

**UNITED STATES COURT OF APPEALS  
FOR THE FEDERAL CIRCUIT**

FESTO CORPORATION,

Plaintiff-Appellee,

v.

SHOKETSU KINZOKU KOGYO KABUSHIKI  
CO., LTD., a/k/a SMC Corporation, and  
SMC Pneumatics, Inc.,

Defendants-Appellants.

No. 95-1066.  
April 19, 1999.

On remand from the United States Supreme Court  
Before: RICH, NEWMAN, and MICHEL, Circuit Judges.

Opinion by Judge Newman

PAULINE NEWMAN, Circuit Judge.

This case returns to us upon grant of certiorari by the United States Supreme Court, followed by vacatur and remand for further consideration in light of the Court's decision in *Warner-Jenkinson Co. v. Hilton Davis Chemical Co.*, 520 U.S. 17, 117 S. Ct. 1040, 41 USPQ2d 1865 (1997).<sup>1</sup> We now affirm the district court's judgment with respect to infringement of the Carroll patent, vacate and remand for

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<sup>1</sup> *Shoketsu Kinzoku Kogyo Kabushiki Co. v. Festo Corp.*, 520 U.S. 1111, 117 S. Ct. 1240 (1997).

further proceedings with respect to the Stoll patent, and reinstate our prior decision on the other issues.

### BACKGROUND

Festo Corporation sued Shoketsu Kinzoku Kogyo Kabushiki Co. (also known as SMC Corporation) and SMC Pneumatics, Inc. (collectively “SMC”) in the United States District Court for the District of Massachusetts, for infringement of two patents relating to magnetically coupled rodless cylinders. Rodless cylinders are used to repeatedly move articles a short distance, for example in assembly lines. By pneumatic or other fluid pressure a piston is moved within a cylinder, and the movement is translated by coupling of the piston to a yoke or other structure outside of the cylinder, which in turn carries the article to be moved.

For magnetic rodless cylinders the piston is not physically attached or yoked to the outer structure, but instead is magnetically coupled to a slidable outer ring or cylinder called the “follower,” that carries the article to be moved. When a burst of air or other fluid pressure moves the piston within the cylinder, by magnetic force the follower and its burden are correspondingly moved. The device, separated into its basic components, is pictured as follows:



Trial in the district court was preceded by an eleven-day evidentiary hearing before a special master. The master’s report was followed by various motions, of which the district court granted Festo’s motion for summary judgment that United States Patent No. 3,779,401 (the Carroll patent) was infringed under the doctrine of equivalents. The court also granted SMC’s motion for judgment of noninfringement by certain models of its rodless cylinders. Literal infringement by certain other models was not disputed.

The remaining issues were tried to a jury. The jury found that there was infringement of United States Patent No. 4,354,125 (the Stoll patent) on grounds of equivalency, sustained the validity of both the Carroll and the Stoll patents, and assessed damages. The court entered judgment accordingly, denying duly made post-trial motions. *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, No. 88-1814-PBS (D. Mass. Feb. 3, 1994).

On appeal of the issues of infringement of the Carroll and Stoll patents and damages, the Federal Circuit affirmed the judgments. *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 72 F.3d 857, 37 USPQ2d 1161 (Fed. Cir. 1995). SMC petitioned for writ of certiorari on two questions, with the following question directed to the doctrine of equivalents (the other question related to procedures involving the special master):

1. In a patent case, can the statutory requirement for patent claims (35 U.S.C. § 112, ¶ 2) and the statutory restriction for correcting them (35 U.S.C. § 251, ¶ 4) be nullified by the judicially created doctrine of equivalents?

Following its decision in *Warner-Jenkinson* the Court granted SMC's petition, vacated the Federal Circuit's decision, and remanded the case for further consideration; such a sequence of events is called a "GVR" (grant, vacate, remand). A GVR occurs when "intervening developments, or recent developments that we have reason to believe the court below did not fully consider, reveal a reasonable probability that the decision below rests upon a premise that the lower court would reject if given the opportunity for further consideration, and where it appears that such a redetermination may determine the ultimate outcome of the litigation, . . ." *Lawrence v. Chater*, 516 U.S. 163, 167 (1996). The Court espoused the just purpose of avoiding unequal treatment among cases raising similar issues, to

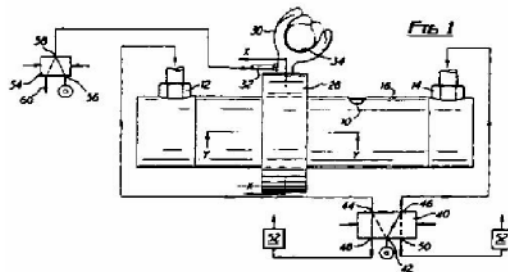
“improve the fairness and accuracy of judicial outcomes.” *Id.* at 168. *See also Stutson v. United States*, 516 U.S. 193, 197 (1996) (“a GVR order both promotes fairness and respects the dignity of the Court of Appeals by enabling it to consider potentially relevant decisions and arguments that were not previously before it”).

Upon remand this court invited additional briefing of the issues related to the doctrine of equivalents, *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 117 F.3d 1385 (Fed. Cir. 1997), and heard reargument as to both the Carroll and Stoll patents, including new issues of prosecution history estoppel upon which SMC submitted new evidence.

## I

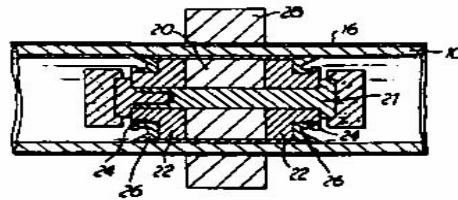
### THE CARROLL PATENT

The Carroll patent is directed to a magnetic rodless cylinder wherein several cylindrically shaped permanent magnets are disposed on the piston, and the follower is fitted with several annular permanent magnets. The exterior of the device is shown in Figure 1, wherein the cylinder 10 is encircled by the follower bearing permanent magnets of annular shape 28, and having a gripping device 30 which grasps the article to be moved.



Relevant to this appeal is the Figure 3 section taken at Y-Y of Figure 1, showing piston end member 22 bolted to magnet 20. The piston bears annular grooves 24 which accommodate sealing rings 26 adapted to engage the inner wall of cylinder 10 and form a fluid-tight seal.

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**FIG. 3**

Reexamined claim 9, the only claim of the Carroll patent in suit, is as follows, with our paragraphing and emphasis added to the subject matter relevant to infringement by equivalency:

9. A device for moving articles, which comprises:

a hollow cylinder formed of non-ferrous material and having opposite axial ends;

a piston mounted in the interior of the hollow cylinder and reciprocatingly slidable therein, the piston including a central mounting member disposed axially in the cylinder,

a plurality of cylindrically-shaped permanent magnets mounted on the central mounting member and spaced apart axially from each other, each magnet having a bore formed axially there-through for receiving the central mounting member,

at least one pair of end members mounted on the central mounting member and disposed on opposite axial sides of the plurality of magnets,

a pair of cushion members formed of resilient material, the cushion members being situated near opposite axial ends of the central mounting member to help prevent damage to the piston when the piston contacts an axial end of the cylinder,

*and a pair of resilient sealing rings situated near opposite axial ends of the central mounting*

*member and engaging the cylinder to effect a fluid-tight seal therewith;*

a body mounted on the exterior of the hollow cylinder and reciprocatingly slidable thereon,

the body including a plurality of annularly shaped permanent magnets surrounding the cylinder and spaced apart from each other,

the permanent magnets of the piston and body being polarized so as to magnetically couple the body to the piston whereby movement of the piston inside the cylinder causes a corresponding movement of the body outside the cylinder,

the body further including means provided thereon for holding on the body an article to be moved; and

means for controlling the admission of pressure fluid into the cylinder and exhaust fluid from the cylinder for moving the piston in the cylinder,

the attractive forces between the permanent magnets of the piston and the body being such that movement of the piston causes corresponding movement of the body below a predetermined load on the body and such that above said predetermined load movement of the piston does not cause corresponding movement of the body.

All of the subject matter of claim 9 was conceded by SMC to be literally present in the accused SMC devices, except for the pair of sealing rings. Instead of a pair of sealing rings situated at opposite ends of the piston, the SMC devices have a single two-way sealing ring at the end of the piston that is in contact with the pressure fluid. The SMC devices also have guide rings situated at each end of the piston.

In *Warner-Jenkinson* the Court, after concluding that

the doctrine of equivalents should be preserved,<sup>2</sup> focused on two aspects thereof: the all-elements rule and prosecution history estoppel. SMC states that the all-elements rule was violated by the district court's decision, and that the Court's new presumption of prosecution history estoppel precludes a holding of infringement, whether or not the all-elements rule also requires a decision in its favor. We reconsider the district court's judgment with respect to both of these aspects.

A  
THE ALL-ELEMENTS RULE

1. The Prior Proceedings

The substitution of a two-way sealing ring for the claimed pair of sealing rings was the basis of the district court's summary judgment of infringement of claim 9 under the doctrine of equivalents. SMC did not dispute that the two-way sealing ring effects a fluid-tight seal with the cylinder, the function stated in the claim clause directed to the sealing rings. SMC did not dispute the interchangeability of the two-way sealing ring and the pair of sealing rings, or that the claimed sealing function is achieved in the same way and with the same result. SMC's only argument to the district court was that the all-elements rule does not permit a finding of equivalence, as a matter of law, because the accused SMC devices do not contain two sealing rings or two equivalent elements.

The district court did not adopt SMC's view of the all-elements rule. Citing precedent wherein the all-elements rule was found to be satisfied when the function of the claimed element was performed but not by a direct

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<sup>2</sup> The virtually unanimous views of *amici curiae* the United States and technology-based industry were that the doctrine of equivalents should be preserved.

correspondence of components, the district court held that the substitution of a two-way sealing ring, which performs the same function as the pair of sealing rings, is in compliance with the all-elements rule. The district court explained:

To constitute an infringement, the accused device must contain each and every limitation of the claim or its substantial equivalent. *Vaupel [Textilmaschinen KG v. Meccanica Euro Italia S.P.A., 944 F.2d 870, 20 USPQ2d 1045 (Fed. Cir. 1991) ]*, 944 F.2d at 879. “An equivalent must be found for every limitation of the claim somewhere in an accused device, but not necessarily in a corresponding component, although that is generally the case.” *Corning Glass Works v. Sumitomo Elec. U.S.A., Inc.*, 868 F.2d 1251, 1259 (Fed. Cir. 1989) (adding negative dopant to the cladding is equivalent to adding positive dopant to the core in the context of the claimed invention).

Since equivalency was not disputed, and we agree that the claimed test is met of substantially the same function, way, and result, the district court granted Festo’s motion for summary judgment of infringement.

On this rehearing of its appeal to the Federal Circuit SMC again does not dispute the fact of equivalency, but again argues that the all-elements rule bars a finding of infringement. Citing *Pennwalt Corp. v. Durand-Wayland, Inc.*, 833 F.2d 931, 4 USPQ2d 1737 (Fed. Cir. 1987) (en banc) and ensuing Federal Circuit decisions, as now reinforced in *Warner-Jenkinson*, SMC argues that the all-elements rule precludes any liability under the doctrine of equivalents because the accused SMC devices do not contain a pair of sealing rings or two distinct elements that are the same as or equivalent to the pair of sealing rings.

In reviewing a grant of summary judgment the

appellate court must decide, on the record presented to the trial court, whether the movant is entitled to judgment as a matter of law. Fed. R. Civ. P. 56(c). Thus the evidence is viewed in the light most favorable to the non-movant, drawing factual inferences and resolving factual doubts in favor of the non-movant. *See, e.g., EMI Group North America, Inc. v. Intel Corp.*, 157 F.3d 887, 891, 48 USPQ2d 1181, 1184 (Fed. Cir. 1998) (citing *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 254 (1986)). Infringement in terms of the doctrine of equivalents is amenable to summary judgment when on the correct law, and undisputed facts or the non-movant's supportable version of the facts, the movant's position must prevail. *See Warner-Jenkinson*, 520 U.S. at 39 n. 8, 41 USPQ2d at 1875 n. 8 (summary judgment is proper when no reasonable jury could find the elements to be equivalent).

In affirming the district court's judgment we cited *Dolly, Inc. v. Spalding & Evenflo Cos.*, 16 F.3d 394, 398, 29 USPQ2d 1767, 1769 (Fed. Cir. 1994) and *Intel Corp. v. United States Int'l Trade Comm'n*, 946 F.2d 821, 832, 20 USPQ2d 1161, 1171 (Fed. Cir. 1991) for the principle that the all-elements rule may be satisfied although there is not one-to-one correspondence between each element of the claimed invention and each component of an accused device depending on the facts of the particular substitution. We first consider whether this principle continues to be viable in the wake of *Warner-Jenkinson*.

## 2. Precedent

In *Warner-Jenkinson* the Court reaffirmed the precept of the doctrine of equivalents that "a product or process that does not literally 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." 520 U.S. at 21, 117 S. Ct. at 1045, 41 USPQ2d at

1865. Thus the Court responded to the concerns expressed by the *amici* that the law continue to limit this opportunity for “fraud on the patent,” the words of *Graver Tank*, while guarding against undue breadth of the doctrine by confirming that it is the separate claim elements for which equivalency is determined, and not the invention as a whole:

Each element contained in a patent claim is deemed material to defining the scope of the patented invention, and thus the doctrine of equivalents must be applied to individual elements of the claim, not to the invention as a whole.

520 U.S. at 29, 117 S. Ct. at 1049, 41 USPQ2d at 1871.

The invention-as-a-whole criterion was discarded by the Federal Circuit en banc in its decision in *Pennwalt*, wherein the court adopted the all-elements rule. In the decade since *Pennwalt* the Federal Circuit has applied the rule in diverse factual situations and has refined its application accordingly. Thus in *Corning Glass Works v. Sumitomo Electric U.S.A., Inc.*, 868 F.2d 1251, 9 USPQ2d 1962 (Fed. Cir. 1989) the court elaborated that the accused device must contain every claim element, but “not necessarily in a corresponding component, although that is generally the case.” *Id.* at 1259, 9 USPQ2d at 1968. Discussing the all-elements rule in terms of claim limitations, the court explained:

A patentee is, for example, free to frame the issue of equivalency, if it chooses, as equivalency to a combination of limitations.

*Id.* at 1259 n. 6, 9 USPQ2d at 1968 n. 6.<sup>3</sup> In *Corning Glass*

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<sup>3</sup> Several Federal Circuit opinions state a preference for the usage “all limitations rule.” Although the Court in *Warner-Jenkinson* spoke in terms of elements, we discern no intention to overturn the “all limitations” usage, or to negate the often interchangeable use of these terms in Federal Circuit Precedent.

the claim limitations were found embodied in the accused device, although there was not directed correspondence between the claimed elements. *See also Perkin-Elmer Corp. v. Westinghouse Elec. Corp.*, 822 F.2d 1528, 1533 n. 9, 3 USPQ2d 1321, 1325 n. 9 (Fed. Cir. 1987) (“a limitation may include descriptive terms”).

Applying the rule in *Intel v. ITC*, 946 F.2d at 832, 20 USPQ2d at 1171, the court stated that: “The doctrine of equivalents does not require a one-to-one correspondence between the accused device and that disclosed in the patent.” In *Sun Studs, Inc. v. ATA Equipment Leasing Inc.*, 872 F.2d 978, 989, 10 USPQ2d 1338, 1347 (Fed. Cir. 1989), *overruled as to laches by A.C. Aukerman Co. v. R.L. Chaides Const. Co.*, 960 F.2d 1020, 1038-39, 22 USPQ2d 1321, 1333 (Fed. Cir. 1992) (en banc), the court stated: “One-to-one correspondence of components is not required, and elements or steps may be combined without *ipso facto* loss of equivalency.” In *Ethicon Endo-Surgery, Inc. v. United States Surgical Corp.*, 149 F.3d 1309, 1317, 47 USPQ2d 1272, 1277 (Fed. Cir. 1998), the court observed that the all-elements rule was not intended to “swallow” the doctrine of equivalents, as could occur if any change in a claim element or limitation were deemed fatal to compliance with the rule. Precedent since *Pennwalt* illustrates that the “all-elements rule” or “all-limitations,” in limiting application of the doctrine of equivalents to each claim element or step,<sup>4</sup> does not eliminate access to equivalency in all of the possible circumstances in which the components of an apparatus are realigned or a limitation is changed. The court’s experience of diverse claims and inventions in many different situations has imparted depth as well as rigor to the rule.

We discern in *Warner-Jenkinson* no basis for believing that the Court intended to erase this wealth of

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<sup>4</sup> In *Pennwalt* the omissions that gave rise to the all-elements rule were process steps.

precedent. The Court explained that in applying the rule it is appropriate to identify “the role played by each element in the context of the specific patent claim.” *Warner-Jenkinson*, 520 U.S. at 40, 117 S. Ct. at 1054, 41 USPQ2d at 1875. This analysis “will thus inform the inquiry as to whether a substitute element matches the function, way, and result of the claimed element, or whether the substitute element plays a role substantially different from the claimed element.” *Id.*

Compliance with the all-elements or all-limitations rule is determined at the threshold of the equivalency analysis, based on whether each claim element has a counterpart in the accused device or process, as informed by precedent. Compliance with the all-elements rule is a distinct inquiry from that of equivalency in fact; it is a determination of the relationship between the combination claimed and the components of the accused device or process, element by element. The Court in *Warner-Jenkinson* described this rule as a “legal limitation[ ] on the application of the doctrine of equivalents [and] to be determined by the court.” 520 U.S. at 39 n. 8, 117 S. Ct. at 1053 n. 8, 41 USPQ2d at 1875 n. 8. Thus we review compliance with the all-elements rule as a question for the court, first identifying the claim elements as a matter of construction of the claim, *see Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 38 USPQ2d 1461 (1996), and then determining the correspondence of these elements, or limitations, with the components or steps of the accused device or process.

### 3. Application to the Carroll Patent

The district court ruled, upon summary judgment, that the all-elements rule was not violated. The threshold question, on this GVR review, is whether that ruling was correct in law. The claim 1 “limitation” or “element” at issue in the Carroll patent is stated as follows:

and a pair of resilient sealing rings situated near opposite axial ends of the central mounting member

and engaging the cylinder to effect a fluid-tight seal therewith;

The accused SMC models use, instead of a pair of sealing rings situated at opposite ends of the piston, one two-way sealing ring situated at the end of the piston that contacts the pressure fluid. Either of these configurations effects a fluid-tight seal with the cylinder. SMC argues that by using a single sealing ring a claim element has been eliminated, violating the all-elements rule and thus precluding access to the doctrine of equivalents, whether or not there is equivalency in fact. Festo argues that the claim element is the pair of sealing rings, and that its substitution by a single sealing ring that performs the identical function does not completely eliminate the claim element and thus meets the requirements of the all-elements rule. Festo states that the caution in *Warner-Jenkinson* that “It is important to ensure that the application of the doctrine, even as to an individual element, is not allowed such broad play as to effectively eliminate that element in its entirety,” 520 U.S. at 29, 117 S. Ct. at 1049, 41 USPQ2d at 1871, recognized that there may be partial substitution for a claim element, such as by replacing the pair of sealing rings with one two-way sealing ring, in conformity with the all-elements rule.

*Warner-Jenkinson* teaches that it is appropriate to inquire into the “role” of the pair of sealing rings, and to compare that role with the role of the substituted two-way sealing ring. 520 U.S. at 40, 117 S. Ct. at 1054, 41 USPQ2d at 1875 (considering the role of each element in the context of the claim). Applying this principle, we observe that the role of the pair of sealing rings, as stated in the claim, is to effect a fluid-tight seal with the cylinder.<sup>5</sup> This role is

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<sup>5</sup> In the SMC devices there are additional rings at each end of the piston, which serve the guiding function of the omitted sealing ring. The district court did not treat this aspect in discussing the Carroll patent, and it is not essential to our

preserved in the two-way sealing ring of the SMC devices, wherein the claimed function is fully performed by the two-way sealing ring. The claimed pair of sealing rings has not been eliminated in its entirety, but has been substituted with a single two-way sealing ring that fully preserves the function stated in the claim. We therefore again affirm the district court's ruling that the all-elements rule is met by the sealing ring structure in the SMC devices, and that consideration of equivalency *vel non* of this limitation is not barred.

#### 4. Equivalency in Fact

The second step of the analysis, reached when the all-elements requirement has been met, is determination of whether there is in fact equivalency. Even a directly corresponding component is not *ipso facto* an equivalent; modifications that meet the all-elements requirement may nonetheless embody substantial change from the claim limitations and thus avoid equivalency in fact. For example, in *Dolly v. Spalding* the court recognized that “[a]n accused device may infringe under the doctrine of equivalents even though a combination of its components performs a function performed by a single element in the patented invention,” 16 F.3d at 398, 29 USPQ2d at 1770, yet the court found no equivalency on the facts of that case.

The factual inquiry starts with determination of the similarities and differences between the claim element and its embodiment in the accused device. Relevant are the classical criteria of whether the function, way, and result are substantially the same. The Court in *Warner-Jenkinson* directed particular attention to the factor of interchangeability, and whether a person skilled in the field of the invention would have known of the interchangeability of the substitution, at the time of the infringement. In its submissions in response to Festo's motion for summary judgment as to the Carroll patent, SMC did not challenge

Festo's evidence of technologic equivalency. SMC did not dispute that its two-way sealing ring performs the function of providing a fluid-tight seal, in the same way, with the same result, as the pair of sealing rings. No new material fact has been brought to our attention upon GVR. Thus the ruling of equivalency, on undisputed facts, is sustained.

We turn to the new issue raised by SMC, that of the Court's new presumption of prosecution history estoppel.

## B

### PROSECUTION HISTORY ESTOPPEL

#### 1. The New Presumption

Prosecution history estoppel is an adaptation of the common law of estoppel to the processes of patent examination. Tracing its origins to *Sutter v. Robinson*, 119 U.S. 530, 541 (1886), the Court in *Warner-Jenkinson* reinforced the equitable rule that one who takes a position in order to obtain a benefit can not later disavow or take an inconsistent position after the requested benefit is obtained based on the position taken.

Patent prosecution is a public record, and after grant of the patent the public has full access to the examiner's objections and the patentee's responses along the path to the grant. The estoppel arises from the examiner's reliance on the applicant's amendments and arguments in response to the examiner's objections, and the public interest in the patent grant imparts to the public the right to invoke an estoppel on the premises of the examination. Thus a patentee can not recover for infringement under the doctrine of equivalents when the asserted equivalent was yielded during the examination process in order to obtain the patent. *See Graham v. John Deere Co.*, 383 U.S. 1, 33 (1966) ("claims that have been narrowed in order to obtain the issuance of a patent by distinguishing the prior art cannot be sustained to cover that which was previously by limitation eliminated

from the patent”) (cited with approval in *Warner-Jenkinson*, 520 U.S. at 31, 117 S. Ct. at 1050, 41 USPQ2d at 1876).

In *Warner-Jenkinson* the Court reaffirmed the importance of prosecution history estoppel in applying the doctrine of equivalents. The Court explained that the estoppel arises from amendments that were required to be made for reasons of patentability, and established a new presumption that when it is not clear from the prosecution record why an amendment was made, there is a presumption that the amendment was made for reasons of patentability:

[W]e 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 would then 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. Where no explanation is established, however, the court should presume that the PTO had a substantial reason related to patentability for including the limiting element added by amendment.

520 U.S. at 33, 117 S. Ct. at 1051, 41 USPQ2d at 1873. This new presumption of estoppel is “subject to rebuttal if an appropriate reason for a required amendment is established.” *Id.* Thus the burden is shifted to the patentee. The court must consider the reason for the amendment and determine whether estoppel arises. The Court explained:

[I]f the patent-holder demonstrates that an amendment required during prosecution had a purpose unrelated to patentability, a court must consider that purpose in order to decide whether an estoppel is precluded.

520 U.S. at 40, 117 S. Ct. at 1054, 41 USPQ2d at 1876. The Court rejected, however, the argument that any amendment

whatsoever produces an estoppel, stating that “we see no substantial cause for requiring a more rigid rule invoking an estoppel regardless of the reasons for the change.” *Id.* at 32, 117 S. Ct. at 1050, 41 USPQ2d at 1872. The Court stated:

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.

*Id.* at 33, 117 S. Ct. at 1050-51, 41 USPQ2d at 1872.

Although prosecution history estoppel as to the Carroll patent was not an issue in the prior proceedings, in view of the GVR we now consider it. Upon additional briefing, SMC raises the issue of whether the new presumption of *Warner-Jenkinson* arises, based on a document presented to this court by SMC for the first time on this reargument.

## 2 Reexamination of the Carroll Patent

The relevant prosecution is that of the reexamination. The original claims of the Carroll patent did not mention the sealing rings. Festo introduced the entire claim clause directed to the rings and their function, along with several other changes in the claims, after the Carroll patent was accepted for reexamination. The sealing rings were depicted in Figure 3 of the original patent, see the drawing *ante*, and the written description described the sealing rings as effecting a fluid-tight seal, the function stated in the new claim clause. The other new claim clauses concern subject matter not at issue.

Festo cited as the reason for its reexamination request its own German Patent No. 1,982,379, which had not been cited by either the examiner or the previous patent owner during the initial examination. The German patent describes rodless cylinders having several of the features of the device described in the Carroll patent, including sealing rings. Festo

argued during the reexamination that Carroll's claimed features of the plurality of spaced magnets and the end members and cushions distinguished the Carroll invention from that described in the German patent. The examiner agreed, and in the "Reasons for Allowance" stated:

Claims 3, 4, 5, 6, and 9 are deemed allowable over the prior art of record, including German Patent No. 1,982,379 because the prior art does not teach or render obvious the claimed combination which includes the plurality of magnets, end members, and cushion members in the claimed relationship.

Carroll patent file history, Paper No. 7.

SMC argues that the Court's new presumption of estoppel bars all recourse to the doctrine of equivalents based on the sealing rings, because the amendment containing the sealing rings was added during reexamination. SMC states that by presenting this amendment Festo yielded all right to assert equivalency as to this element. Festo responds that no estoppel, and no presumption of estoppel, arises because the amendment adding the sealing rings to the claim was voluntary and was not required by an examiner's rejection. Festo points out that such sealing rings were known in the prior art, referring to the German patent as to which the Carroll patent was reexamined. The prosecution history is clear that neither Festo nor the examiner distinguished the German patent based on the sealing rings.

SMC points out that in requesting reexamination Festo made the obligatory representation that a new issue of patentability may be present, and that in granting the request for reexamination the examiner necessarily found that a new issue of patentability was present. Festo answers that the new issue flowing from German Patent No. 1,982,379 was not related to the sealing rings, referring to the prosecution record which shows lengthy discussion of the magnets and the cushion and end members, but mentions the sealing rings

only in a list of changes to the claim. Review of the prosecution history confirms Festo's position that the sealing rings were not discussed in the prosecution of the reexamination application.

SMC nonetheless states that *Warner-Jenkinson* requires that this amendment adding the sealing rings precludes any finding of equivalency relating to the sealing rings. SMC argues that the addition of the sealing rings clause during reexamination should be viewed as if it were required and related to patentability, on the basis that any change to claims is necessarily related to patentability. This position was rejected in *Warner-Jenkinson* when, considering a similar argument, the Court stated that "petitioner reaches too far in arguing that the reason for an amendment during patent prosecution is irrelevant to any subsequent estoppel." 520 U.S. at 30, 117 S. Ct. at 1049, 41 USPQ2d at 1871.

The same argument was discussed in *Hughes Aircraft Co. v. United States*, 140 F.3d 1470, 1476, 46 USPQ2d 1285, 1290 (Fed. Cir. 1998), wherein this court rejected the "contention that *Warner-Jenkinson* requires such a wooden approach to prosecution history estoppel." *See also Litton Systems, Inc. v. Honeywell, Inc.*, 140 F.3d 1449, 1455, 46 USPQ2d 1321, 1325 (Fed. Cir. 1998) (the court must inquire into the reason for the amendment). However, when an amendment is required for reasons of patentability, estoppel arises and the court must determine the extent of the estoppel. *Id.* Further, as the Court noted in *Warner-Jenkinson*, the court may "explore the reason (right or wrong) for the objection and the manner in which the amendment addressed and avoided the objection." 520 U.S. at 33 n. 7, 117 S. Ct. at 1051 n. 7, 41 USPQ2d at 1872 n. 7.

In the large body of Federal Circuit precedent on various aspects of prosecution history estoppel, this court has rigorously held patent applicants to positions taken in order

to establish patentability during prosecution. *See, e.g., Mannesmann Demag Corp. v. Engineered Metal Prods. Co.*, 793 F.2d 1279, 1284-85, 230 USPQ 45, 48 (Fed. Cir. 1986) (the court shall determine the extent of the estoppel in light of the applicant's amendments, statements to the examiner, the prior art that has been distinguished, and the effect of the amendment on the allowance of the claims). However, a voluntary amendment, not accompanied by argument or representations relevant to patentability, does not necessarily generate an estoppel, any more than do the claims as originally filed. *See Warner-Jenkinson, supra.* SMC's position that estoppel is automatic as to any claim limitation added by amendment is not an accurate statement of the holding of *Warner-Jenkinson*.

For the Carroll patent, the voluntary amendment adding the sealing rings was not made in response to a relevant rejection. It is not disputed that the sealing rings were known in the prior art. The sealing rings were not at issue during the reexamination, and neither rejection nor argument was made concerning the sealing rings. The examiner's stated reasons for grant of the reexamined claims were unrelated to the sealing rings. We conclude that prosecution history estoppel does not affect the application of the doctrine of equivalents to the sealing rings.

## CONCLUSION

Upon reconsideration, the district court's application of the all-elements rule to the Carroll patent has not been shown to be in error. Prosecution history estoppel does not arise. Equivalency in fact was not disputed. Thus the summary judgment of infringement of the Carroll patent is affirmed.

## II THE STOLL PATENT

The jury found infringement of the Stoll patent in

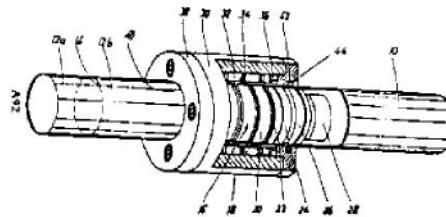
terms of the doctrine of equivalents. On its prior review the Federal Circuit affirmed this judgment, concluding that the jury had been charged with the correct law, with special attention to the all-elements rule, and that there was substantial evidence whereby reasonable jurors could have reached the verdict of infringement.

Upon GVR rehearing, SMC again argues that the all-elements rule was not met. SMC also raises new issues of estoppel, providing this court with documentary evidence not of record before the trial court. Although we conclude, as we shall discuss, that the all-elements rule was met and that the jury verdict of equivalency was supported by substantial evidence, a new issue has been raised of possible estoppel with respect to the sealing rings element of the Stoll claims. Although Festo cogently objects to the reopening of this issue based on documents that have long been available to SMC (the translation of German patents cited during prosecution), in full implementation of the GVR we have received this new evidence into the appeal record. We now determine that a new issue has been raised which warrants further development, not available *ab initio* on appeal; thus this issue requires remand to the district court. The other issues are resolved upon this reconsideration, as we discuss.

#### A

#### THE STOLL INVENTION

The Stoll patent describes and claims an improved magnetic rodless cylinder, illustrated as follows:



The relevant structure includes cylindrical tube 10 in

which moves piston 16. Sealing rings 26 and guide rings 24 are seated in grooves at each end of the piston. The outer cylindrical sleeve is shown at 30. Claim 1 of the Stoll patent follows, with our paragraphing and emphases added to show the elements relevant to this appeal:

1. 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.

SMC argues that the all-elements rule is not met by the judgment of infringement as to two aspects; first, because in the SMC devices the first sealing rings are substituted with a single two-way sealing ring, and second, because the cylindrical sleeve in the SMC devices is not made of a magnetizable material. SMC also argues that the factual questions of equivalency were wrongly decided, and that prosecution history estoppel precludes infringement. Festo disputes these arguments, states that the all-elements rule was correctly stated and applied, that there was no issue of prosecution history estoppel, and that there was substantial evidence supporting the jury verdict. Festo argues that nothing in *Warner-Jenkinson* warrants rejecting this verdict and the district court's decision denying SMC's post-trial motions for judgment as a matter of law.

## B

## THE ALL-ELEMENTS RULE

SMC stated in its petition for certiorari that at the trial, and in instructing the jury, the district court applied the invention-as-a-whole standard of equivalency instead of the all-elements rule, and that this fundamental flaw pervaded the prior appeal to the Federal Circuit. That is incorrect. The all-elements rule was the law that was applied at trial and on appeal. Argument as to this issue dominated the motions for summary judgment, the trial to the jury, the arguments on post-trial motions, and the prior appeal to the Federal Circuit.

At the trial of infringement of the Stoll patent the district court instructed the jury on the all-elements rule as follows:

Now, let me move on to the second step and explain that a little more. The second step is to decide whether each limitation in the properly construed claims is found in the accused device. Liability for infringement requires that an accused device contain every limitation of a claim or its substantial equivalent.

Let me repeat that. Liability for infringement requires that an accused device contain every limitation of a claim or its substantial equivalent.

Here the claim of infringement is a claim under what you have now heard referred to many times as infringement under the doctrine of equivalence. Infringement of a patent claim can be found by way of the doctrine of equivalence.

It is insufficient for proof of infringement under this doctrine of equivalence that the accused devices are equivalent overall to the claimed invention.

SMC argues that this instruction did not adequately state the

law as now set forth in *Warner-Jenkinson*, stating in its brief on reconsideration that “the jury instruction would not be sufficient today since it does not include a caution (‘special vigilance’) against any theory which eliminates a claim element.” However, it is hard to imagine a clearer caution against elimination of a claim element, or a plainer statement of the all-elements rule, than was stated by the district court. The technological facts concerning the embodiment of the claimed elements in the SMC devices were presented by witnesses and argued by counsel in the context of the all-elements rule, whose emphasis pervaded the trial.

We do not discern grounds for reversal or a new trial based on any error in the jury instructions or the law as applied by the district court upon post-trial motions. The instructions state the correct law, no objection was made to these instructions at the trial, and the law as stated does not differ from that of the Court in *Warner-Jenkinson*. Nor was any objection made to the presentation of this question to the jury upon these instructions. We turn to review of the jury verdict, as did the district court, upon the principles of judgment as a matter of law.

## C

### THE ISSUES OF EQUIVALENCY

The jury verdict was that claim 1 of the Stoll patent was infringed under the doctrine of equivalents. The district court entered judgment accordingly. We have again reviewed the evidence to ascertain whether the jury’s express or implicit findings were supported by substantial evidence, and whether the legal conclusion represented by the verdict was adequately based on supported findings, accompanied by correct application of the law to the facts. *See Shatterproof Glass Corp. v. Libbey-Owens Ford Co.*, 758 F.2d 613, 619, 225 USPQ 634, 636 (Fed. Cir. 1985) (“In reviewing a decision denying a motion for judgment notwithstanding the verdict, we do not approach the issues as

if there had been no trial. We review the evidence as a whole, and ascertain whether the verdict is in accordance with law, and whether there was substantial evidence in support of the jury's verdict.")

### 1. The Sealing Rings

SMC argues that the claim term "first sealing rings" designates two elements, and that the all-elements rule requires the substitution of two separate elements that are the same or equivalent elements. As discussed in connection with the Carroll patent, the all-elements rule requires that a claim element not be "eliminated in its entirety," *Warner-Jenkinson*, 520 U.S. at 29, 117 S. Ct. at 1049, 41 USPQ2d at 1871, and within that framework the rule does not preclude all counterpart embodiments except one-to-one correspondence. *See* Part I.A *ante*.

The issues as to the Stoll patent, with respect to the sealing rings, are not the same as for the Carroll patent. The Stoll claimed element of the "first sealing rings" is associated with the additional function of the wiping of impurities to avert contamination of the magnets. SMC states that when one of the sealing rings is absent this function is not performed. The written description states that the wiping function is also performed by the adjacent guide rings:

any such impurities are pushed along in front of piston 16 by the sealing rings 26 or—should they manage to get past these—by the sliding guide rings 24, so that the annular magnet arrangement is invariably faced with a clean section of the internal tube wall.

Stoll patent, col. 3, lines 51-55.

SMC argues that this multiplicity of rings and functions distinguishes the Stoll invention from that of the Carroll patent, such that even if the all-elements rule was met as to Carroll, it is violated as to Stoll. Festo states that

the evidence supports the contrary conclusion.

Festo's witnesses testified to the correspondence between the first sealing rings and the SMC two-way sealing ring, and that the guide rings in the SMC devices also perform a wiping function as taught in the specification. Inquiry under the all-elements rule is "[informed by] an analysis of the role played by each element in the context of the specific patent claim." *Warner-Jenkinson*, 520 U.S. at 40, 117 S. Ct. at 1054, 41 USPQ2d at 1875. The role of the sealing rings and the guide rings in wiping the cylinder was fully explored at the trial, where SMC did not dispute that the wiping function was performed in the SMC devices.

The verdict is in accord with the precepts of *Warner-Jenkinson*, for the claimed element of the "first sealing rings" was not eliminated in its entirety, and the limitation of the wiping function was shown to be performed. *See Corning Glass*, 868 F.2d at 1259, 9 USPQ2d at 1968 ("An equivalent must be found for every limitation of the claim somewhere in an accused device, but not necessarily in a corresponding component, although that is generally the case"). We conclude that the threshold premise of the jury verdict, that the all-elements rule was met, was supported and must be sustained.

On the question of equivalency in fact, Festo's mechanical expert Dr. Barry Wolf, and the inventor Dr. Stoll, testified to the facts of interchangeability of the ring structures, and the substantial identity of function, way, and result. SMC did not present any contrary evidence or witnesses. We conclude that substantial evidence supported the verdict of infringement under the doctrine of equivalents with respect to the issue of the first sealing rings.

## 2. The Magnetizable Material of the Sleeve

The relevant claim clause is as follows:

wherein said driven member includes a cylindrical

sleeve made of a magnetizable material and encircles said tube,

In the SMC devices the cylindrical sleeve is made of an aluminum alloy, a material not generally viewed as magnetizable. SMC argues that the magnetizable material is a separate claim element, and that since the SMC sleeve is not made of magnetizable material the all-elements rule prohibits the asserted equivalency. Thus SMC argues that it is irrelevant whether or not the sleeves are equivalent in fact.

Festo responds that equivalency was properly determined as to the “cylindrical sleeve made of a magnetizable material,” citing *Corning Glass* for its explanation that “a patentee is, for example, free to frame the issue of equivalency, if it chooses, as equivalency to a combination of limitations.” 868 F.2d at 1259 n. 6, 9 USPQ2d at 1968 n. 6. We agree that this precedent aptly fits the situation presented herein. Thus although a change of the material or properties of a component may (or may not) defeat equivalency as a matter of fact, it does not bar access to the doctrine of equivalents as a matter of law.

Testifying on the factual question of equivalency, Festo’s expert witness in the field of physics and magnetism, Dr. Schroeder, explained at the trial that the purpose of the magnetizable material was to contain any magnetic flux emanating from the cylinder, lest such flux act as a brake on the piston, thereby decreasing the efficiency of the device. Dr. Schroeder explained that because of the small gap between the cylinder and the surrounding sleeve, substantially all of the magnetic flux is concentrated internally in the cylinder and any magnetic flux emanating from the cylinder is very small. His tests showed that the SMC sleeve, although made of an aluminum alloy, nonetheless minimized magnetic leakage fields and reduced the leakage by 300%. He testified that because of the very small leakage this containment of magnetic flux occurs in

substantially the same way with the same result as for the sleeve made of magnetizable material.

SMC presented no data or test evidence on its behalf, but at the trial challenged the significance of Dr. Schroeder's testimony. On this appeal SMC again criticizes Dr. Schroeder's testimony and the meaning of his results. However, there was substantial evidence whereby a reasonable jury could have found equivalency between the claimed sleeve and the sleeve of the SMC devices.

### 3. The Verdict of Infringement

The verdict of infringement based on the doctrine of equivalents must be sustained. However, SMC has raised new issues of prosecution history estoppel, to which we turn.

#### D

#### PROSECUTION HISTORY ESTOPPEL

The parties dispute whether prosecution history estoppel was an issue at trial. In order fully to implement the GVR we have considered this issue, which was briefed for this reconsideration hearing. We conclude, as we shall discuss, that the Court's new presumption of estoppel is relevant to the Stoll patent.

The prosecution of the Stoll patent is shown in the record before us as follows: The patent application as filed in the United States was an English- language counterpart of the German patent application. In the first Action the United States examiner made no rejection on prior art, although three references were listed as "believed pertinent" without further analysis. The examiner's only substantive comment was under '112 & 1, the examiner stating: "Exact method of operation unclear. Is device a true motor or magnetic clutch?" The examiner objected, citing '112 & 2, to some of the claims as being in multiple dependent form, a style prohibited in United States practice.

In response Festo clarified the nature of the device and rewrote the claims. In so doing, Festo included in the broadest claim (claim 1) the subject matter relating to the sealing means and the magnetizable sleeve that had been initially presented in dependent claims. Claim 1 as initially filed recited “sealing means at each end” of the piston “for wiping engagement.” On rewriting after the examiner’s initial Action, Festo replaced the “sealing means at each end” phrase with “first sealing rings located axially outside said guide rings,” the text of dependent claim 4. Festo also replaced the phrase “hollow cylindrical assembly” of original claim 1 with “a cylindrical sleeve made of a magnetizable material and encircles said tube,” from dependent claim 8. No explanation was given for these changes. The district court discussed the magnetizable sleeve in its ruling on pre-trial motions, and observed that this amendment did not appear to be needed to distinguish from prior art:

Although the examiner identified certain “cited references believed pertinent,” there is nothing in the record or the [master’s] report to indicate that the limitation of a magnetizable sleeve was necessary to distinguish the claimed invention over prior art.

Accompanying the amendment Festo submitted two German patents that had been cited during examination of the corresponding German application and made the following statement:

Applicant wishes to make of record German Offenlegungsschrift No. 27 37 924 and German Gebrauchsmuster No. 19 82 379. 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. It is clear that neither of these references discloses the use of structure preventing the interference of impurities located inside the tube and on the outside of the tube while the arrangement is moved along the tube.

Thus Festo referred to the wiping structure and function as not being described in the prior art. No mention was made, by applicant or examiner, of the magnetizable material or any other changes to the claims.

No rejection as to patentability was made by the United States examiner, and no other argument was presented by the applicant. SMC now states that Festo obviously amended the claims in light of the two German references it had cited, and argues that Festo is estopped from asserting equivalency as to the changes that were made in the claims. SMC states that it is irrelevant whether references were relied on by the examiner as grounds of rejection, or cited by the applicant, in order to generate an estoppel or a presumption of estoppel, against the assertion of equivalency of amended claim elements. That theory is not in accordance with the rulings of *Warner-Jenkinson*, for the Court explicitly directed its presumption to amendments that were “required” during prosecution:

[W]e think the better rule is to place the burden on the patent-holder to establish the reason for an amendment required during patent prosecution.

520 U.S. at 33, 117 S. Ct. at 1051, 41 USPQ2d at 1873. Although SMC argues that the Stoll claim was amended to avoid some possible future rejection, in *Warner-Jenkinson* the Court, citing *Exhibit Supply Co. v. Ace Patents Corp.*, 315 U.S. 126, 136 (1942), dealt with a position similar to that now pressed by SMC:

Chief Justice Stone distinguished inclusion of a

limiting phrase in an original patent claim from the “very different” situation in which [changes were made] “in order to meet objections in the Patent Office, *based on references to the prior art.*” [Emphasis in *Warner-Jenkinson.*]

*Warner-Jenkinson*, 520 U.S. at 31, 117 S. Ct. at 1049-50, 41 USPQ2d at 1872. The Court further held:

Our prior cases have consistently applied prosecution history estoppel only where claims have been amended for a limited set of reasons, and we see no substantial cause for requiring a more rigid rule involving an estoppel regardless of the reasons for a change.

*Id.* at 32, 117 S. Ct. at 1050, 41 USPQ2d at 1872. SMC’s theory is thus incorrect, for *Warner-Jenkinson* negates the position that every voluntary amendment must be deemed “required,” whatever its provenance. However, when an amendment is accompanied by argument or explanation that distinguishes an amended portion of the claims from prior art, it is appropriate to apply the established rules of prosecution history estoppel to that subject matter. *See Id.* at 33-34, 117 S. Ct. at 1050-51, 41 USPQ2d at 1872 (analyzing explained amendment under established principles).

SMC did not previously raise the issue of prosecution history estoppel as to the two German references that Festo filed with the PTO, and did not provide the district court with translations of those references (which were in the Stoll prosecution history only in German). The district court discussed the amendment adding the magnetizable material to claim 1 as follows:

[T]he reason why the newly substituted independent claim has the limitation that the sleeve be made of magnetizable material is a mystery, for nothing seems to turn on its composition for purposes of

procuring the patent. At the very least, it is a question of fact.

Unlike the statements accompanying the amended claims concerning the sealing rings and the wiping function, no representation was made to the examiner concerning the magnetizable material of the sleeve. There is no basis for overturning the finding of the district court that the amendment concerning the magnetizable material was voluntary, and not required for patentability, *see Warner-Jenkinson*, 520 U.S. at 32, 117 S. Ct. at 1050, 41 USPQ2d at 1872 (discussing required amendments). We have been directed to no information in the newly cited translations that would lead us to require the district court to redo its study of the prosecution history and its comprehensive analysis of estoppel with respect to the magnetizable sleeve; no ruling or guidance in *Warner-Jenkinson* suggests error in the district court's analysis.

However, as to the element of the sealing rings, the prosecution history raises an unresolved issue. The applicant's reference to the wiping function, in the letter accompanying the amendment, raises the issue of whether this amendment was made for reasons of patentability, or whether the *Warner-Jenkinson* presumption arises and can, or can not, be rebutted. This issue was not before the district court, and the record is insufficient for appellate determination ab initio. In full implementation of the GVR, we remand for determination of whether such presumption has arisen, whether it can be rebutted, and the scope of any resultant estoppel. *See Litton v. Honeywell*, 140 F.3d at 1455, 46 USPQ2d at 1325 (vacating the district court's grant of JMOL and remanding for determination of prosecution history estoppel).

Should the district court find an estoppel or a presumption thereof not previously considered and not rebutted, the district court shall redetermine the question of

equivalency within the confines of that estoppel. In the event that the district court determines that there is no estoppel affecting the finding of equivalency as to the sealing rings and their wiping function, the verdict of infringement may be reinstated.

### CONCLUSION

The judgment of infringement of the Stoll patent is vacated, and the cause is remanded for redetermination, consistent with our discussion herein.

### III OTHER ISSUES

The remand from the Supreme Court related only to the issues of the doctrine of equivalents. We reinstate the other portions of our prior decision, *viz.* the rulings relating to the special master proceedings and the measure of damages. *See Hughes Aircraft*, 140 F.3d at 1473-74, 46 USPQ2d at 1287-88 (“Vacatur and remand by the Supreme Court, however, does not create an implication that the lower court should change its prior determination.”) (citing *United States v. M.C.C. of Florida, Inc.*, 967 F.2d 1559, 1561 (11th Cir. 1992)).

#### Costs

Each party shall bear its costs.

AFFIRMED IN PART, VACATED IN PART, AND  
REMANDED.

**UNITED STATES COURT OF APPEALS,  
FOR THE FEDERAL CIRCUIT**

FESTO CORPORATION,

Plaintiff-Appellee,

v.

SHOKETSU KINZOKU KOGYO KABUSHIKI  
CO., LTD., a/k/a SMC Corporation, and  
SMC Pneumatics, Inc.,

Defendants-Appellants.

No. 95-1066.

Dec. 14, 1995.

Appeal from the United States District Court  
for the District of Massachusetts

Patti Saris , District Judge, Presiding

Before RICH, NEWMAN, and MICHEL, Circuit Judges.

Opinion by Judge Newman

NEWMAN, Circuit Judge.

Shoketsu Kinzoku Kogyo Kabushiki Co., Ltd., also known as SMC Corporation, and SMC Pneumatics, Inc. (collectively SMC) seek reversal of the judgment of the United States District Court for the District of Massachusetts,<sup>6</sup> holding that SMC had infringed two patents owned by Festo Corporation and assessing damages. The patents relate to magnetically coupled rodless cylinders wherein the follower moves by magnetic attraction to the piston, which is moved hydraulically or pneumatically. We affirm the judgment.

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<sup>6</sup> *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, No. 881814-PBS (D. Mass. Feb. 3, 1994).

## I

## SUMMARY JUDGMENT—THE CARROLL PATENT

Before trial the district court granted Festo’s motion for partial summary judgment, finding infringement of United States Patent No. 3,779,401 (the Carroll patent) under the doctrine of equivalents. SMC, appealing this judgment, argues that in summarily finding infringement the trial judge engaged in impermissible fact-finding, contrary to the appropriate standard for Rule 56 determinations. We review the summary judgment for correctness of the process, as well as for its legal conclusion. The grant of summary judgment is given plenary review on appeal.

Summary judgment is appropriate when “the pleadings, depositions, answers to interrogatories, and admissions on file, together with the affidavits, if any, show that there is no genuine issue as to any material fact and that the moving party is entitled to a judgment as a matter of law.” Fed. R. Civ. P. 56(c); *Celotex Corp. v. Catrett*, 477 U.S. 317, 322 (1986). A material fact is one whose finding is necessary to the proceedings. *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 248 (1986). A genuine issue of material fact is shown to exist if sufficient evidence is presented whereby a reasonable fact finder could decide the question in favor of the nonmoving party. *Id.* The evidence submitted by the nonmovant, in opposition to a motion for summary judgment, “is to be believed, and all justifiable inferences are to be drawn in his favor.” *Id.* at 255.

In ruling on a motion for summary judgment the court must bear in mind the actual quantum and quality of proof necessary to support liability under the applicable law. *Id.* at 254. It is the opposing party’s responsibility to raise issues of material fact that would make summary judgment inappropriate. *Matsushita Elec. Indus. Co. v. Zenith Radio Corp.*, 475 U.S. 574, 585-87 (1986). The court must assess the adequacy of the nonmovant’s response and must

determine whether the showing the nonmovant asserts it would have made at trial would be sufficient to sustain its position. *See Celotex*, 477 U.S. at 322.

The infringement issue concerning the Carroll patent, which expired in 1990, was focused on reexamined claim 9, shown in the margin.<sup>1</sup> All of the claim elements were

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<sup>1</sup> Claim 9. A device for moving articles, which comprises:  
a hollow cylinder formed of non-ferrous material and having opposite axial ends;  
a piston mounted in the interior of the hollow cylinder and reciprocatingly slidable therein, the piston including a central mounting member disposed axially in the cylinder,  
a plurality of cylindrically-shaped permanent magnets mounted on the central mounting member and spaced apart axially from each other, each magnet having a bore formed axially there-through for receiving the central mounting member, at least one pair of end members mounted on the central mounting member and disposed on opposite axial sides of the plurality of magnets,  
a pair of cushion members formed of resilient material, the cushion members being situated near opposite axial ends of the central mounting member to help prevent damage to the piston when the piston contacts an axial end of the cylinder,  
and a pair of resilient sealing rings situated near opposite axial ends of the central mounting member and engaging the cylinder to effect a fluid-tight seal therewith;  
a body mounted on the exterior of the hollow cylinder and reciprocatingly slidable thereon, the body including a plurality of annularly shaped permanent magnets surrounding the cylinder and spaced apart from each other,  
the permanent magnets of the piston and body being polarized so as to magnetically couple the body to the piston whereby movement of the piston inside the cylinder causes a corresponding movement of the body outside the cylinder,  
the body further including means provided thereon for holding on the body an article to be moved;  
and means for controlling the admission of pressure fluid into the cylinder and exhaust fluid from the cylinder for moving the piston in the cylinder, the attractive forces between the permanent magnets of the piston and the body being such that movement of the piston causes corresponding movement of the body below a predetermined load on the body and such that above said predetermined load movement of the

conceded to be literally present in the accused devices except for both members of the pair of resilient sealing rings. SMC stated to the special master “We’ve decided that we will not be presenting any testimony concerning infringement.” Absent evidence that placed in dispute the facts of infringement, summary judgment could properly be granted on undisputed facts.

In granting summary judgment that the claim was infringed, the district court observed that SMC offered no evidence to refute Festo’s assertion that substantially the same function was performed, in substantially the same way with the same result, by the claimed pair of resilient sealing rings when situated one at each end of the central mounting member, and by SMC’s single ring situated at the end contacted by the pressure fluid. Although SMC now argues that there has not been compliance with the “all elements rule” of *Pennwalt Corp. v. Durand-Wayland, Inc.*, 833 F.2d 931, 935, 4 USPQ2d 1737, 1739-40 (Fed. Cir. 1987) (in banc), *cert. denied*, 485 U.S. 961, 1009 (1988), we take note that, as held in *Dolly, Inc. v. Spalding & Evenflo Cos.*, 16 F.3d 394, 398, 29 USPQ2d 1767, 1769 (Fed. Cir. 1994) and *Intel Corp. v. U.S. Int’l Trade Comm’n*, 946 F.2d 821, 832, 20 USPQ2d 1161, 1171 (Fed. Cir. 1991), there need not be one-to-one correspondence between the components of an accused device and the claimed invention. It was not disputed that the rings served the primary function of providing a tight seal at the end contacted by the pressure fluid. There was undisputed evidence to support a finding that the two-way seal employed by SMC, as used in the accused device, corresponds to the two resilient sealing rings of the claimed invention. On the record that was the basis of the motion for summary judgment we do not discern reversible error in the court’s grant of summary judgment of

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piston does not cause corresponding movement of the body.  
[Paraphrasing added.]

infringement as to the Carroll patent. That judgment is affirmed.

## II THE JURY TRIAL

The remaining issues were tried to the jury. The jury found valid the Carroll patent and the Stoll patent (United States Patent No. 4,354,125), found the Stoll patent infringed, and assessed damages. The district court entered judgment on the jury verdict, denying duly made post-trial motions. The issues appealed relate only to infringement and damages; no appeal is taken on the issue of validity of either the Carroll or the Stoll patent.

We review the jury verdict to ascertain whether there was substantial evidence whereby a reasonable jury could have reached the verdict that was reached. Substantial evidence is such relevant evidence, on the record as a whole, as could be accepted by a reasonable mind as adequate to support the verdict. *Perkin-Elmer Corp. v. Computervision Corp.*, 732 F.2d 888, 893, 221 USPQ 669, 673 (Fed. Cir.), *cert. denied*, 469 U.S. 857 (1984). The court must consider the evidence in the light most favorable to the party in whose favor the jury found, and must not substitute its choice for the jury's in drawing factual inferences or deciding between conflicting evidence. *Brooktree Corp. v. Advanced Micro Devices, Inc.*, 977 F.2d 1555, 1580, 24 USPQ2d 1401, 1419 (Fed. Cir. 1992).

### A. INFRINGEMENT OF THE STOLL PATENT

Stoll patent claim 1 is shown in the margin.<sup>2</sup> The

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<sup>2</sup> Claim 1. 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,

issue of infringement focused on the claim clauses relating to the guide rings and sealing rings, for some of the accused devices contained four rings and some contained only three rings; and to the magnetizable material in the sleeve of the follower. The presence of all other claim elements and limitations in the accused devices was conceded. We confirmed in *Hilton Davis Chem. Co. v. Warner-Jenkinson Co.*, 62 F.3d 1512, 35 USPQ2d 1641 (Fed. Cir. 1995) (en banc ) that the fundamental inquiry with respect to equivalency is whether the accused device is substantially the same as the patented invention, affirming the utility of the function/way/result test for substantial identity, and the

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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 slidably 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 second permanent annular magnets will be free of interference from said impurities. [Paragraphing added.]

relevance of objective considerations such as copying or independent development.

Both sides presented testimony and made cogent arguments at trial on the merits of their respective positions on the technologic aspects of equivalency. There was expert testimony on behalf of Festo that the SMC cylinder having a follower using an aluminum alloy sleeve encircling the magnets is substantially the same as the claimed cylinder wherein the sleeve is made of “magnetizable material,” and that both serve the function of reducing magnetic leakage. Festo’s expert witness in the field of physics and magnetism, Dr. Schroeder, explained that because of the small gap, any magnetic flux leaking from the cylinder is very small. He showed the tests he conducted on the SMC sleeve, and explained the evidence that a 300% reduction in magnetic leakage fields was produced by the SMC sleeve. Dr. Schroeder explained how he analyzed the composition of the SMC sleeve and compared it to the sleeve described in the patent. He testified that the SMC sleeve formed a magnetic circuit in substantially the same way as the sleeve of the patent, that it served the same function of shielding and minimizing leakage fields, and that it obtained substantially the same result of avoiding undesirable braking forces.

There was also evidence before the jury concerning the double rings at each end of the central member. SMC argues that the omission of one of the sealing rings precludes a finding of infringement, under the “all elements rule” of *Pennwalt*. However, this rule does not require a one-to-one correspondence of components. *See, e.g., Dolly v. Spalding*, 16 F.3d at 398, 29 USPQ2d at 1769; *Intel v. ITC*, 946 F.2d at 832, 20 USPQ2d at 1171. There was testimony concerning the effect of the omission by SMC of one of the four rings, and the effect of the location of the omitted ring distal from the pressure medium. Festo presented testimony that the use by SMC of a guiding ring at both ends, retaining the

wiping/sealing ring only at the end adjacent the pressure medium, corresponded to and was equivalent to the claimed ring structure, and that the SMC ring structure would still improve the life of the piston, although not as effectively as would the use of two rings at both ends. Inefficient infringement is still infringement. *Laitram Corp. v. Cambridge Wire Cloth Co.*, 863 F.2d 855, 859, 9 USPQ2d 1289, 1294 (Fed. Cir. 1988), *cert. denied*, 490 U.S. 1068 (1989).

A verdict of infringement must be sustained if reasonable jurors, viewing the evidence as a whole, could have found the facts needed to reach the verdict that was reached, in light of the applicable law. It is our obligation to defer to the trier of fact when we come upon substantial evidence to support the verdict. We neither make our own findings as if there had been no trial, nor attempt to reconstruct the entire trial on a paper record. *Anderson v. City of Bessemer City*, 470 U.S. 564, 573 (1985) (“The reviewing court oversteps the bounds of its duty under Rule 52(a) if it undertakes to duplicate the role of the lower court . . . ‘Appellate courts must constantly have in mind that their function is not to decide factual issues de novo.’”) (quoting *Zenith Radio Corp. v. Hazeltine Research, Inc.*, 395 U.S. 100, 123 (1969)).

Although the differing expert opinions reflect the closeness of the technologic facts, there was substantial evidence whereby a reasonable jury could have found infringement of the Stoll patent in terms of the doctrine of equivalents. *See Transnational Corp. v. Rodio & Ursillo, Ltd.*, 920 F.2d 1066, 1068 (1st Cir. 1990) (“In reviewing the jury verdict, we are compelled even in a close case, to uphold the verdict unless the facts and inferences, when viewed in a light most favorable to the party for whom the jury held, point so strongly and overwhelmingly in favor of the movant that a reasonable jury could not have arrived at

this conclusion.”) (quoting *Chedd-Angier Production Co. v. Omni Publications Int’l Ltd.*, 756 F.2d 930, 934 (1st Cir. 1985)).

## B. PROSECUTION HISTORY ESTOPPEL

The issue of prosecution history estoppel is raised by SMC on appeal. At trial, counsel correctly stated that “This is not really a prosecution history estoppel case.” Counsel argues that it is now our obligation to determine the scope and meaning of claim terms de novo. Indeed *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 970-71, 34 USPQ2d 1321, 1322 (Fed. Cir. 1995) (en banc ) requires independent determination of the construction of the claims, as a matter of law, unencumbered by the trial process. However, the issue of estoppel, to the extent that it was raised at trial, was aired in extensive testimony by the inventor and by expert witnesses on both sides, all directed to the meaning of “magnetizable material.” Related factual issues were also disputed, such as the reason for the addition of this limitation to the claims.

Festo argues that prosecution history estoppel does not bar a finding of equivalency when a descriptive term in the claim was not required to be included in order to overcome prior art. See *Hilton Davis*, 62 F.3d at 1525, 35 USPQ2d at 1651 (“Nor does prosecution history estoppel preclude application of the doctrine of equivalents in this case. Whenever prosecution history estoppel is invoked as a limitation to infringement under the doctrine of equivalents, a close examination must be made as to, not only what was surrendered, but also the reason for such a surrender.”) (internal quotation marks and citations omitted). As discussed in *Vaupel Textilmaschinen KG v. Meccanica Euro Italia SPA*, 944 F.2d 870, 882, 20 USPQ2d 1045, 1054 (Fed. Cir. 1991), in determining whether prosecution history estoppel applies when there has been a change in claim language during prosecution, the court must consider both

what was changed and the reason for the change. The scope of any asserted estoppel is determined in light of the prior art in the field of art relevant to the change, the statements made to the patent examiner as to the reason for the change, and the purpose of the change as it relates to the allowance of the claims. *See Mannesmann Demag Corp. v. Engineered Metal Prods. Co.*, 793 F.2d 1279, 1284-85, 230 USPQ 45, 48 (Fed. Cir. 1986).

In this case the description of the sleeve as made of magnetizable material was added during prosecution. The reason for the addition was not stated in the prosecution history, was vigorously disputed at trial, and was not at all clear to the trial judge, who called the addition “a mystery.” At the trial there was testimony by the inventor and by experts on both sides, accompanied by extensive argument of counsel. The prosecution record was before the jury, as was the inventor. The trial judge did not hold Festo estopped to argue that there was equivalency between the SMC aluminum alloy sleeve and the claimed magnetizable sleeve. We do not discern error of law in this ruling, and indeed there were before the jury SMC’s arguments on the technologic facts. Also before the jury were the special master’s contrary findings. The special master, as discussed post, had found that there was prosecution history estoppel barring Festo’s assertion of equivalency.

No objection was raised to the district court’s instructions on the law of estoppel, or to the presentation of the broad issue to the jury as part of the evidence relating to infringement. *See Fed. R. Civ. P. 51* (“No party may assign as error the giving or the failure to give an instruction unless that party objects thereto before the jury retires . . .”) We do not discern reversible error in these proceedings. Taking note of the substantial evidence of technologic identity of function, way, and result in the circumstances of actual use wherein the leakage of magnetic flux from the cylinder was

small, and the disputed facts underlying the issue of estoppel, we conclude that the judgment of infringement of the Stoll patent must be sustained.

### C. THE SPECIAL MASTER

SMC argues that the reference to a special master deprived it of the right to trial by jury, in that the master's report was before the jury. SMC also objects that it was required to try the entire case twice, first to the master and then to the jury. We are sympathetic to the burden on the parties and the cost of two trials. However, this was not a matter of simply turning the case over to a master, as SMC argues, for the case was fully tried, and decided, by judge and jury.

The federal courts have certain inherent powers to appoint persons unconnected with the court to aid judges in the performance of specific duties. *Ex parte Peterson*, 253 U.S. 300, 312 (1920) (appointment of auditor to define and simplify the issues); *Constant v. Advanced Micro-Devices, Inc.*, 848 F.2d 1560, 1566-67, 7 USPQ2d 1057, 1060 (Fed. Cir.), *cert. denied*, 488 U.S. 892 (1988) (special master made recommendations on issues of validity and infringement). Consent of the parties is not required. *Peterson*, 253 U.S. at 312-14. SMC states that it objected to the appointment of a master on the ground that trial to the master should not replace the requested jury trial. However, the jury trial was not replaced. A full jury trial was held, except for the issue concerning the Carroll patent that was decided by summary judgment. Rule 53(b) states in part:

Rule 53(b) Reference. A reference to a master shall be the exception and not the rule. In actions to be tried by a jury, a reference shall be made only when the issues are complicated; in actions to be tried without a jury, save in matters of account and of difficult computation of damages, a reference shall

be made only upon a showing that some exceptional condition requires it . . .

The trial judge to whom this case was first assigned deemed the case to be sufficiently complicated to be referred to a special master, to conduct a hearing on the issues of patent validity and infringement and to make recommendations on those issues. The successor trial judge, sharing the view that the issues were complicated, continued the reference. In a non-jury trial, complexity alone does not warrant reference to a master; “On the contrary, we believe that this is an impelling reason for trial before a regular, experienced trial judge rather than before a temporary substitute appointed on an ad hoc basis and not ordinarily experienced in judicial work.” *La Buy v. Howes Leather Co.*, 352 U.S. 249, 259 (1957). However, the strict “exceptional condition” standard of Rule 53(b) relates only to actions tried without a jury. Thus the district court did not abuse its discretion in referring the complex technologic issues of validity and infringement to a special master.

The master apparently conducted a full trial of these issues, and produced a detailed report. Rule 53(e)(3) permits the master’s report to be presented along with other evidence for consideration by the jury:

Rule 53(e)(3) In Jury Actions. In an action to be tried by a jury the master shall not be directed to report the evidence. The master’s findings upon the issues submitted to the master are admissible as evidence of the matters found and may be read to the jury, subject to the ruling of the court upon any objections in point of law which may be made to the report.

*See Crateo, Inc. v. Intermark, Inc.*, 536 F.2d 862, 868 (9th Cir.) (findings of special master are admissible as evidence and may be read to the jury; Rule 53(e)(3) does not require master to personally read findings, or to be made available

for cross-examination), *cert. denied*, 429 U.S. 896 (1976); Peterson, 253 U.S. at 310-11:

The report will, unless rejected by the court, be admitted at the jury trial as evidence of facts and findings embodied therein; but it will be treated, at most, as prima facie evidence thereof. The parties will remain free to call, examine, and cross-examine witnesses as if the report had not been made. No incident of the jury trial is modified or taken away either by the preliminary, tentative hearing before the auditor or by the use to which his report may be put.

SMC states that it objected to the possession of a redacted version of the master's report by the jury, although it agreed that portions of the report could be read to the jury. SMC, Festo, and the judge had previously agreed on the redacted (both sides call it "sanitized") version of the report. We observe that the subject matter remaining in the report related to the technology of the invention and the prior art, and the master's findings and recommendations on the issues of validity and infringement. The master's report favored SMC on the important question of infringement of the Stoll patent, although it favored Festo on the validity issues.

The court allowed the jurors to have a copy of the report, instead of merely reading it to them as stated in the Rule, in light of the complexity of the technologic facts. The copies were to be turned in prior to deliberations, and the jurors were so informed upon distribution of the report. However, apparently not all copies were turned in or collected prior to deliberations. SMC states that this tainted the entire procedure, and requires granting a new trial or setting aside or modifying the verdict.

The district court found that any procedural error was harmless and did not affect the substantial rights of either party. The district court referred to the following factors: (1)

the jurors had notebooks to take notes on the master's report while they were reading it; (2) because various members of the jury finished reading the report on July 11, 12, and 13, the report was fresh in their minds during deliberations on July 14; (3) counsel for both sides commented on the findings in the report during their closing arguments; (4) the court gave clear instructions to the jury that they could give whatever weight they chose to the report and that they, not the special master, were the ultimate fact-finders; and (5) the verdict of the jury disregarded a key finding of the master's report with respect to the magnetizable sleeve, demonstrating that the jury did not actually give the master's report undue weight. Post-Trial Memorandum at 2 (July 26, 1994).

We do not deem the jury trial to have been fatally flawed. The technology was complex, the fine points of patent validity and infringement were complex, and the accounting evidence was complex. All were explained in the master's report, and during the argument reference was made by both parties to the master's findings and explanations. The master's report is evidence, and as such may be referred to in arguments of counsel. Fed. R. Civ. P. 53(e)(3); *Charles A. Wright, Inc. v. F.D. Rich Co.*, 354 F.2d 710, 714 (1st Cir.), *cert. denied*, 384 U.S. 960 (1966). There was testimony of witnesses on the points that had been discussed by the special master. Although the Court has cautioned that a special master must not replace a jury trial, *Dairy Queen, Inc. v. Wood*, 369 U.S. 469, 478 n. 18, 133 USPQ 294, 297 n. 18 (1962); *La Buy*, 352 U.S. at 258, in this case a full jury trial was held.

It is significant that the jury verdict did not track the master's conclusions. Although SMC argues that the jury must have placed undue reliance on the master's conclusions, SMC's counsel told the jury in closing argument:

Judge Saris will instruct you that you can give

whatever weight you desire to this report. I would suggest to you that you give it the maximum weight. He especially considered this point. He was certainly very knowledgeable concerning everything that went on. He had an eleven-day trial before him and then he issued a detailed 68-page report in which he concluded that the SMC rodless cylinder did not infringe.

Despite this exhortation, the jury's conclusion as to infringement of the Stoll patent was contrary to the master's conclusion.

On the entirety of the circumstances, we do not believe that SMC's rights to a fair trial were affected by the lapse whereby the jury retained a copy of the master's report during its deliberations. Fed. R. Civ. P. 61 provides:

Rule 61. Harmless Error No error in either the admission or the exclusion of evidence and no error or defect in any ruling or order or in anything done or omitted by the court or by any of the parties is ground for granting a new trial or for setting aside a verdict or for vacating, modifying or otherwise disturbing a judgment or order, unless refusal to take such action appears to the court inconsistent with substantial justice. The court at every stage of the proceeding must disregard any error or defect in the proceeding which does not affect the substantial rights of the parties.

We discern no ground for a new trial flowing from the procedures with respect to the special master.

### III DAMAGES

SMC disputes the damages assessed by the jury. The assessment of damages is a question of fact, and is decided by the jury when trial is to a jury. *Brooktree*, 977 F.2d at

1578, 24 USPQ2d at 1417; *Weinar v. Rollform, Inc.*, 744 F.2d 797, 808, 223 USPQ 369, 375 (Fed. Cir. 1984), *cert. denied*, 470 U.S. 1084, 105 S. Ct. 1844, 85 L. Ed. 2d 143 (1985). The jury's award must be upheld unless the amount is grossly excessive, clearly not supported by the evidence, or based on speculation or guesswork. *Brooktree*, 977 F.2d at 1580, 24 USPQ2d at 1419. To the extent that there were conflicts in the evidence with respect to damages, neither the trial court upon motion for judgment as a matter of law, nor the appellate court, may substitute its findings for those of the jury. *Id.* at 1581, 24 USPQ2d at 1419.

#### A. GENERAL DAMAGES

The general measure of the actual damages of a manufacturing patentee is the lost profits that the patentee would have earned but for the infringement. *Aro Mfg. Co. v. Convertible Top Replacement Co.*, 377 U.S. 476, 507, 141 USPQ 681, 694 (1964); *Del Mar Avionics, Inc. v. Quinton Instrument Co.*, 836 F.2d 1320, 1326, 5 USPQ2d 1255, 1260 (Fed. Cir. 1987). Festo was a manufacturer of the patented product, and presented evidence on the factors of (1) demand for the product, (2) the possible substitution of other products, (3) Festo's manufacturing and marketing capability to fulfill the demand, and (4) the amount of profit Festo would have made on the sales lost due to the infringement. *See Panduit Corp. v. Stahl Bros. Fibre Works, Inc.*, 575 F.2d 1152, 1156, 197 USPQ 726, 729-30 (6th Cir. 1978); *Gyromat Corp. v. Champion Spark Plug Co.*, 735 F.2d 549, 552, 222 USPQ 4, 6 (Fed. Cir. 1984). As discussed in *Rite-Hite Corp. v. Kelley Co.*, 56 F.3d 1538, 1545, 35 USPQ2d 1065, 1069 (Fed. Cir. 1995) (en banc), the *Panduit* factors are a useful (albeit not the only) mode of establishing damages in patent cases. In this case the evidence presented by Festo methodically tracked the *Panduit* factors.

Mr. Horst Saalbach, President of Festo, and Mr. Joachim Scholz, Vice President of Sales and Marketing of

Festo, testified about the demand for magnetically coupled rodless cylinders because of their unique characteristics. Mr. Saalbach and Mr. Scholz testified that mechanical rodless cylinders, and band and cable cylinders, were not acceptable substitutes in the special applications in which magnetically coupled rodless cylinders are used. They provided evidence that Festo and SMC were the only suppliers during the period of infringement. Mr. Saalbach testified that Festo could have accommodated about eight to ten times more business in the rodless cylinder market.

SMC disputed the issue of substitution of other products. The parties also presented conflicting evidence and argument as to the relative prices at which SMC and Festo sold comparable products, and the effect of any price differential on a customer's choice of a non-infringing substitute. SMC relies on *BIC Leisure Prods., Inc. v. Windsurfing Int'l, Inc.*, 1 F.3d 1214, 27 USPQ2d 1671 (Fed. Cir. 1993); however, in *BIC* there were at least fourteen competing manufacturers, whereas in the case at bar Festo and SMC were the only manufacturers. When there is a two-supplier market occupied by the patentee and the infringer, it is reasonable for the jury to infer that the patentee would have made the infringer's sales, absent proof to the contrary. *See State Indus., Inc. v. Mor-Flo Indus., Inc.*, 883 F.2d 1573, 1578, 12 USPQ2d 1026, 1029 (Fed. Cir. 1989), *cert. denied*, 493 U.S. 1022 (1990). On the totality of the evidence, we conclude that a reasonable jury could have found that Festo's damages should be measured by its lost profits due to SMC's infringement.

Mr. Steven Skalak, a CPA from Coopers & Lybrand, provided a detailed analysis of Festo's lost profits, showing the calculations he performed to determine what Festo's profits would have been had there been no infringement by SMC. SMC disputes the measurement of such profits, arguing that Festo had a net loss for its early years, and Festo

responding that these magnetic cylinders were profitable items. Festo states that SMC's accounting witness, Mr. Squire, did not provide an alternative lost profit analysis, or identify any items that should have been included in or excluded from the calculation of Festo's fixed costs. SMC does not disagree. Although SMC now appears to challenge all of Festo's evidence, it is apparent that there was substantial evidence at trial that could support the jury verdict.

#### B. ACCESSORY SALES

SMC states that included in the damages award were lost sales of "accessory" items sold with the magnetically coupled rodless cylinders. In *Rite-Hite*, 56 F.3d at 1550, 35 USPQ2d at 1073 the court stated that "[we do not extend] liability to include items that have essentially no functional relationship to the patented invention and that may have been sold with an infringing device only as a matter of convenience or business advantage."

There was undisputed testimony that the items here at issue could be used only with the patented magnetic cylinders, and had no independent market or use. Mr. Saalbach testified that certain "accessories" are necessary to make the magnetically coupled rodless cylinder operational. Mr. Scholz testified that the accessories that Festo sells "you must have to get this device to do work." Mr. Skalak explained the study he performed to verify Festo's sales of these items with the patented rodless cylinders. Such items, having no market, use, or value separate from the patented cylinders, were properly included in the damages award.

The verdict of damages was supported by substantial evidence and in accordance with law, and must be sustained.

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IV  
CONCLUSION

The district court's judgment is affirmed.

Costs are taxed in favor of Festo.

AFFIRMED.

**UNITED STATES DISTRICT COURT  
DISTRICT OF MASSACHUSETTS**

FESTO CORPORATION,

Plaintiff,

v.

SHOKETSU KINZOKU KOGYO KABUSHIKI  
CO., LTD., a/k/a SMC CORPORATION,  
and SMC PNEUMATICS, INC.,

Defendants.

Civil Action No. 88-1814- PBS

**JUDGMENT**

This Court, sitting with a jury, tried the issues with respect to the validity of two United States patents (the “Stoll”) and “Carroll” patents) owned by Plaintiff Festo Corporation (“Festo”) and the infringement of the Stoll patent by Defendants SMC Corporation and SMC Pneumatics, Inc. (collectively “SMC”), and this Court considered the evidence introduced by the parties and the arguments presented on their behalf. In addition, on July 11, 1994, this Court granted summary judgment on infringement of the Carroll patent with respect to the SMC basic type magnetically coupled rodless cylinder, excluding the 6mm bore size.

Pursuant to the jury verdict rendered on July 14, 1994 regarding validity of both the Stoll and Carroll patents and infringement of the Stoll patent, the summary judgment motion granted by this Court with respect to infringement of the Carroll patent and the jury verdict rendered on July 21, 1994 setting forth the damages based on infringement of these patents, this Court directs entry of judgment as set forth below. It is hereby

ORDERED AND ADJUDGED, that

1. This Court has jurisdiction over the subject matter of this action and over the parties.

2. Plaintiff Festo is the owner by assignment of Stoll United States Patent No. 4,354,125 and Carroll Re-examination Certificate B1 3,779,401 (“the patents in suit”) and of all rights of recovery for infringement thereof.

3. Defendant SMC has manufactured and sold in the United States during the term of the patents in suit, without authority from Festo, CY1 NCY1 series magnetically coupled rodless cylinders, excluding the 6mm bore size.

4. With respect to Stoll U.S. Patent No. 4,354,125, entitled, “Magnetically Coupled Arrangement For A Driving And A Driven Member,” issued October 12, 1982:

- a) SMC has failed to carry its burden of proving Claims 1-3 invalid.
- b) SMC has failed to carry its burden of proving that the Stoll patent is invalid for not disclosing the best mode.
- c) SMC has infringed Claim 1 of the Stoll patent by making, using and selling CY1 and NCY1 series magnetically coupled rodless cylinders, excluding the 6mm bore size.

5. With respect to the Carroll Re-examination Certificate No. B1 3,779,401, entitled, “Pneumatic Device For Moving Articles,” issued October 25, 1988:

- a) SMC has failed to carry its burden of proving Claim 9 invalid.
- b) In accordance with this Court’s July 11, 1994 order, SMC has infringed Claims 9, 5 and 6 of the re-examined Carroll patent by making, using and selling CY1 and NCY1 series, basic type,

magnetically coupled rodless cylinders, excluding the 6mm bore size.

- c) Festo's claim of infringement of the re-examined Carroll patent with respect to SMC's CY1 and NCY1 series, cylinder type, magnetically coupled rodless cylinders is dismissed with prejudice in accordance with this Court's July 11, 1994 order.

6. Effective forty-five (45) days from entry of judgment, in accordance with 35 U.S.C. § 283, SMC Pneumatics, Inc. and SMC Corporation, its officers, agents, servants, employees, and attorneys and those persons in active concert or participation with them who receive actual notice of this judgment by personal service or otherwise, are enjoined and restrained:

- (i) from making, using or selling in the United States any magnetically coupled rodless cylinder which infringes Claim 1 of Plaintiff Festo Corporation's Stoll U.S. Patent No. 4,354,125, including, without limitation, by manufacture, use or sale of CY1 and NCY1 series magnetically coupled rodless cylinders, excluding the 6mm bore size;
- (ii) from doing any act in the United States which actively induces infringement of Claim 1 of Plaintiff Festo Corporation's Stoll U.S. Patent No. 4,354,125.
- (iii) from supplying in or from the United States all or a substantial portion of the components of the Stoll patented invention, where such components are combined in whole or in part, in such manner as to actively induce the combination of such components outside of the United States in a manner that would infringe Claim 1 of Plaintiff Festo

Corporation's Stoll U.S. Patent No. 4,354,125, if such combination occurred within the United States; and

7. Counts II through VI of the Festo Complaint regarding predatory pricing are hereby dismissed with prejudice in accordance with the Decision On Summary Judgment by Judge Mazzone on January 27, 1992.

8. SMC's counterclaim regarding infringement of Miyamoto U.S. Patent No. 4,488,477 entitled "Rodless Cylinder" is hereby dismissed with prejudice.

9. In accordance with 35 U.S.C. § 284, the total amount of damages adequate to compensate Festo for SMC's infringement through December 31, 1993 is \$4,322,456 plus prejudgment interest of \$416,727 for a total of \$4,739,183. This Court shall determine an amount of damages on the same lost profits basis as awarded by the jury to Festo for the period between January 1, 1994 and the date on which a determination on appeal to the Court of Appeals for the Federal Circuit is made or the time for making an appeal to the Court of Appeals for the Federal Circuit has been exhausted. Accordingly, SMC is to provide this Court and Festo, within 30 days after a determination of appeal, sufficient information to carry out a separate accounting for the period identified above which shall be submitted to the Court for making the determination of additional damages. Plaintiff Festo is also entitled to interest on these additional damages in an amount to be determined by this Court.

10. Each party is to bear its own costs and attorneys' fees.

Judgment is hereby entered in favor of Plaintiff Festo Corporation against Defendants SMC Corporation and SMC Pneumatics, Inc. and each of them on the issues of liability and damages.

SO ORDERED.

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/s/ Patti B. Saris  
District Judge

PATTI B. SARIS United States

Dated: October 27, 1994