."

Dr. Stoll also amended the patent application. He replaced independent claim 1 and dependent claims 4 and 8 with a new independent claim (now claim 1 of the '125 patent).<sup>3</sup> The new independent claim claims "a cylindrical sleeve made of a magnetizable material." '125 patent col.6 ll.2-3. While the original claim did not refer specifically to a "sleeve," the specification makes clear that a sleeve was part of the

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<sup>3</sup> The full text of the new amended claim 1 reads:

In an arrangement having a hollow cylindrical tube and driving and driven members movable thereon for conveying articles, the improvement comprising wherein said tube is made of a nonmagnetic material, wherein said driving member is a piston movably mounted on the inside of said tube, said piston having a piston body and plural axially spaced, first permanent annular magnets encircling said piston body, said piston further including first means spacing said first permanent magnets in said axial spaced relation, the radially peripheral surface of said magnets being oriented close to the internal wall surface of said tube, said piston further including plural guide ring means encircling said piston body and slidingly engaging said internal wall and first sealing rings located axially outside said guide rings for wiping said internal wall as said piston moves along said tube to thereby cause any impurities that may be present in said tube to be pushed along said tube so that said first annular magnets will be free of interference from said impurities, wherein said driven member includes a cylindrical sleeve made of a magnetizable material and encircles said tube, said sleeve having plural axially spaced second permanent annular magnets affixed thereto and in magnetically attracting relation to said first permanent annular magnets and second means spacing said second permanent annular magnets in said axially spaced relation, the radially inner surface of said magnets being oriented close to the external surface of said tube, said sleeve having end face means with second sealing rings located axially outside said second permanent annular magnets for wiping the external wall surface of said tube as said driven member is moved along said tube in response to a driving movement of said piston to thereby cause any impurities that may be present on said tube to be pushed along said tube so that said second permanent annular magnets will be free of interference from said impurities.

'125 patent col.5 l.23 – col.6 l.18 (emphases added).

driven assembly. The specification explains that the sleeve “encloses” the magnets on the driven assembly and the magnets are “bolted to the sleeve by way of elastomeric thrust rings.” ‘125 patent col.3 ll.62-68. Thus the amendment adding “a cylindrical sleeve made of a magnetizable material” in claim 1 affected “the composition of the sleeve.” Festo VIII, 535 U.S. at 737.<sup>4</sup> The amendments also replaced “sealing means” in the original claim with “first sealing rings located axially outside said guide rings.” ‘125 patent col.5 ll.37-38. The purposes of the amendments were not explained. After considering Dr. Stoll’s response, the examiner allowed the amended claims with minor changes that are not pertinent here.

SMC’s accused device is also a magnetically coupled rodless cylinder containing a piston, cylinder, and driven member. However, the SMC device contains two relevant differences. First, the sleeve on the driven member is made of a non-magnetizable material, aluminum alloy. Second, while the SMC device contains two guide rings (one on each end of the driven member), it only uses one sealing ring. The parties agreed that the accused device does not literally infringe the ‘125 patent because it does not satisfy either of these two claim limitations. Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., Ltd., No. 88-1814, slip op. at \*3, \*6 (D. Mass. Feb. 3, 1994).

Festo argued, however, in a motion for summary judgment that the device infringed under the doctrine of equivalents. Id. SMC, in turn, argued in a cross-motion for summary judgment that the accused device did not infringe under the doctrine of equivalents because it did not satisfy the function/way/result test (i.e., that it was not insubstantially different) and because the two amendments to the claims invoked the

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<sup>4</sup> Moreover, the sleeve is clearly depicted as part of the driven assembly in the only drawing in the patent. ‘125 patent FIGURE.

doctrine of prosecution history estoppel. Id. The district court held that prosecution history estoppel did not apply because “there [was] nothing in the record . . . to indicate that the limitation of a magnetizable sleeve was necessary to distinguish the claimed invention over the prior art.” Id. at \*4. At the same time the court concluded that whether there was infringement under the doctrine of equivalents was a question of fact to be heard by a jury. Id. at \*5. After hearing evidence on the function/way/result test, the jury found infringement of claim 1 of the ’125 patent under doctrine of equivalents and awarded Festo \$4,322,456 in damages and \$416,727 in pre-judgment interest. The district court entered judgment accordingly. Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., Ltd., No. 88-1814 (D. Mass Oct. 27, 1994) (“Festo I”).

After an initial panel decision affirming the judgment, Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 72 F.3d 857 (Fed. Cir. 1995) (“Festo II”), the Supreme Court granted certiorari and remanded for consideration of the prosecution history estoppel question in light of Warner-Jenkinson Co. v. Hilton Davis Chemical Co., 520 U.S. 17 (1997). Shoketsu Kinzoku Kogyo Kabushiki Co., Ltd. v. Festo Corp., 520 U.S. 1111 (1997) (“Festo III”). We considered the question en banc and held that the amendments were presumed to be related to patentability and therefore created an absolute bar to the invocation of the doctrine of equivalents. Festo VI, 234 F.3d at 574, 587-91.<sup>5</sup> The Supreme Court again vacated and remanded, holding that an amendment did not raise a complete bar, and that there were three exceptions, namely

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<sup>5</sup> On the first remand from the Supreme Court, a panel of this court vacated and remanded the district court’s judgment of infringement of the ’125 patent under the doctrine of equivalents. Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 172 F.3d 1361, 1381 (Fed. Cir. 1999) (“Festo IV”). We then granted SMC’s petition for rehearing en banc. Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 187 F.3d 1381 (Fed. Cir. 1999) (“Festo V”).

that (1) the equivalent was “unforeseeable at the time of the application,” (2) “the rationale underlying the amendment [bears] no more than a tangential relation to the equivalent in question,” or (3) that “some other reason suggest[s] that the patentee could not reasonably be expected to have described the insubstantial substitute in question.” Festo VIII, 535 U.S. at 740-41.

In our second en banc, we held that rebuttal of the presumption of surrender was a question of law to be tried by a court and not a jury. Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 344 F.3d 1359, 1367 (Fed. Cir. 2003) (en banc) (“Festo X”). We explained that the latter two exceptions were legal questions to be determined based on the prosecution history and that neither exception applied. Id. at 1369-70. With respect to the first exception (foreseeability), we concluded that it too was a legal question but held that, because “[b]y its very nature[] objective unforeseeability depends on underlying factual issues,” district courts may hear expert testimony and consider other evidence relating to the foreseeability analysis. Id. at 1369. As no record on the issue of foreseeability had been made in the earlier district court proceeding, we remanded for the district court to determine: (1) “whether an ordinarily skilled artisan would have thought an aluminum sleeve to be an unforeseeable equivalent of a magnetizable sleeve in the context of the invention”; and (2) “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.” Id. at 1371-72.

On remand, the district court received evidence on the foreseeability issue during a two-day bench trial. Festo argued that neither an aluminum sleeve nor a single two-way sealing ring was foreseeable on the date of the amendment, November 2, 1981.

Festo urged that it was not foreseeable at the time of the amendments that the equivalents could perform the same function as the Festo device (even though Festo had successfully argued in the doctrine of equivalents trial that the equivalents in fact performed the same function). Festo Post Tr. Br. at 12, 32 (Jan. 7, 2005). Based on the patent specification, Festo argued that a purpose of the sleeve was to shield against magnetic field leakage; while aluminum was well known, its utility to provide magnetic field shielding was unknown and that its use for that purpose was unforeseeable at the time of the amendment. Regarding the sealing rings, Festo argued that a person of ordinary skill in the art would not have foreseen the SMC structure as “a design option” because a skilled artisan would have thought that removing a ring would (1) allow impurities to enter the gap and (2) result in deformation of the tube.

After the trial, the district court issued an order dated June 13, 2005, finding that Festo failed to rebut the presumption for either the magnetizable sleeve or the sealing rings. Festo XI, at 2. The court then issued a subsequent January 10, 2006, order affirming its original decision and denying Festo’s motion to amend the judgment. Festo XII, at 7. Regarding the magnetizable sleeve, while the court stated that “no one disputes that the use of an aluminum alloy sleeve for purposes of shielding magnetic fields was not known at the time of amendment,” Festo XII, at 2, the court concluded that use of an aluminum alloy sleeve was foreseeable because the leakage fields on the Festo device were “very small.” Id. at 3. In other words, the district court appeared to find that use of an aluminum sleeve was foreseeable because containing the magnetic leakage fields was not necessary to serve the purposes of the invention. The court explained that “[t]he evidence suggests that a person of ordinary skill in the art, at most,

would have considered a device with a non-magnetizable sleeve inferior. However, as with the single sealing ring, inferiority does not equate with unforeseeability.” Festo XI, at 20.

Regarding the sealing rings, in its June 13, 2005, opinion, the district court held that use of a single sealing ring was foreseeable relying primarily on its misunderstanding that the German patent only claimed a single sealing ring. Festo XI, at 12. The court concluded that “[b]ecause a single sealing ring was known in the prior art in the field of the invention, it certainly should have been foreseeable.” Id. at 13 (internal quotation marks omitted).

On January 10, 2006, the district court denied Festo’s motion to amend but clarified its description of the German patent. Festo XII, at 4. While the court recognized that the German patent in fact claimed two sealing rings, the court nonetheless found that a single sealing ring was foreseeable. Festo had argued that use of a single sealing ring was not foreseeable at the time of amendment in 1981 because the strength of magnets at that time required the cylinder wall to be sufficiently thin to allow a strong magnetic connection. By 1988, Festo argued, magnet technology had improved which permitted the use of thicker cylinder walls. These thicker walls were not as susceptible to deformation if an asymmetrical set of sealing rings was used. Festo thus alleged that use of a single sealing ring was not foreseeable in 1981 because a person of ordinary skill in the art could not have foreseen the developments in magnet technology. The district court concluded that “Festo’s primary failing was the lack of data comparing the strength of the magnets in the art in 1981 (the time of amendment) vis-à-vis the magnets in the SMC device.” Id. at 6. The court reasoned

that without this data it could not credit Festo's expert testimony "concerning the [lack of] foreseeability of using one two-way sealing ring with two guide rings as an equivalent to the Festo combination to prevent torsional deformation in 1981." Id. at 7.

Festo timely appealed to this court. We have jurisdiction pursuant to 28 U.S.C. § 1295(a)(1) (2006).

## DISCUSSION

Prosecution history estoppel as a limit on the doctrine of equivalents is an issue of law which is reviewed without deference. Festo X, 344 F.3d at 1367-68. We review the resolution of underlying factual issues for clear error. See id. at 1369.

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In Graver Tank & Manufacturing Co. v. Linde Air Products Co., 339 U.S. 605 (1950), the Supreme Court stated that the doctrine of equivalents applies when the equivalent represents an "insubstantial" change from the claim language. Id. at 610. The Court also explained that "a patentee may invoke [the] doctrine [of equivalents] to proceed against the producer of a device 'if it performs substantially the same function in substantially the same way to obtain the same result.'" Id. at 608 (quoting Sanitary Refrigerator Co. v. Winters, 280 U.S. 30, 42 (1929)). The Supreme Court in Warner-Jenkinson Co. v. Hilton Davis Chemical Co., 520 U.S. 17 (1997), considered whether the test for the doctrine of equivalents should be the "insubstantial differences" test or the "triple identity" test, which focuses on "the function served by a particular claim element, the way that element serves that function, and the result thus obtained by that element." Id. at 39 (emphasis in original). The Court declined to choose one test

because “[d]ifferent linguistic frameworks may be more suitable to different cases, depending on their particular facts.” Id. at 40.

The doctrine of prosecution history estoppel acts as a “legal limitation on the doctrine of equivalents.” Id. at 30. “[P]rosecution history estoppel limits the range of equivalents available to a patentee by preventing recapture of subject matter surrendered during prosecution of the patent.” Southwall Techs., Inc. v. Cardinal IG Co., 54 F.3d 1570, 1579 (Fed. Cir. 1995). The burden is on the patentee to establish that the reason for the amendment was unrelated to patentability. Warner-Jenkinson, 520 U.S at 33. If the patentee fails to meet this burden, the court must presume that the patentee “had a substantial reason related to patentability for including the limiting element added by amendment.” Id. If there is a substantial reason related to patentability “prosecution history estoppel would bar the application of the doctrine of equivalents as to that element.” Id. However, in Festo VIII, 535 U.S. at 740, the Supreme Court held that the patentee may prove that the amendment did not surrender the particular equivalent by demonstrating that one of three exceptions is met.

The Supreme Court’s decision in Festo VIII established that the purpose of the amendments to the original claims of the application ultimately issuing as the ’125 patent was to overcome a Section 112 rejection, and therefore “the amendments were made for a reason relating to patentability.” Id. at 741. Our decision in Festo X also established that the “tangential” and “some other reason” exceptions are inapplicable. 344 F.3d at 1372-73. Here the sole question is whether the equivalent was “unforeseeable at the time of the application.” Festo VIII, 535 U.S. at 740-41. On remand from the Supreme Court, we concluded that “unforeseeable at the time of the

amendment” meant “whether the alleged equivalent would have been unforeseeable to one of ordinary skill in the art at the time of the amendment.” Festo X, 344 F.3d at 1369. We noted that later-developed technology or technology that was not known in the pertinent prior art was “usually” not foreseeable. Id. However, we explained that “old technology, while not always foreseeable, would more likely have been foreseeable. 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.” Id.

We have explained that the Supreme Court in Festo VIII “ties foreseeability to whether the applicant would have been expected to know of, and thus properly claim, the proposed equivalent at the time of amendment.” SmithKline Beecham Corp. v. Excel Pharms., Inc., 356 F.3d 1357, 1364 (Fed. Cir. 2004). Thus “the Supreme Court in Festo [does not] excuse[] an applicant from failing to claim ‘readily known equivalents’ at the time of application.” Id. Accordingly, we have consistently held that an equivalent is foreseeable when the equivalent is known in the pertinent prior art at the time of amendment. For example, in Amgen Inc. v. Hoechst Marion Roussel, Inc., 457 F.3d 1293, 1313 (Fed. Cir. 2006), we found that the patentee failed to establish a lack of foreseeability where “the patentee admittedly knew about the . . . equivalent at the time of the . . . amendment” and informed the examiner of the equivalent during prosecution.<sup>6</sup>

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<sup>6</sup> See also, e.g., Cross Med. Prods., Inc. v. Medtronic Sofamor Danek, Inc., 480 F.3d 1335, 1342 (Fed. Cir. 2007) (“[T]he evidence of record clearly demonstrates that the use of an undercut or recess, the alleged equivalent here, is an old and well known fundamental of basic machining that was entirely foreseeable at the time of the amendment to one of ordinary skill in the art.”); Research Plastics, Inc. v. Fed.

II

Previously both the Supreme Court and our court expressed skepticism that Festo could prevail on the issue of foreseeability. In remanding, the Supreme Court noted that “SMC may well prevail, for the sealing rings and the composition of the sleeve both were noted expressly in the prosecution history.” Festo VIII, 535 U.S. at 741. So too when we remanded to the district court we noted that “it seems unlikely that an aluminum sleeve would have been unforeseeable, as it was made of a commonly available metal.” Festo X, 344 F.3d at 1371.

Festo urges, however, that these suggestions are wide of the mark. Relying on language in Festo X that foreseeability must be determined “in the context of the invention,” id., Festo contends that the equivalent must be foreseeable under the function/way/result test at the time of the amendment. In support of its position, Festo argues that

[t]he proper unforesightability test is to determine whether the proven equivalent would have been foreseeable to a person of ordinary skill in the art to accomplish the claimed invention, i.e., perform the same function in

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Packaging Corp., 421 F.3d 1290, 1299 (Fed. Cir. 2005) (“[I]t was foreseeable at the time of issuance of the patent that [the equivalent] was a point of differentiation.”); Glaxo Wellcome, Inc. v. Impax Labs., Inc., 356 F.3d 1348, 1355 (Fed. Cir. 2004) (finding that the patentee failed to rebut the presumption because “Glaxo was aware of these potential hydrogel equivalents at the time of submitting the ’798 patent claims and later amending those claims to recite only HPMC”); Ranbaxy Pharm. Inc. v. Apotex, Inc., 350 F.3d 1235, 1241 (Fed. Cir. 2003) (finding that the equivalent was foreseeable where the equivalent was “readily known by chemists”); Talbert Fuel Sys. Patents Co. v. Unocal Corp., 347 F.3d 1355, 1359 (Fed. Cir. 2003) (“When the prior art embraces the alleged equivalent, and a narrowing amendment was made to avoid that equivalent, that subject matter cannot be found to have been unforeseeable at the time of the amendment.”); Pioneer Magnetics, Inc. v. Micro Linear Corp., 330 F.3d 1352, 1357 (Fed. Cir. 2003) (holding that the patentee could not overcome the presumption of prosecution history estoppel because the equivalent technology was “known in the art and would have been foreseeable at the time of the amendment”).

substantially the same way to achieve the same result, looking only at the information available at the time of the amendment.

Appellant's Reply Br. at 8.<sup>7</sup> Festo argues that that use of an aluminum alloy sleeve was not foreseeable on November 2, 1981, the date of amendment, because it was not known that an aluminum alloy sleeve would perform the magnetic shielding function. Festo also alleges that use of one sealing ring was not foreseeable because in 1981 one would reasonably expect that a single sealing ring would result in deformation of the cylinder and that, therefore, the sealing function could not be performed by a single sealing ring.

We disagree that the foreseeability test requires application of the function/way/result or insubstantial differences test. Rather, we find that an alternative is foreseeable if it is disclosed in the pertinent prior art in the field of the invention. In other words, an alternative is foreseeable if it is known in the field of the invention as reflected in the claim scope before amendment. We have no occasion here to determine in what other circumstances an equivalent might be foreseeable.

### III

As an initial matter, we note that Festo's argument seems inconsistent with the basic concept of the doctrine of equivalents. Festo is effectively arguing that it should be able to capture the unclaimed equivalents here because at the time the patent was prosecuted those equivalents were unknown and the device incorporating those equivalents was thought to be substantially different from the device with the features

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<sup>7</sup> Similarly Festo urges that “[t]he issue to be decided is whether a person of ordinary skill in the art could have foreseen the use of the SMC aluminum alloy sleeve in place of the claimed magnetizable sleeve to accomplish the same function, in substantially the same way to achieve the same result.” Appellant's Reply Br. at 8-9.

claimed in the patent before the amendment. In other words, Festo argues that a patentee should be able to capture through equivalents a device that was novel, i.e. separately patentable, because of the novelty of the equivalent features. The theory of the doctrine of equivalents is that an applicant through the doctrine of equivalents should only be able to protect the scope of his invention, Wilson Sporting Goods Co. v. David Geoffrey & Assocs., 904 F.2d 677, 684 (Fed. Cir. 1990), not to expand the protectable scope of the claimed invention to cover a new and unclaimed invention. We have not directly decided whether a device—novel and separately patentable because of the incorporation of an equivalent feature—may be captured by the doctrine of equivalents, although we have held that when a device that incorporates the purported equivalent is in fact the subject of a separate patent, a finding of equivalency, while perhaps not necessarily legally foreclosed,<sup>8</sup> is at least considerably more difficult to make out.<sup>9</sup> But there is a strong argument that an equivalent cannot be both non-obvious and insubstantial.<sup>10</sup>

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<sup>8</sup> See Glaxo Wellcome, Inc. v. Andrx Pharm., Inc., 344 F.3d 1226, 1233 (Fed. Cir. 2003) (“Although this fact may be weighed by the district court, particularly if there is an issue of ‘insubstantial’ change with respect to equivalency, separate patentability does not automatically negate infringement.”); Hoechst Celanese Corp. v. BP Chem. Ltd., 78 F.3d 1575, 1582 (Fed. Cir. 1996); Nat'l Presto Indus., Inc. v. West Bend Co., 76 F.3d 1185, 1191 (Fed. Cir. 1996) (“The grant of a separate patent on the accused device does not automatically avoid infringement, either literal or by equivalents.”); Atlas Powder Co. v. E.I. DuPont de Nemours and Co., 750 F.2d 1569, 1580 (Fed. Cir. 1984) (rejecting the *prima facie* standard).

<sup>9</sup> In Hoganas AB v. Dresser Industries, Inc., 9 F.3d 948 (Fed. Cir. 1993), this court held that the accused product was not insubstantially different from the patented device. Id. at 954. In support of this holding, the court noted that the accused device was separately patented. Id. We explained that “the PTO must have considered the accused product to be nonobvious with respect to the patented composition. Accordingly, the issuance of that patent is relevant to the equivalence issue.” Id. Likewise, in Zygo Corp. v. Wyko Corp., 79 F.3d 1563 (Fed. Cir. 1996), we stated that

Even if we were to assume that Festo's argument was consistent with the purpose of the doctrine of equivalents, we conclude that, contrary to Festo's argument, the foreseeability requirement does not require the knowledge that the equivalent would satisfy the function/way/result test or the insubstantial differences test.

#### IV

Neither the Supreme Court's Festo VIII decision nor our own 2003 en banc decision in Festo X in any way supports Festo's theory. To the contrary, both the Supreme Court's decision and our en banc decision make clear that an equivalent is foreseeable if the equivalent was generally known to those skilled in the art at the time of amendment as available in the field of the invention as defined by the pre-amendment claim scope. The applicant is charged with surrender of foreseeable equivalents known before the amendment, not equivalents known after the amendment. Thus, for example, the Supreme Court in Festo VIII noted that "[t]he patentee, as the author of the claim language, may be expected to draft claims encompassing readily known equivalents." 535 U.S. at 740. Similarly we stated in Festo X that "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." 344 F.3d at 1369 (emphasis added).

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the accused device is "presumed nonobvious" when it is patented, and "[t]he nonobviousness . . . is relevant to the issue of whether the change therein is substantial." Id. at 1570.

<sup>10</sup> See Roton Barrier, Inc. v. Stanley Works, 79 F.3d 1112, 1128 (1996) (Nies, J., additional views) ("A substitution in a patented invention cannot be both nonobvious and insubstantial.").)

Festo also offers no persuasive theory as to why the function/way/result test applied to the claims as amended should be used to determine foreseeability. To adopt Festo's argument, in fact, makes no sense. First, the function/way/result or insubstantial differences test is designed to determine whether the alternative is sufficiently close to the claimed feature that the patentee should be able to capture the equivalent and bar its use by a competitor. The test is not designed to determine whether prosecution history estoppel applies as a result of a limiting amendment. Festo offers no rationale for importing a test designed for one purpose into an entirely different context.

Second, accepting Festo's view of foreseeability would likely eliminate prosecution history estoppel as a restriction on the doctrine of equivalents in most cases. See Warner-Jenkinson, 520 U.S. at 30. Prosecution history estoppel would apply only if the applicant in adopting the narrowing amendment was aware or should have been aware that the equivalent would be an equivalent to the claimed feature for purposes of the invention as defined by the amended claim. This in itself would be rare, and it would be rarer still that the applicant, aware of such an alternative, would have failed to claim it in the first instance. An alternative would be foreseeable only in the limited circumstances where the alternative was inadvertently omitted and was a candidate for a reissue patent. See 35 U.S.C. § 251.

Third, since the only difference between the function/way/result test for infringement and Festo's test for prosecution history estoppel is the difference in timing—the function/way/result test for infringement being applied at the time of infringement and the function/way/result test for prosecution history estoppel being

applied at the time of amendment—Festo’s proposed test would lead to endless bickering over whether the equivalent satisfied the function/way/result test. It would also lead to inconsistent arguments, as the record in this case amply attests. For purposes of infringement, the patentee would assert that it was clear beyond question that the unclaimed feature served the identical function in the same way and achieved the same result as the claimed feature, and the accused infringer would argue the opposite. The roles would then be reversed on the issue of prosecution history estoppel with the patentee arguing that no one skilled in the art could possibly have foreseen the alternative as equivalent, and the accused infringer arguing that it was clear at the time of amendment that the equivalent satisfied the function/way/result test. For example, here the district court did not credit one of Festo’s experts because he changed his testimony between the 1994 trial on infringement and the 2004 trial on foreseeability. See Festo XI, at 17 (“Dr. Wolf was not persuasive in his testimony that a two-way sealing ring would have rendered the Festo device a failure. Indeed, he testified to the contrary in the 1994 trial.” (internal citations omitted)).

Finally, and most important, Festo’s test focuses on the wrong claim. The question is not whether after the narrowing amendment the alternative was a known equivalent, but rather whether it was a known equivalent before the narrowing amendment. The purpose of an amendment typically is to avoid the prior art. If at the time of the amendment, the equivalent was known in the pertinent prior art, the applicant should not be able to recapture it simply by establishing that a property of the equivalent—irrelevant to the broader claim before amendment—was relevant but unknown with respect to the objectives of the narrower amended claim. In other words,

an equivalent that is foreseeable as an alternative to the broader claimed feature does not become unforeseeable simply because the claimed feature is narrowed. For example, if a claim before amendment broadly claimed a metal filament for a light bulb but was later amended to avoid prior art and to specify metal A because of its longevity, the equivalent metal B, known in the prior art to function as a bulb filament, is not unforeseeable even though its longevity was unknown at the time of amendment.

Adopting this standard for foreseeability is not unfair when a reasonable applicant at the time of the amendment would have been aware of the equivalent as an alternative under the broader claim before the amendment. Under such circumstances the applicant can properly be charged with surrender by narrowing the claim to exclude the alternative. The Supreme Court noted that a surrender is appropriate where “the inventor turned his attention to the subject matter in question, knew the words for both the broader and narrower claim, and affirmatively chose the latter.” Festo VIII, 535 U.S. at 734-35.

We thus conclude that the function/way/result test or insubstantial differences test is inapplicable to the question of foreseeability. An equivalent is foreseeable if one skilled in the art would have known that the alternative existed in the field of art as defined by the original claim scope, even if the suitability of the alternative for the particular purposes defined by the amended claim scope were unknown.

V

The question then becomes whether the use of a non-magnetizable sleeve or a single sealing ring was known as an alternative in the prior art at the time of amendment. Because we conclude that use of non-magnetizable sleeves (including

aluminum sleeves) was foreseeable under the original broader claim, we need not determine whether use of a single sealing ring was foreseeable.

Dr. Stoll's original claim 1 did not include a requirement for a magnetizable sleeve and the claimed sleeve (which could have been composed of any material) was not designed to shield the magnetic field but rather to enclose the magnets. The magnetic shielding function was pertinent only to dependent claim 8 which required "a sleeve made of a magnetizable material." In response to the examiner's rejection and in light of the prior art, Dr. Stoll withdrew original claims 1 and 8 and filed a new amended claim that included a requirement for a magnetizable sleeve. A non-magnetizable sleeve was clearly known as available to perform the magnet-enclosing objectives of the claims before the amendment. Indeed, as the Supreme Court noted in Festo VIII, 535 U.S. at 741, it was specifically disclosed in the prosecution history. In making his amendment, Dr. Stoll attached two German patents that were cited in the first office action in the German patent application. One prior art German patent disclosed a "guide tube [that] is surrounded by a carriage [sleeve], which has the shape of a slit ring and is also made from a non-magnetic material." Along with the amended application, Dr. Stoll included the following statement:

These references were cited in the first Office Action received in the corresponding German application. These references are obviously clearly distinguishable over the subject matter of the claims now present in this application. Accordingly, further comment about the subject matter of these references is believed unnecessary.

Dr. Stoll did not expressly refer to the prior art non-magnetizable sleeve at the time of amendment, but, on cross-examination, Festo's expert, Dr. Wolf, was asked, "But there's no question that this is a prior art patent that shows a non-magnetizable

material?" Remand Trial Tr. 58 (Dec. 16, 2004). He responded, "That's correct." Id. While the prior art does not specifically disclose an aluminum alloy sleeve, it is undisputed that aluminum alloy is a non-magnetizable material. See Appellant's Br., 20.

Not only was the use of a non-magnetic sleeve disclosed in the prior art, the '125 patent application itself clearly recognized the possibility of using a non-magnetic material for the sleeve. As noted, the broadest claim in the patent as originally drafted did not include a requirement that the sleeve be magnetizable, and it was viewed as a matter of "choice" as to whether to include such a magnetizable sleeve. See Festo's Pre-Trial Memorandum at 91 (May 4, 1994) ("It is possible to use a magnetizable sleeve or a non-magnetizable sleeve and the device will work no matter which sleeve material is chosen. . . . The choice of the sleeve material is merely a matter of personal selection."). The specification suggests only that the use of a magnetizable material for the sleeve would be desirable because it would reduce "undesirable braking forces," which it characterizes as a "favorable development in the interests of increasing the drive force." '125 patent col.2 ll.28-35. As the district court noted, "[T]he '125 patent describes the shielding benefit of a magnetizable sleeve as beneficial but not necessary to the operation of the device" covered by the broader claims before amendment. Festo XI, at 19.

We conclude that use of an aluminum alloy sleeve was foreseeable at the time of amendment because the pertinent prior art disclosed a non-magnetizable sleeve. Festo could have claimed use of a non-magnetizable sleeve but did not do so. Accordingly, we find that the equivalent was surrendered by amendment.

CONCLUSION

For the reasons stated herein, the district court's judgment of non-infringement is

AFFIRMED.

COSTS

No costs.

# **United States Court of Appeals for the Federal Circuit**

05-1492

FESTO CORPORATION,

Plaintiff-Appellant,

v.

SHOKETSU KINZOKU KOGYO KABUSHIKI CO., LTD.,  
(also known as SMC Corporation)  
and SMC PNEUMATICS, INC.,

Defendants-Appellees.

NEWMAN, Circuit Judge, dissenting.

The only issue remaining in this case is the reapplication of the law of equivalency, as adjusted by the Supreme Court in Festo VIII, 535 U.S. 722 (2002), to the technological facts of the accused SMC rodless cylinder. However, this court has confounded the issue by creating a new and incorrect criterion for the measurement of "foreseeability," the court now holding that an existing structure need not be recognized, or even recognizable, as an equivalent at the time of the patent application or amendment, in order to be "foreseeable" if it is later used as an equivalent. This is a significant departure from precedent, as well as from the Court's guidance in understanding the estoppels that arise when claims are amended during prosecution. Today's new rule further erodes the residue of the doctrine of

equivalents, for its foreseeable result is to deprive amended claims of access to the doctrine of equivalents.

The panel majority reviews only the magnetizable sleeve aspect of the district court's opinion, and I limit my remarks to that element. The question is the foreseeability of the SMC sleeve made of aluminum alloy, when the '125 patent specification describes only a sleeve made of magnetizable metal. The claims were all limited to the magnetizable metal sleeve by voluntary amendment, for there was no rejection related to this aspect.<sup>1</sup> The court now rules that the equivalency of the magnetizable and nonmagnetizable metal was foreseeable as a matter of law, because a nonmagnetizable sleeve previously was known although its technological equivalency was unknown. The panel majority holds that "An equivalent is foreseeable if one skilled in the art would have known that the alternative existed in the field of art as defined by the original claim scope, even if the suitability of the alternative for the particular purposes defined by the amended claim scope were unknown." That is, even if unforeseeable as a matter of fact, even if technologically unexpected or unlikely, the equivalent must be ruled to be foreseeable if the structure is later found to be a usable equivalent.

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<sup>1</sup> In Festo VIII the Court explained that "[a] rejection indicates that the patent examiner does not believe the original claim could be patented. While the patentee has the right to appeal, his 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." Festo VIII, 535 U.S. at 734. Here there was no substantive rejection but only an objection due to claim form.

Festo's position throughout this litigation is that SMC's aluminum alloy sleeve actually provides sufficient shielding for the magnetic field leakage of the SMC device, thereby meeting the function/way/result criteria of equivalency as Graver Tank; and in response to the new issue of this remand, Festo points out that the use of aluminum alloy to this effect was not foreseeable when Festo's '125 patent application was filed and prosecuted. Thus Festo argues that it is not estopped to reach the SMC aluminum alloy sleeve under the doctrine of equivalents. However, the panel majority holds that this equivalent was foreseeable as a matter of law, and thus barred from access to the doctrine of equivalents.

This is not what the Court held. The Court held that an accused structure that is not within the literal scope of amended claims, but that is the technological equivalent thereof, cannot be captured under the doctrine of equivalents if the claims before amendment did not exclude that structure and the equivalency was "readily" foreseeable. My colleagues now hold that such structures can be foreseeable as a matter of law, although the equivalency was unknown in fact. My colleagues also deem it irrelevant whether the accused structure could have been included in allowable claims.

Although the technological equivalency of an accused structure is determined as of the time of the infringement, foreseeability is determined as of the time of filing and amendment of the patent application. The Court so recognized in Festo VIII, in its remand for finding whether the assertedly equivalent aluminum alloy sleeve used by SMC was "unforeseeable at the time of the application." 535 U.S. at 740. We then remanded to the district court with instructions to find "whether an ordinary skilled artisan would have

thought an aluminum sleeve to be an unforeseeable equivalent of a magnetizable sleeve in the context of the invention." Festo X, 344 F.3d at 1371-72.

The district court found that "any shielding capability of non-magnetizable aluminum alloy was unknown in the literature or to one of ordinary skill in 1981," and that "no one disputes that the use of an aluminum alloy sleeve for purposes of shielding magnetic fields was not known at the time of amendment." Festo XI, slip op. at 2. The district court nonetheless ruled that the use of aluminum alloy for shielding magnetic fields was foreseeable because the SMC magnetic leakage fields are "very small" and therefore little shielding is needed. The district court erroneously determined foreseeability based on the particular properties of the SMC device at the time of infringement, instead of on the knowledge at the time the '125 patent application was filed and presented.

My colleagues on this panel do not directly endorse the district court's reasoning, although similar reasoning is subsumed in the panel majority's holding that it is irrelevant whether the later-observed technologic equivalency was foreseeable at the time of the amendment. Instead, the panel majority rules that the aluminum alloy shield was retrospectively foreseeable at the time of the amendment because it later was used as an equivalent, although it was not known to be equivalent and would not have been deemed equivalent at the time of the amendment. Hindsight is not foreseeability. No error has been shown in the district court's finding that persons of skill in the field of the invention would not have deemed magnetizable and non-magnetizable sleeves to be equivalent at the time the '125 patent application was filed and prosecuted. It cannot be irrelevant that the then-existing knowledge in the field of the invention would not have deemed an

aluminum alloy sleeve equivalent to a magnetizable metal sleeve in shielding magnetic leakage fields.

Evidence of foreseeability must be limited to prior art, not future art. It is not the correct interpretation of foreseeability, to rely on SMC's later equivalent use of an aluminum alloy sleeve to prove that the nonmagnetizable aluminum alloy was a foreseeable equivalent of a magnetizable metal, "at the time of the application" for the '125 patent.<sup>2</sup> Foreseeability is determined as of the time of the application. The unforeseen does not become foreseeable after someone later discovers it. If the prior art does not support a finding of equivalency, the applicant cannot be charged with foreseeability of the equivalent.

My colleagues compound their error, in holding that "foreseeability does not require the applicant to be aware that a particular equivalent would satisfy the insubstantial differences test or the function/way/result test with respect to the claim as amended." Maj. op. at 1. Indeed, if the particular technology is not recognized as equivalent at the time of the application -- whether recognized by the applicant or by others of skill in the field -- that technology cannot be foreseeable. Foreseeability cannot be found as fact if the equivalence of magnetizable metal and aluminum alloy sleeves was not reasonably known at the time of filing and prosecution. In Graver Tank the Court explained: "An important factor is whether persons reasonably skilled in the art would have known of the interchangeability of an ingredient not contained in the patent with one that was." Graver Tank & Mfg. Co. v. Linde Air Prods. Co., 339 U.S. 605, 609 (1950). The inquiry surrounding when one becomes "aware" of equivalence must focus on the era of the

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2 In using these words, the Court did not distinguish among the time of filing, amendment, or grant; such distinction need not be resolved on the facts of this case.

application. If persons of ordinary skill in this field cannot be charged with foreseeing that an aluminum alloy sleeve would be a technological equivalent to a magnetizable metal sleeve, then the aluminum sleeve does not meet the criterion of foreseeability. The panel majority is incorrect in ruling that "the foreseeability requirement does not require the knowledge that the equivalent would satisfy the function/way/result test or the insubstantial differences test." Maj. op. at 18. How can a particular equivalent be foreseeable, if it was not known that the technology was equivalent in the context of the invention?

I also take note of the panel majority's unnecessary obfuscation of the technological criteria of equivalency as founded on Graver Tank, where the Court explained that "What constitutes equivalency must be determined against the context of the patent, the prior art, and the particular circumstances of the case," 339 U.S. at 609, the Court defining an equivalent as one that "performs substantially the same function in substantially the same way to obtain the same result." Id. at 608. The function/way/result test was endorsed by the court in Festo VIII, along with the insubstantial-differences test, and is no more susceptible to "endless bickering" as any other fact-dependent issue.

The panel majority states that it recognizes that the applicant can be charged with foreseeability only as to "[equivalents] known before the amendment, not equivalents known after the amendment," but then contravenes this statement, for my colleagues hold that it suffices to estop access to the doctrine of equivalents if the then-believed to be non-equivalent structure was a known structure in the field of the invention. My colleagues rule that it is irrelevant that the structure was believed not to be equivalent, as long as an original claim before amendment could have generally included a device having that structure. Such a complete bar based on amendment revives the approach rejected by the

Court when it called our previous assault on the doctrine of equivalents a "complete bar by another name," Festo VIII, 535 U.S. at 741, the Court overturning the Federal Circuit's holding in Festo VI.

The fact of whether technologic equivalency was known cannot be irrelevant to foreseeability, for the foreseeability bar is directed to subject matter that was foreseeably equivalent at the time of filing and amendment. This is evident from Festo VIII's guidance to "readily known equivalents." 535 U.S. at 740. If the equivalency of the accused technology would not have been "readily known" to a person of ordinary skill in the field of the invention, under proper application of the Court's guidance the "foreseeability" bar does not arise. In Festo VIII the Court ratified the value of the doctrine of equivalents to "ensur[e] the appropriate incentives for innovation," id. at 732, by rejecting this court's ruling that had led to "excessive uncertainty and burdens legitimate innovation." Id. at 737. The panel's holding today strays from controlling precedent as well as from logic. I respectfully dissent.