

285 F.3d 1046, \*; 2002 U.S. App. LEXIS 5171, \*\*;  
62 U.S.P.Q.2D (BNA) 1225

LEXSEE 285 F3D 1046

**JOHNSON & JOHNSTON ASSOCIATES INC., Plaintiff-Appellee, v. R.E.  
SERVICE CO., INC. and MARK FRATER, Defendants-Appellants.**

**99-1076, 99-1179, 99-1180**

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

*285 F.3d 1046; 2002 U.S. App. LEXIS 5171; 62 U.S.P.Q.2D (BNA) 1225*

**March 28, 2002, Decided**

**PRIOR HISTORY:** [\*\*1] Appealed from: United States District Court for the Northern District of California. Judge Charles R. Breyer.

En banc decision superseding panel opinion of January 24, 2001, reported at: *Johnson & Johnston Assocs. v. R.E. Serv. Co.*, 238 F.3d 1347, 2001 U.S. App. LEXIS 4038 (Fed. Cir. 2001).

**DISPOSITION:** Reversed.

**LexisNexis(R) Headnotes**

**COUNSEL:** Donald R. Dunner, Finnegan, Henderson, Farabow, Garrett & Dunner, L.L.P., of Washington, DC, argued for plaintiff-appellee. With him on the brief were Thomas H. Jenkins, and Virginia L. Carron. Of counsel on the brief were Fay E. Morisseau, and Michael R. O'Neill, McDermott, Will & Emery, of Irvine, California. Also of counsel on the brief were and John L. DuPre', Richard A. Wise, and Deirdre E. Sanders, Hamilton, Brook, Smith & Reynolds, P.C., of Lexington, Massachusetts.

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**JUDGES:** Before MAYER, Chief Judge, NEWMAN, Circuit Judge, ARCHER, Senior Circuit Judge, MICHEL, LOURIE, CLEVINGER, RADER, SCHALL, BRYSON, GAJARSA, LINN, DYK, and PROST, Circuit Judges. Opinion of the court filed PER CURIAM, in which Chief Judge MAYER, Senior Circuit Judge ARCHER, and Circuit Judges MICHEL, LOURIE, CLEVINGER, RADER, SCHALL, BRYSON, GAJARSA, LINN, DYK, and PROST join. Concurring opinion filed by Circuit Judge CLEVINGER, in which Circuit Judges LOURIE, SCHALL, GAJARSA, and DYK join. Concurring opinion filed by Circuit [\*\*3] Judge RADER, in which Chief Judge, MAYER joins. Concurring opinion filed by Circuit Judge DYK, in which Circuit Judge LINN joins. Concurring opinion filed by Circuit Judge LOURIE. Dissenting opinion filed by Circuit Judge NEWMAN.

**OPINION:** [\*1048]

PER CURIAM

Johnson and Johnston Associates (Johnston) asserted United States Patent No. 5,153,050 (the 050 patent)

285 F.3d 1046, \*; 2002 U.S. App. LEXIS 5171, \*\*;

62 U.S.P.Q.2D (BNA) 1225

against R.E. Service Co. and Mark Frater (collectively RES). A jury found that RES willfully infringed claims 1 and 2 of the patent under the doctrine of equivalents and awarded Johnston \$ 1,138,764 in damages. Upon entry of judgment, the United States District Court for the Northern District of California further granted Johnston enhanced damages, attorney fees, and expenses. *Johnson & Johnston Assocs. v. R.E. Serv. Co.*, No. C97-04382 CRB (N.D. Cal. 1998). After a hearing before a three-judge panel on December 7, 1999, this court ordered en banc rehearing of the doctrine of equivalents issue, *Johnson & Johnston Assocs. v. R.E. Serv. Co.*, 238 F.3d 1347 (Fed. Cir. 2001), which occurred on October 3, 2001. Because this court concludes that RES, as a matter of law, could not have infringed the 050 patent under [\*\*4] the doctrine of equivalents, this court reverses the district court's judgment of infringement under the doctrine of equivalents, willfulness, damages, attorneys fees, and expenses.

I.

The 050 patent, which issued October 6, 1992, relates to the manufacture of printed circuit boards. Printed circuit boards are composed of extremely thin sheets of conductive copper foil joined to sheets of a dielectric (nonconductive) resin-impregnated material called "prepreg." The process for making multi-layered printed circuit boards stacks sheets of copper foil and prepreg in a press, heats them to melt the resin in the prepreg, and thereby bonds the layers. [\*1049]

In creating these circuit boards, workers manually handle the thin sheets of copper foil during the layering process. Without the invention claimed in the 050 patent, stacking by hand can damage or contaminate the fragile foil, causing discontinuities in the etched copper circuits. The 050 patent claims an assembly that prevents most damage during manual handling. The invention adheres the fragile copper foil to a stiffer substrate sheet of aluminum. With the aluminum substrate for protection, workers can handle the assembly without damaging [\*\*5] the fragile copper foil. After the pressing and heating steps, workers can remove and even recycle the aluminum substrate. Figure 5 of the 050 patent shows the foil-substrate combination, with the foil layer peeled back at one corner for illustration:

[SEE FIGURE 5 IN ORIGINAL]

Surface **Ci** is the protected inner surface of the copper foil; **Ai** is the inner surface of the aluminum substrate. A band of flexible adhesive **40** joins the substrate and the foil at the edges, creating a protected central zone **CZ**. The specification explains:

Because the frail, thin copper foil C was adhesively secured to its aluminum substrate A, the [laminate] is stiffer and

more readily handled resulting in far fewer spoils due to damaged copper foil.

The use of the adhered substrate A, regardless of what material it is made of, makes the consumer's (manufacturer's) objective of using thinner and thinner foils and ultimately automating the procedure more realistic since the foil, by use of the invention, is no longer [\*1050] without the much needed physical support.

050 patent, col. 8, ll. 21-30. The specification further describes the composition of the substrate [\*\*6] sheet:

While aluminum is currently the preferred material for the substrate, other metals, such as stainless steel or nickel alloys, may be used. In some instances . . . polypropylene [sic] can be used.

050 patent, col. 5, ll. 5-8.

As noted, the jury found infringement of claims 1 and 2:

Claim 1. A component for use in manufacturing articles such as printed circuit boards comprising:

a laminate constructed of a sheet of copper foil which, in a finished printed circuit board, constitutes a functional element and a sheet of aluminum which constitutes a discardable element;

one surface of each of the copper sheet and the aluminum sheet being essentially uncontaminated and engageable with each other at an interface,

a band of flexible adhesive joining the uncontaminated surfaces of the sheets together at their borders and defining a substantially uncontaminated central zone inwardly of the edges of the sheets and unjoined at the interface.

050 patent, Claim 1, col. 8, ll. 47-60 (emphasis supplied). Claim 2 defines a similar laminate having sheets of copper foil adhered to both sides of the aluminum sheet.

The Northern District [\*\*7] of California has patiently handled litigation between these parties over the 050 patent for many years. In prior litigation, a jury

285 F.3d 1046, \*; 2002 U.S. App. LEXIS 5171, \*\*;

62 U.S.P.Q.2D (BNA) 1225

found that RES had willfully infringed the 050 patent. The district court entered the judgment under *Fed. R. Civ. P. 54(b)*. *R.E. Serv. Co. v. Johnson & Johnston Assocs.*, No. C-92-20672 RPA, slip op. (N.D. Cal. Jul. 29, 1994). Later the district court enforced this judgment against RES in contempt proceedings. *R.E. Serv. Co. v. Johnson & Johnston Assocs.*, No. C-92-20672 RPA, slip op. at 53-54 (N.D. Cal. Jan. 25, 1995) (Order Re Contempt); *R.E. Serv. Co. v. Johnson & Johnston Assocs.*, No. C-92-20672 RPA, slip op. at 53-54 (N.D. Cal. Sept. 6, 1995) (Order Re: Second Contempt). Ultimately the parties settled these disputes. *R.E. Serv. Co. v. Johnson & Johnston Assocs.*, No. C-92-20672 RPA, slip op. at 3 (N.D. Cal. Nov. 1, 1995) (Stipulated Order Enjoining Further Manufacture, Use or Sale and Final Judgment).

In 1997, RES began making new laminates for manufacture of printed circuit boards. The RES products, designated "SC2" and "SC3," joined copper foil to a sheet of steel as the substrate instead of a sheet of aluminum. Johnston filed a **[\*\*8]** suit for infringement. See *R.E. Serv. Co. v. Johnson & Johnston Assocs.*, 1998 U.S. Dist. LEXIS 20235, at \*1 No. C-97-04382 CRB (N.D. Cal. Dec. 23, 1998). In this case, the district court granted RES's motion for summary judgment of no literal infringement. *R.E. Serv. Co. v. Johnson & Johnston Assocs.*, 1998 U.S. Dist. LEXIS 13142, No. C-97-04382 CRB, slip op. (N.D. Cal. Aug. 24, 1998). With respect to the doctrine of equivalents, RES argued, citing *Maxwell v. J. Baker, Inc.*, 86 F.3d 1098, 39 U.S.P.Q.2D (BNA) 1001 (*Fed. Cir.* 1996), that the 050 specification, which disclosed a steel substrate but did not claim it, constituted a dedication of the steel substrate to the public. Johnston argued that the steel substrate was not dedicated to the public, citing *YBM Magnex, Inc. v. Int'l Trade Comm'n*, 145 F.3d 1317, 46 U.S.P.Q.2D (BNA) 1843 (*Fed. Cir.* 1998). On cross-motions for summary judgment, the district court ruled that the 050 patent did not dedicate the steel substrate to the public, and set the question of infringement by equivalents for **[\*1051]** trial, along with the issues of damages and willful infringement. *R.E. Serv. Co. v. Johnson & Johnston Assocs.*, No. C-97-04382 CRB, slip op. (N.D. Cal. Aug. 24, 1998). **[\*\*9]**

The jury found RES liable for willful infringement under the doctrine of equivalents and awarded Johnston \$ 1,138,764 in damages. *R.E. Serv. Co. v. Johnson & Johnston Assocs.*, No. C-97-04382 CRB, at \*5 (N.D. Cal. Dec. 23, 1998) (noting the Oct. 22, 1998 jury verdict). Exercising its discretion under 35 U.S.C. § 284, the district court enhanced Johnston's damages -- doubling the jury's assessment for lost profits and reasonable royalties, but not for price erosion. *R.E. Serv. Co. v. Johnson & Johnston Assocs.*, No. C-97-04382 CRB, slip op. (N.D. Cal. Nov. 30, 1998). The court also awarded attorney fees and expenses under 35 U.S.C. § 285. *Id.*

## II.

On appeal, RES does not challenge the jury's factual finding of equivalency between the copper-steel and copper-aluminum laminates. Instead, citing Maxwell, RES argues that Johnston did not claim steel substrates, but limited its patent scope to aluminum substrates, thus dedicating to the public this unclaimed subject matter. On this ground, RES challenges the district court's denial of its motion for summary judgment that RES's copper-steel laminates are not equivalent, **[\*\*10]** as a matter of law, to the claimed copper-aluminum laminates. Johnston responds that the steel substrates are not dedicated to the public, citing YBM Magnex. In other words, the two parties dispute whether Maxwell or YBM Magnex applies in this case with regard to infringement under the doctrine of equivalents.

In Maxwell, the patent claimed a system for attaching together a mated pair of shoes. 86 F.3d at 1101-02. Maxwell claimed fastening tabs between the inner and outer soles of the attached shoes. Maxwell disclosed in the specification, but did not claim, fastening tabs that could be "stitched into a lining seam of the shoes." U.S. Patent No. 4,624,060, col. 2, l. 42. Based on the "well-established rule that 'subject matter disclosed but not claimed in a patent application is dedicated to the public,'" this court held that Baker could not, as a matter of law, infringe under the doctrine of equivalents by using the disclosed but unclaimed shoe attachment system. *Maxwell*, 86 F.3d at 1106 (quoting *Unique Concepts, Inc. v. Brown*, 939 F.2d 1558, 1562-63, 19 U.S.P.Q.2D (BNA) 1500, 1504 (*Fed. Cir.* 1991)). This court stated further: **[\*\*11]**

By [Maxwell's failure] to claim these alternatives, the Patent and Trademark Office was deprived of the opportunity to consider whether these alternatives were patentable. A person of ordinary skill in the shoe industry, reading the specification and prosecution history, and interpreting the claims, would conclude that Maxwell, by failing to claim the alternate shoe attachment systems in which the tabs were attached to the inside shoe lining, dedicated the use of such systems to the public.

*Maxwell*, 86 F.3d at 1108.

In YBM Magnex, the patent claimed a permanent magnet alloy comprising certain elements, including "6,000 to 35,000 ppm oxygen." U.S. Patent No. 4,588,439 (the 439 patent), col. 3, l. 12. The accused infringer used similar magnet alloys with an oxygen content between 5,450 and 6,000 ppm (parts per million), which was allegedly disclosed but not claimed in the 439

285 F.3d 1046, \*; 2002 U.S. App. LEXIS 5171, \*\*;

62 U.S.P.Q.2D (BNA) 1225

patent. In *YBM Magnex*, this court stated that Maxwell did not create a new rule of law that doctrine of equivalents could never encompass subject matter disclosed in the specification but not claimed. *145 F.3d at 1321*. [\*1052] Distinguishing Maxwell, this [\*12] court noted:

Maxwell avoided examination of the unclaimed alternative, which was distinct from the claimed alternative. In view of the distinctness of the two embodiments, both of which were fully described in the specification, the Federal Circuit denied Maxwell the opportunity to enforce the unclaimed embodiment as an equivalent of the one that was claimed.

*Id. at 1320*. In other words, this court in *YBM Magnex* purported to limit Maxwell to situations where a patent discloses an unclaimed alternative distinct from the claimed invention. Thus, this court must decide whether a patentee can apply the doctrine of equivalents to cover unclaimed subject matter disclosed in the specification.

### III.

Both the Supreme Court and this court have adhered to the fundamental principle that claims define the scope of patent protection. See, e.g., *Aro Mfg. v. Convertible Top Replacement Co.*, 365 U.S. 336, 339, 5 L. Ed. 2d 592, 81 S. Ct. 599 (1961) ("The claims made in the patent are the sole measure of the grant . . ."); *Cont'l Paper Bag Co. v. E. Paper Bag Co.*, 210 U.S. 405, 419, 52 L. Ed. 1122, 28 S. Ct. 748 (1908) [\*13] ("The claims measure the invention."); *Atl. Thermoplastics Co. v. Faytex Corp.*, 974 F.2d 1299, 1300, 24 U.S.P.Q.2D (BNA) 1138, 1139-40 (Fed. Cir. 1992) ("The claims alone define the patent right."); *SRI Int'l v. Matsushita Elec. Corp.*, 775 F.2d 1107, 1121, 227 U.S.P.Q. (BNA) 577, 585 (Fed. Cir. 1985) ("It is the claims that measure the invention."). The claims thus give notice of the scope of patent protection. See, e.g., *Mahn v. Harwood*, 112 U.S. 354, 361, 28 L. Ed. 665, 5 S. Ct. 174 (1884) ("The public is notified and informed by the most solemn act on the part of the patentee, that his claim to invention is for such and such an element or combination, and for nothing more."). The claims give notice both to the examiner at the U.S. Patent and Trademark Office during prosecution, and to the public at large, including potential competitors, after the patent has issued.

Consistent with its scope definition and notice functions, the claim requirement presupposes that a patent applicant defines his invention in the claims, not in the specification. After all, the claims, not the specification, provide the measure of the patentee's right to exclude. [\*14] *Milcor Steel Co. v. George A. Fuller Co.*, 316 U.S. 143, 146, 86 L. Ed. 1332, 62 S. Ct. 969

(1942) ("Out of all the possible permutations of elements which can be made from the specifications, he reserves for himself only those contained in the claims.") (quoting *Milcor Steel Co. v. George A. Fuller Co.*, 122 F.2d 292, 294 (2d Cir. 1941)); *Cont'l Paper Bag*, 210 U.S. at 419 ("The invention, of course, must be described and the mode of putting it to practical use, but the claims measure the invention."); *McClain v. Ortmyer*, 141 U.S. 419, 424, 35 L. Ed. 800, 12 S. Ct. 76 (1891) ("The claim is the measure of his right to relief, and while the specification may be referred to to limit the claim, it can never be made available to expand it."); *SRI Int'l*, 775 F.2d at 1121, n.14 ("Specifications teach. Claims claim.").

Moreover, the law of infringement compares the accused product with the claims as construed by the court. Infringement, either literally or under the doctrine of equivalents, does not arise by comparing the accused product "with a preferred embodiment described in the specification, or with [\*15] a commercialized embodiment of the patentee." *SRI Int'l*, 775 F.2d at 1121.

Even as early as the 1880s, the Supreme Court emphasized the predominant role of [\*1053] claims. For example, in *Miller v. Brass Co.*, a case addressing a reissue patent filed fifteen years after the original patent, the Supreme Court broadly stated: "The claim of a specific device or combination, and an omission to claim other devices or combinations apparent on the face of the patent, are, in law, a dedication to the public of that which is not claimed." *104 U.S. (14 Otto) 350, 352, 26 L. Ed. 783 (1881)*. Just a few years later, the Court repeated that sentiment in another reissue patent case: "The claim actually made operates in law as a disclaimer of what is not claimed; and of all this the law charges the patentee with the fullest notice." *Mahn*, 112 U.S. at 361. The Court explained further:

Of course, what is not claimed is public property. The presumption is, and such is generally the fact, that what is not claimed was not invented by the patentee, but was known and used before he made his invention. But, whether so or not, his own act has made it public property if [\*16] it was not so before. The patent itself, as soon as it is issued, is the evidence of this. The public has the undoubted right to use, and it is to be presumed does use, what is not specifically claimed in the patent.

*Id. at 361*.

The doctrine of equivalents extends the right to exclude beyond the literal scope of the claims. The Supreme Court first applied the modern doctrine of equivalents in *Graver Tank & Mfg. Co. v. Linde Air*

285 F.3d 1046, \*; 2002 U.S. App. LEXIS 5171, \*\*;

62 U.S.P.Q.2D (BNA) 1225

Prods. Co. (Graver II). In that case, the Court explained: "equivalency must be determined against the context of the patent, the prior art, and the particular circumstances of the case." 339 U.S. 605, 609, 70 S. Ct. 854, 94 L. Ed. 1097 (1950). In Graver I, a predecessor case addressing the validity of the claims at issue, the Court held invalid composition claims 24 and 26 comprising "silicates" and "metallic silicates." *Graver Tank & Mfg. v. Linde Air Prods. Co.*, 336 U.S. 271, 276-77, 93 L. Ed. 672, 69 S. Ct. 535 (1949) (Graver I). Specifically, the Court found those claims too broad because they encompassed some inoperative silicates along with the nine operative metallic silicates in the specification. *Id.* at 276. [\*\*17] The Court did not hold invalid narrower claims comprising "alkaline earth metals."

Thus, in the infringement action of Graver II, the Supreme Court addressed only the narrower claims comprising "alkaline earth metals." The alleged infringing compositions in Graver II are similar to the compositions of the narrower claims, except that they substitute silicate of manganese -- a metallic silicate such as in the earlier invalidated claims -- for silicates of "alkaline earth metals" (e.g., magnesium or calcium) claimed in the narrower claims. Because the Court determined that "under the circumstances the change was so insubstantial," and because the accused compositions "performed substantially the same function in substantially the same way to obtain the same result," the Court upheld the finding of infringement under the doctrine of equivalents. *Graver II*, 339 U.S. at 608-10 (quoting *Sanitary Refrigerator Co. v. Winters*, 280 U.S. 30, 42, 74 L. Ed. 147, 50 S. Ct. 9 (1929)). The Court's holding and the history of Graver II show that the patentee had not dedicated unclaimed subject matter to the public. In fact, the patentee had claimed the [\*\*18] "equivalent" subject matter, even if the Court eventually held the relevant claims too broad. n1

n1 This court respectfully disagrees with the statement in the dissent that: "There was no claim to manganese silicate." As earlier explained, composition claims 24 and 26 comprising "silicates" and "metallic silicates" were broad enough to encompass manganese silicate. Therefore, our holding today is in no way in conflict with Graver Tank. Nor does this court agree that intent plays any role in the Maxwell rule. To the contrary, one of the advantages of the Maxwell rule is that it is a purely objective test. The patentee's subjective intent is irrelevant to determining whether unclaimed subject matter has been disclosed and therefore dedicated to the public.

[\*1054]

In 1997, less than a year after this court decided Maxwell, the Supreme Court addressed the doctrine of equivalents again in *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 137 L. Ed. 2d 146, 117 S. Ct. 1040. In that [\*\*19] case, Warner-Jenkinson invited the Court "to speak the death" of the doctrine of equivalents. *Id.* at 21. The Court declined that invitation. In Warner-Jenkinson, the patentee added the phrase "at a pH from approximately 6.0 to 9.0" to claim 1 during prosecution. *Id.* at 22. The alleged infringer operated its ultrafiltration process at a pH of 5.0. *Id.* at 23. The Supreme Court stated that "while a lower limit of [pH] 6.0, by its mere inclusion, became a material element of the claim, that did not necessarily preclude the application of the doctrine of equivalents as to that element." *Id.* at 32 (emphasis omitted). On remand, the Supreme Court instructed this court to determine the patentee's reason, if any, for adding the lower pH limit of 6.0 during prosecution.

The patent at issue in Warner-Jenkinson did not disclose or suggest an ultrafiltration process where the pH of the reaction mixture was 5.0. *Hilton Davis Chem. Co. v. Warner-Jenkinson Co.*, 114 F.3d 1161, 1164 (Fed. Cir. 1997). In fact, the specification practically repeated the claim language: "it is preferred to adjust the pH to [\*\*20] approximately 6.0 to 8.0 before passage through the ultrafiltration membrane." U.S. Patent No. 4,560,746, col. 7, ll. 59-61 (emphasis added). Thus, Warner-Jenkinson did not present an instance of the patentee dedicating subject matter to the public in its specification. In 1998, less than a year later, this court decided YBM Magnex.

V.

As stated in Maxwell, when a patent drafter discloses but declines to claim subject matter, as in this case, this action dedicates that unclaimed subject matter to the public. Application of the doctrine of equivalents to recapture subject matter deliberately left unclaimed would "conflict with the primacy of the claims in defining the scope of the patentee's exclusive right." *Sage Prods. Inc. v. Devon Indus., Inc.*, 126 F.3d 1420, 1424, 44 U.S.P.Q.2D (BNA) 1103, 1107 (Fed. Cir. 1997) (citing *Warner-Jenkinson*, 520 U.S. at 29); see also *Conopco, Inc. v. May Dep't Stores Co.*, 46 F.3d 1556, 1562, 32 U.S.P.Q.2D (BNA) 1225, 1228 (Fed. Cir. 1994) ("The doctrine of equivalents cannot be used to erase 'meaningful structural and functional limitations of the claim on which the public is entitled to rely in avoiding [\*\*21] infringement.'" (internal citations omitted)); *Charles Greiner & Co. v. Mari-Med Mfg., Inc.*, 962 F.2d 1031, 1036 (Fed. Cir. 1992) ("Most important, however, a court must, in applying the doctrine, avoid significant conflict with the fundamental principle that claims define the limits of patent protection.").

Moreover, a patentee cannot narrowly claim an

285 F.3d 1046, \*; 2002 U.S. App. LEXIS 5171, \*\*;

62 U.S.P.Q.2D (BNA) 1225

invention to avoid prosecution scrutiny by the PTO, and then, after patent issuance, use the doctrine of equivalents to establish infringement because the specification discloses equivalents. "Such a result would merely encourage a patent applicant to present a broad disclosure in the specification of the application and file [\*1055] narrow claims, avoiding examination of broader claims that the applicant could have filed consistent with the specification." *Maxwell*, 86 F.3d at 1107 (citing *Genentech, Inc. v. Wellcome Found. Ltd.*, 29 F.3d 1555, 1564, 31 U.S.P.Q.2D (BNA) 1161, 1167 (Fed. Cir. 1994)). By enforcing the Maxwell rule, the courts avoid the problem of extending the coverage of an exclusive right to encompass more than that properly examined by the PTO. *Keystone Bridge Co. v. Phoenix Iron Co.*, 95 U.S. 274, 278, 24 L. Ed. 344 (1877) [\*22] ("The courts have no right to enlarge a patent beyond the scope of its claim as allowed by the Patent Office, or the appellate tribunal to which contested applications are referred.").

#### IV.

In this case, Johnston's 050 patent specifically limited the claims to "a sheet of aluminum" and "the aluminum sheet." The specification of the 050 patent, however, reads: "While aluminum is currently the preferred material for the substrate, other metals, such as stainless steel or nickel alloys may be used." Col. 5, ll. 5-10. Having disclosed without claiming the steel substrates, Johnston cannot now invoke the doctrine of equivalents to extend its aluminum limitation to encompass steel. Thus, Johnston cannot assert the doctrine of equivalents to cover the disclosed but unclaimed steel substrate. To the extent that YMB Magnex conflicts with this holding, this en banc court now overrules that case.

A patentee who inadvertently fails to claim disclosed subject matter, however, is not left without remedy. Within two years from the grant of the original patent, a patentee may file a reissue application and attempt to enlarge the scope of the original claims to include the disclosed but [\*23] previously unclaimed subject matter. 35 U.S.C. § 251 (2000). In addition, a patentee can file a separate application claiming the disclosed subject matter under 35 U.S.C. § 120 (2000) (allowing filing as a continuation application if filed before all applications in the chain issue). Notably, Johnston took advantage of the latter of the two options by filing two continuation applications that literally claim the relevant subject matter. n2

n2 These applications issued as U.S. Patent Nos. 5,725,937 (the 937 patent) and 5,674,596 (the 596 patent) on March 10, 1998 and October 7, 1997, respectively. Claims 3 and 6 of the 596 patent claim "a metal substrate sheet," while

independent claims of the 937 patent claim "a sheet of stainless steel."

#### CONCLUSION

For the reasons stated above, the district court erred as a matter of law in concluding that RES infringed the 050 patent under the doctrine of equivalents by using a steel substrate. Consequently, this court reverses [\*24] the district court's judgment of infringement under the doctrine of equivalents, the judgment of willful infringement, as well as the award of enhanced damages and attorney fees and expenses.

#### COSTS

Each party shall bear its own costs.

#### REVERSED

**CONCURBY:** CLEVINGER; RADER; DYK; LOURIE

**CONCUR:** CLEVINGER, Circuit Judge, with whom Circuit Judges LOURIE, SCHALL, GAJARSA, DYK join, concurring.

Judge Newman has a different view of this case than I do. It is incorrect to characterize our decision today as announcing a new rule. It is equally incorrect to characterize our decision today as a mutinous act in the light of the Supreme [\*1056] Court's decision in *Graver Tank & Manufacturing Co. v. Linde Air Products Co.*, 339 U.S. 605, 94 L. Ed. 1097, 70 S. Ct. 854 (1950). For the reasons stated in the opinions for the court and by Judge Dyk, our decision is not inconsistent with *Graver Tank*.

We did not take the case en banc to make new law. The law followed by the court in this case is old law. This law was old law when we decided *Maxwell v. J. Baker, Inc.*, 86 F.3d 1098 (Fed. Cir. 1996), for the reasons so aptly stated in the Maxwell opinion. [\*25] *Id.* at 1106-07. We took this case en banc because the parties and the district court perceived conflict between Judge Lourie's opinion for the court in Maxwell and Judge Newman's opinion for the court in a later case, *YBM Magnex, Inc. v. International Trade Commission*, 145 F.3d 1317 (Fed. Cir. 1998).

An important task of this court is to ensure uniformity in the application of our precedent. We perform this task when we reassure the district courts and the bar that our previous decision in Maxwell states the correct rule. For the reasons stated in the court's opinion in this case, it is not possible for the older holding in Maxwell to live comfortably with the newer holding in YBM Magnex. Our choice in this case was simple: whether to overrule Maxwell or YBM Magnex.

285 F.3d 1046, \*; 2002 U.S. App. LEXIS 5171, \*\*;

62 U.S.P.Q.2D (BNA) 1225

RADER, Circuit Judge, with whom MAYER, Chief Judge, joins, concurring.

While endorsing the results and reasoning of the court, I would offer an alternative reasoning. This alternative would also help reconcile the preeminent notice function of patent claims with the protective function of the doctrine of equivalents. This reconciling principle [\*\*26] is simple: the doctrine of equivalents does not capture subject matter that the patent drafter reasonably could have foreseen during the application process and included in the claims. This principle enhances the notice function of claims by making them the sole definition of invention scope in all foreseeable circumstances. This principle also protects patentees against copyists who employ insubstantial variations to expropriate the claimed invention in some unforeseeable circumstances.

Few problems have vexed this court more than articulating discernible standards for non-textual infringement. On the one hand, the Supreme Court has recognized that the doctrine of equivalents provides essential protection for inventions: "To permit imitation of a patented invention which does not copy every literal detail would be to convert the protection of the patent grant into a hollow and useless thing . . . leaving room for - indeed encouraging - the unscrupulous copyist to make unimportant and insubstantial changes." *Graver Tank & Mfg. Co. v. Linde Air Prods. Co.*, 339 U.S. 605, 607, 94 L. Ed. 1097, 70 S. Ct. 854 (1950). The protective function of non-textual infringement, [\*\*27] however, has a price. Recently, the Supreme Court acknowledged that a broad doctrine of equivalents can threaten the notice function of claims: "There can be no denying that the doctrine of equivalents, when applied broadly, conflicts with the definitional and public-notice functions of the statutory claiming requirement." *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 29, 137 L. Ed. 2d 146, 117 S. Ct. 1040 (1997). These competing policies make it difficult to set a standard that protects the patentee against insubstantial changes while simultaneously providing the public with adequate notice of potentially infringing behavior.

In general, the Supreme Court and this court have attempted to deal with these competing principles by placing limits on non-textual infringement. Thus, in furtherance [\*\*1057] of the notice objective, Pennwalt and Warner-Jenkinson require an equivalent for each and every element of a claim (applying the doctrine of equivalents to the claim as a whole gives too much room to enforce the claim beyond its notifying limitations). *Pennwalt Corp. v. Durand-Wayland, Inc.*, 833 F.2d 931, 935, 4 U.S.P.Q.2D (BNA) 1737, 1740 (Fed. Cir. 1987) [\*\*28] (citing *Lemelson v. United States*, 752 F.2d 1538, 1551, 224 U.S.P.Q. (BNA) 526, 533 (Fed. Cir. 1985)); *Warner-Jenkinson*, 520 U.S. at 40. Similarly, to enhance

notice, Festo and Warner-Jenkinson propose to bar patentees from expanding their claim to embrace subject matter surrendered during the patent acquisition process. *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 234 F.3d 558, 564-65, 56 U.S.P.Q.2D (BNA) 1865, 1868-70 (Fed. Cir. 2000); *Warner-Jenkinson*, 520 U.S. at 34. Finally, *Wilson Sporting Goods* prevents the doctrine of equivalents from expanding claim scope to embrace prior art. *Wilson Sporting Goods Co. v. David Geoffrey & Assocs.*, 904 F.2d 677, 683, 14 U.S.P.Q.2D (BNA) 1942, 1947-48 (Fed. Cir. 1990).

Perhaps more than each of these other restraints on non-textual infringement, a foreseeability bar would concurrently serve both the predominant notice function of the claims and the protective function of the doctrine of equivalents. When one of ordinary skill in the relevant art would foresee coverage of an invention, a patent drafter has an obligation to claim those foreseeable limits. This [\*\*29] rule enhances the notice function of claims by making them the sole definition of invention scope in all foreseeable circumstances. When the skilled artisan cannot have foreseen a variation that copyists employ to evade the literal text of the claims, the rule permits the patentee to attempt to prove that an "insubstantial variation" warrants a finding of non-textual infringement. In either event, the claims themselves and the prior art erect a foreseeability bar that circumscribes the protective function of non-textual infringement. Thus, foreseeability sets an objective standard for assessing when to apply the doctrine of equivalents.

A foreseeability bar thus places a premium on claim drafting and enhances the notice function of claims. To restate, if one of ordinary skill in the relevant art would reasonably anticipate ways to evade the literal claim language, the patent applicant has an obligation to cast its claims to provide notice of that coverage. In other words, the patentee has an obligation to draft claims that capture all reasonably foreseeable ways to practice the invention. The doctrine of equivalents would not rescue a claim drafter who does not provide such notice. [\*\*30] Foreseeability thus places a premium on notice while reserving a limited role for the protective function of the doctrine of equivalents.

This court actually already has articulated this foreseeability principle in the context of the doctrine of equivalents. Six months after the Supreme Court decided *Warner-Jenkinson*, this court decided *Sage Prods. Inc. v. Devon Indus., Inc.*, 126 F.3d 1420, 44 U.S.P.Q.2D (BNA) 1103 (Fed. Cir. 1997). In that case, this court found no infringement, either literally or under the doctrine of equivalents, of a patent on a disposal system for sharp medical instruments. *Id.* at 1421. When addressing the doctrine of equivalents issue, this court applied the foreseeability bar:

285 F.3d 1046, \*; 2002 U.S. App. LEXIS 5171, \*\*;

62 U.S.P.Q.2D (BNA) 1225

The claim at issue defines a relatively simple structural device. A skilled patent drafter would foresee the limiting potential of the "over said slot" limitation. No subtlety of language or complexity of the technology, nor any subsequent change in the state of the art, such as later-developed technology, obfuscated the significance of this limitation at [\*1058] the time of its incorporation into the claim. If Sage desired broad patent protection for [\*31] any container that performed a function similar to its claimed container, it could have sought claims with fewer structural encumbrances. Had Sage done so, then the Patent and Trademark Office (PTO) could have fulfilled its statutory role in helping to ensure that exclusive rights issue only to those who have, in fact, contributed something new, useful, and unobvious. Instead, Sage left the PTO with manifestly limited claims that it now seeks to expand through the doctrine of equivalents. However, as between the patentee who had a clear opportunity to negotiate broader claims but did not do so, and the public at large, it is the patentee who must bear the cost of its failure to seek protection for this foreseeable alteration of its claimed structure.

*Id.* at 1425 (emphasis added; footnotes and citations omitted). The Sage court emphasized that a "skilled patent drafter would foresee the limiting potential of the 'over the slot' limitation." *Id.* Thus, the court barred application of the doctrine of equivalents "for this foreseeable alteration of [the] claimed structure." *Id.*

In Sage, this court also noted specifically some types of subject [\*32] matter that may not be foreseeable during the application process - subject matter arising from a "subsequent change in the state of the art, such as later-developed technology," *id.*; see also *Warner-Jenkinson*, 520 U.S. at 37 (noting that the doctrine extends to after-arising technology); *Al-Site Corp. v. VSI Int'l, Inc.*, 174 F.3d 1308, 1320, 50 U.S.P.Q.2D (BNA) 1161, 1168 (Fed. Cir. 1999) ("An 'after-arising' technology could thus infringe under the doctrine of equivalents without infringing literally as a § 112, P 6 equivalent."); *Pennwalt*, 833 F.2d at 938 ("The facts here do not involve later-developed computer technology which should be deemed within the scope of the claims to avoid the pirating of an invention."), or subject matter cloaked by the "subtlety of language or complexity of the technology," 126 F.3d at 1425; see also *Mahn v. Harwood*, 112 U.S. 354, 361, 28 L. Ed. 665, 5 S. Ct. 174

(1884) ("If the specification is complicated and the claim is ambiguous or involved, the patentee may be entitled to greater indulgence; and of this the court can rightfully judge in each case.").

Sage is not the [\*33] only case to acknowledge the value of a foreseeability limit on non-textual infringement. *Fin Control Sys. PTY, Ltd v. OAM, Inc.*, 265 F.3d 1311, 1320-21, 60 U.S.P.Q.2D (BNA) 1203, 1209-10 (Fed. Cir. 2001); *Scimed Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc.*, 242 F.3d 1337, 1346-47, 58 U.S.P.Q.2D (BNA) 1059, 1066-67 (Fed. Cir. 2001); *Zodiac Pool Care, Inc. v. Hoffinger Indus., Inc.*, 206 F.3d 1408, 1416, 54 U.S.P.Q.2D (BNA) 1141, 1147 (Fed. Cir. 2000); *Moore U.S.A, Inc. v. Standard Register Co.*, 229 F.3d 1091, 1106, 56 U.S.P.Q.2D (BNA) 1225, 1235 (Fed. Cir. 2000); *Antonious v. Spalding & Evenflo Cos.*, 44 F. Supp. 2d 732, 738 (D. Md. 1998), *aff'd in part, rev'd in part*, 217 F.3d 849 (Fed. Cir. 1999); *Kinzenbaw v. Deere & Co.*, 741 F.2d 383, 389, 222 U.S.P.Q. (BNA) 929, 933 (Fed. Cir. 1984). In one of those cases, *Kinzenbaw v. Deere & Co.*, this court concluded that the "doctrine of equivalents is designed to protect inventors from unscrupulous copyists . . . and unanticipated equivalents." 741 F.2d at 389 (emphasis added). Referencing a case involving after-arising technology, the Federal [\*34] Circuit did not require the patent applicant to claim "all future developments which enable the practice of [each limitation of] his invention in substantially the same way." *Id.* (quoting *Hughes Aircraft Co. v. United States*, 717 F.2d 1351, 1362, 219 U.S.P.Q. (BNA) 473, 481 (Fed. [\*1059] Cir. 1983) (a case involving after-arising technology, namely microprocessors installed on board a satellite)). In other words, the court acknowledged the role of foreseeability in enforcing the doctrine of equivalents. Nonetheless, prosecution history estoppel precluded the patentee's reliance on non-textual infringement. The court explained further that the variation from the claims was neither copied nor unforeseeable to the patentee at the time of filing. In reaching this result, the court suggested that if variation had been unforeseeable during the application process, the doctrine of equivalents would still have been available to the patentee. *Id.*

Finally, turning more specifically to the issue in this case, in *Maxwell v. J. Baker, Inc.*, 86 F.3d 1098, 39 U.S.P.Q.2D (BNA) 1001 (Fed. Cir. 1996), this court again dealt with the doctrine of equivalents. This court found that "Maxwell [\*35] limited her claims to fastening tabs attached between the inner and outer soles." *Id.* at 1108. This court underscored that one of ordinary skill in the shoe industry would have discerned from reading the patent that the drafter could have foreseen and claimed the alternative shoe attachment system, but declined to do so. *Id.* Thus, this court concluded that Maxwell had dedicated the alternative attachment system to the public. *Id.* While not expressly

285 F.3d 1046, \*; 2002 U.S. App. LEXIS 5171, \*\*;

62 U.S.P.Q.2D (BNA) 1225

invoking foreseeability as in *Sage and Kinzenbaw*, this court relied on the perspective of one of skill in the art, thus suggesting that objective foreseeability adds weight to its foreclosure of equivalents.

In this case, Johnston's 050 patent claimed only a "sheet of aluminum" and "the aluminum sheet" - twice specifying the aluminum limitation. The patent specification then expressly mentioned other potential substrate metals, including stainless steel. col. 5, ll. 5-10. Johnston's patent disclosure expressly admits that it foresaw other metals serving as substrates. Yet the patent did not claim anything beyond aluminum. Foreseeability bars Johnston from recapturing as an equivalent subject matter not **[\*\*36]** claimed but disclosed. In *Sage* terms, "as between [Johnston] who had a clear opportunity to negotiate broader claims but did not do so, and the public at large, it is [Johnston] who must bear the cost of its failure to seek protection for this foreseeable alteration of its claimed structure." *126 F.3d at 1425*.

Foreseeability relegates non-textual infringement to its appropriate exceptional place in patent policy. The doctrine of equivalents should not rescue claim drafters who fail to give accurate notice of an invention's scope in the claims. The Patent Act supplies a correction process for applicants who have claimed "more or less than [they] had a right to claim in the patent." *35 U.S.C. § 251, 252 (2001)*. The doctrine of equivalents need not duplicate the statute's means of correcting claiming errors.

Implicit in the protective function of the doctrine of equivalents is the notion that the patentees could not have protected themselves with reasonable care and foresight. Enforcing this *Sage* principle more aggressively will help achieve a better balance between the notice function of claims and the protective function of non-textual **[\*\*37]** infringement.

DYK, Circuit Judge, with whom LINN, Circuit Judge, joins, concurring.

I join the majority opinion, and write separately only to emphasize further why our decision today is entirely consistent with the Supreme Court's decision in *Graver Tank & Manufacturing Co., Inc. v. Linde Air Products Co.*, *339 U.S. 605, 94 L. Ed. 1097, 70 S. Ct. 854 (1950)* ("*Graver Tank II*"). **[\*1060]**

In the first *Graver Tank* decision, *Graver Tank & Manufacturing Co., Inc. v. Linde Air Products Co.*, *336 U.S. 271, 276-77, 93 L. Ed. 672, 69 S. Ct. 535 (1949)*, the Court approved the district court's decision that composition claims 24 and 26 of U.S. Patent No. *2,043,960* ("the 960 patent") relating to electric welding were invalid on the ground that they were too broad and comprehended more than the invention. The Court also approved the district court's decision that composition

claims 18, 20, 22, and 23 were valid and infringed. *Id. at 275*.

The Court then granted rehearing to reconsider whether the four valid claims 18, 20, 22, and 23 were infringed and whether the doctrine of equivalents applied. *Graver Tank II*, *339 U.S. at 606*. **[\*\*38]** On rehearing, the Court in an opinion by Justice Jackson held that the doctrine of equivalents did in fact apply, and that claims 18, 20, 22, and 23 were infringed under the doctrine of equivalents:

It is difficult to conceive of a case more appropriate for application of the doctrine of equivalents. The disclosures of the prior art made clear that manganese silicate was a useful ingredient in welding compositions. Specialists familiar with the problems of welding compositions understood that manganese was equivalent to and could be substituted for magnesium in the composition of the patented flux and their observations were confirmed by the literature of chemistry.

*Id. at 612* (emphasis added).

Justice Douglas dissented on the ground that the equivalent subject matter had been dedicated to the public: "[The manganese silicate flux] was disclosed in the application and then excluded from the claims. It therefore became public property." *Id. at 618* (Douglas, J., dissenting). See also *id. at 617* (Black, J., dissenting).

Despite Justice Jackson's usual elegance and precision of expression, the majority opinion does **[\*\*39]** not respond to either dissent or explain why there had been no dedication to the public as a result of the disclosures in the specification. As a result, we must look to the facts of the case to determine the scope of the Court's holding in *Graver Tank II*.

The court here explains the consistency of its rule with *Graver Tank II* on the ground that "the patentee had claimed the 'equivalent' subject matter, even if the Court eventually held the relevant claims too broad." Ante at 11. In other words, I understand the majority to say that the dedication rule is a species of conscious waiver. The patentee has control over the drafting of the claims, and if he discloses but omits to claim certain subject matter, he will be held to have waived the right to capture the disclosed matter under the doctrine of equivalents, and to have dedicated it to the public. No such waiver occurs where, as in *Graver Tank II*, the patentee actually claimed the subject matter, even if the particular claims are later held invalid. There is, moreover, in such circumstances far less possibility that the patentee is "gaming" the system, that is, deliberately writing narrow

285 F.3d 1046, \*; 2002 U.S. App. LEXIS 5171, \*\*;  
62 U.S.P.Q.2D (BNA) 1225

claims with the objective [\*\*40] of avoiding a searching PTO examination and recapturing the disclosed subject matter through the doctrine of equivalents. Thus, the majority concludes, and I agree, that Graver Tank II is distinguishable on its facts because the equivalent subject matter in that case (if disclosed) was also claimed.

In addition, I find another significant factual distinction between this case and Graver Tank II. In finding its decision consistent with Graver Tank II, the majority [\*\*1061] here assumes that the Graver Tank II patent did in fact disclose the equivalent subject matter later sought to be covered by the doctrine of equivalents. But a careful examination of the record shows that it did not do so with any clarity. While the district court explicitly found that the Graver Tank II patent disclosed the subject matter sought to be covered by the doctrine of equivalents, n1 this was a matter of some controversy. The invalidated claims of the 960 patent (24 and 26) were general and made no specific reference to the use of manganese. The specification made reference to the possible use of manganese, but it was not clear that the specification actually disclosed that manganese silicate [\*\*41] (or the particular combination reflected in the infringing material) worked for its intended purpose. n2 Thus, this case is factually different from Graver Tank II, in that the clear disclosures present here and in *Maxwell v. J. Baker, Inc.*, 86 F.3d 1098, 1108, 39 U.S.P.Q.2D (BNA) 1001, 1007 (Fed. Cir. 1996) did not exist in Graver Tank II. On this ground our decision here is also consistent with Graver Tank II.

n1 The district court stated:

In the patent the inventors state, "we have used calcium silicate and silicates of sodium, barium, iron, manganese, cobalt, magnesium, nickel and aluminum, both in binary and ternary combinations, in various proportions." Thus, the fact that manganese is a proper substitute for calcium silicate as a major ingredient of the welding composition invented by Jones, Kennedy, and Rotermund is fully disclosed in the specification of their patent. The defendants have urged a construction that would have the sentence in question read, "we have used calcium silicate with or plus silicates of sodium, etc." It is my view that the correct construction of the sentence is, "we have used calcium silicate and also silicates of sodium, etc." That

this is the correct view is borne out by the first application. That document in part recites: " \* \* \* and there are other materials suitable to form the main body of the flux. Magnesium silicate, manganese silicate or these in combination serve admirably. \* \* \* Particular fluxes that we have used are as follows: \* \* \* (2) manganese silicate MnO.SiO[2] \* \* \* ." Accordingly, it is concluded that the patent itself fully discloses that welding compositions composed chiefly of manganese silicate and prepared according to the teachings of the patent are equivalent to those in which the alkaline earth metals are the principal constituents.

*Linde Air Prods. Co. v. Graver Tank & Mfg. Co.*,  
86 F. Supp. 191, 199-200, 75 U.S.P.Q. (BNA)  
231, 238 (N.D. Ind. 1947). [\*\*42]

n2 The relevant portion of the specification stated:

We have used calcium silicate and silicates of sodium, barium, iron, manganese, cobalt, magnesium, nickel and aluminum, both in binary and ternary combinations, in various proportions. . . . While a number of these conductive welding compositions are more or less efficacious in our process, we prefer to use silicates of the alkaline earth metals, such as calcium silicate . . . .

960 patent, col. 3, ll. 62-72.

Finally, quite apart from the factual distinctions of Graver Tank II, it seems highly likely that the Supreme Court did not even consider the question of dedication by disclosure in the specification to be properly before it.

The district court specifically held that the manganese equivalent was allowable because it was disclosed in the specification, stating:

The fact that manganese is a proper substitute for calcium silicate as a major ingredient of the [claimed] welding

285 F.3d 1046, \*; 2002 U.S. App. LEXIS 5171, \*\*;  
62 U.S.P.Q.2D (BNA) 1225

composition . . . is fully disclosed in the specification of their patent.

*Linde Air Prods.*, 86 F. Supp. at 199, 75 U.S.P.Q. (BNA) at 238. [\*\*43]

In the Supreme Court the alleged infringer (the petitioner) urged that the patentee, by not claiming manganese, had dedicated it to the public and that the patentee could not reclaim the manganese [\*1062] by describing it in the specification. While the alleged infringer in passing suggested that a specification disclosure would have been a dedication, n3 this was hardly the focus of its argument. Rather, the alleged infringer concluded that "disclosure in [the] specification of manganese is immaterial." Pet'r Br. at 41. Moreover, argued the alleged infringer, the specification did not disclose manganese as an effective substitute, n4 and, in fact, the patentees "knowingly excluded" the use of manganese silicate from their patent, in order to avoid a PTO finding of anticipation by an earlier patent. Pet'r Br. at 25.

n3 Petitioners' Opening Brief Upon Rehearing at 41, n.32, No. 2, 1949 Term, *Graver Tank & Mfg. Co., Inc. v. Linde Air Prods. Co.*, 339 U.S. 605, 94 L. Ed. 1097, 70 S. Ct. 854 (1950).

n4 Petitioner argued as follows. (The quotations are from the patent; the bracketed materials within the quotes are petitioner's comments):

Note that the specification does not say--as a matter of reading English--what the trial court thought it said. The specification says: "We have used *calcium silicate and silicates* of sodium, barium, iron, manganese, cobalt, magnesium, nickel and aluminum, both in binary and ternary combinations, in various proportions [that is, they say they have used, *not each* of the nine silicates, as the trial court supposed, but calcium silicate *combined with one or two of the other silicates* mentioned, which, as has been seen, their notes show is precisely what they did use]. \* \* \* While a number of these \* \* \* are more or less efficacious [note that, contrary to the trial court's reading of this language, the patentees do not say *all* of the nine

are more or less efficacious, but only that "a number of" them (that is, *some* of them, but not all) are more or less efficacious--meaning, plainly enough, that some are not efficacious at all, but that of the "number of" them which *are* efficacious, some are more efficacious than others--which, again, is precisely what the patentees' notes show] \* \* \* we prefer to use [which again is what their notes show] silicates of the alkaline earth metals, such as calcium silicate."

Pet'r Br. at 20-21.

[\*\*44]

Ironically it was the respondent (the patentee) that argued that the patent disclosed the equivalent subject matter and that the "substitution was expressly taught by the patent as an equivalent composition." n5 See also Resp. Br. at 21 ("[The] substitution [was one that] the patent itself teaches."). n6 The patentee explicitly urged that, because of the disclosure in the specification, "the patentees expected, and these infringers were on notice, that the claims were intended to cover not only the compositions literally within their scope but their equivalents as well." Resp. Br. at 73. The patentee went on to argue that the dedication argument had not been properly raised below.

n5 Respondent's Brief on Rehearing at 11, No. 2, 1949 Term, *Graver Tank & Mfg. Co., Inc. v. Linde Air Prods. Co.*, 339 U.S. 605, 94 L. Ed. 1097, 70 S. Ct. 854 (1950).

n6 So too respondent stated:

Far from having increased the store of knowledge by independent research, petitioners were found guilty of appropriating their flux directly from the text of the patent.

Resp. Br. at 32 (emphasis added).

[\*\*45]

Given this reversal of the expected positions of the parties with respect to whether the specification disclosed the effectiveness of manganese and the significance of such a disclosure, it is hardly surprising that the Supreme Court majority never addressed the issue of dedication by disclosure in the specification. It is likely that the

285 F.3d 1046, \*; 2002 U.S. App. LEXIS 5171, \*\*;

62 U.S.P.Q.2D (BNA) 1225

Supreme Court concluded that the issue of specification disclosure had not been sufficiently raised by the alleged infringer as a ground for rejecting the doctrine of equivalents. (In that connection it is interesting that the Supreme Court found disclosure of manganese in the "prior art" and not in the 960 patent specification itself.) In short, in my view, the better [\*1063] reading of Graver Tank II is that the issue of dedication by specification disclosure simply was not decided. There is thus no holding on this issue that binds this court.

LOURIE, Circuit Judge, concurring.

I fully concur in the result and the opinion of the court. I write separately to comment on Judge Rader's concurrence. First, I commend Judge Rader on his creative effort to advance the discussion concerning the doctrine of equivalents. Certainly, he is correct that [\*\*46] a patent applicant should include in his patent application whatever is within the scope of his inventive concept and is foreseeable. Having myself been a patent lawyer who drafted many patent applications in my time, that is what I believe the overwhelming majority of patent practitioners do. However, I am not convinced that introducing the concept of foreseeability is the answer to the equivalence dilemma.

I do not agree that the concept of foreseeability would simplify equivalence issues and make them more amenable to summary judgment. In fact, it would raise new factual issues. Determining what is foreseeable would often require expert testimony as to what one skilled in the art would have foreseen. How would a trial judge know whether to grant summary judgment other than to make factual findings? What is foreseeable is quite different from what is disclosed in the patent, as in our case here, which is readily determinable. Foreseeability is not solely a question of law.

Moreover, the concept of foreseeability seems akin to obviousness. Assuming that the concepts are similar, and that foreseeability or obviousness precludes equivalence, would not a plaintiff asserting equivalence [\*\*47] have to show that the accused device would not have been obvious, or foreseeable, in order to avoid a finding of nonequivalence? And would not a defendant have to assert that his device was obvious and hence ineligible for equivalence protection in order to escape liability for patent infringement? It seems counterintuitive for a patentee to have to assert that an accused device was nonobvious or for the accused to have to assert that it was obvious. A patentee seeking to establish equivalence wants to show that the accused is merely making a minor variation of his invention, an obvious one, not a nonobvious improvement. One accused of infringement wants to show that he has made an important advance, not that he is a copier, and that his device was obvious over the patented invention, or

foreseeable.

What about the case of a separately patented accused device, which is thus presumptively nonobvious? For such a device to be eligible for equivalence, the improvement therein would have to be found to be not foreseeable, which would seem to run counter to the frequent rubric that equivalence requires substantially the same function, way, and result, a test that is closer to obviousness, [\*\*48] not nonobviousness. Should a manufacturer planning to market a product that is close to the claims of an issued patent have to forego a patent in order to be able to assert that its device would have been obvious, hence foreseeable, and thus not covered by equivalence? That is contrary to the patent policy that encourages an innovator to file for a patent and disclose his invention. Thus, foreseeability creates conflicts with conventional patent law ideas.

If the concepts of foreseeability and obviousness are different, however, we would be inserting new complexity into what is already an amorphous and vague area of the law. That would not be a step forward. [\*1064]

Accordingly, while the idea is an interesting one, I have serious doubts that foreseeability is the answer.

**DISSENTBY: NEWMAN**

**DISSENT: NEWMAN**, Circuit Judge, dissenting.

Instead of deciding this appeal on the basis on which it reaches us -- that is, whether to sustain the jury verdict that stainless steel and aluminum are equivalent substrates for copper foil laminates -- my colleagues launch yet another assault on the doctrine of equivalents. The court today holds that there is no access to equivalency for any subject matter [\*\*49] that is disclosed in a patent specification but not claimed. Thus the court establishes a new absolute bar to equivalency, a bar that applies when there is no prosecution history estoppel, no prior art, no disclaimer, no abandonment.

The court overrules not only its own decisions but also those of the Supreme Court, and reaches out to create a new, unnecessary and often unjust, per se rule. This decision jettisons even the possibility of relief when relief is warranted, and further distorts the long-established balance of policies that undergird patent-supported industrial innovation. It is self-evident that the placement of an increasing number of pitfalls in the path of patentees serves only as a deterrent to innovation. Before taking so deliberate a step, the court should at least consider the consequences. For example, the adverse effect on the disclosure of information in patents -- an immediate and foreseeable result of this ruling -- has not been recognized by any of my colleagues, despite the fervid warnings of the bar.

285 F.3d 1046, \*; 2002 U.S. App. LEXIS 5171, \*\*;

62 U.S.P.Q.2D (BNA) 1225

Even were this court expert in its understanding of technology policy and innovation economics, we have no authority to change the precedent that binds [\*\*50] us. This *en banc* court has placed itself in egregious conflict with the Supreme Court's decisions in *Graver Tank & Mfg. Co. v. Linde Air Prods. Co.*, 339 U.S. 605, 85 U.S.P.Q. (BNA) 328, 94 L. Ed. 1097, 70 S. Ct. 854 (1950) and *Warner-Jenkinson Co. v. Hilton Davis Chemical Co.*, 520 U.S. 17, 41 U.S.P.Q.2D (BNA) 1865, 137 L. Ed. 2d 146, 117 S. Ct. 1040 (1997). The Federal Circuit is no less subject to *stare decisis* than is any other court of appeals. See *Rodriguez de Quijas v. Shearson/American Express, Inc.*, 490 U.S. 477, 484, 104 L. Ed. 2d 526, 109 S. Ct. 1917 (1989) (the courts of appeals should "leave to this Court the prerogative of overruling its own decisions"). Shrugging off this obligation, my intrepid colleagues adopt the position of the dissenters in *Graver Tank*. I must, respectfully, dissent.

### ***Stare Decisis and Supreme Court Precedent***

In *Graver Tank* the Court considered the doctrine of equivalents and reiterated its century-old holding that "the essence of the doctrine of equivalents is that one may not practice a fraud on the patent." 339 U.S. at 608. The Court reviewed the history of the doctrine [\*\*51] starting with *Winans v. Denmead*, 56 U.S. (15 How.) 330, 14 L. Ed. 717 (1853), as well as the function-way-result criteria established in *Union Paper Bag Machine Co. v. Murphy*, 97 U.S. 120, 125, 24 L. Ed. 935 (1877) and reiterated in *Sanitary Refrigerator Co. v. Winters*, 280 U.S. 30, 42, 74 L. Ed. 147, 50 S. Ct. 9 (1929) ("generally speaking, one device is an infringement of another 'if it performs substantially the same function in substantially the same way to obtain the same result'"). The *Graver Tank* Court observed that the doctrine of equivalents "has been consistently applied by this Court and the lower federal courts, and continues today ready and available for utilization when the proper circumstances for its application arise," 339 U.S. at 608, and expressed concern [\*\*1065] lest "the protection of the patent grant [be converted] into a hollow and useless thing." *Id.* at 607.

The Court held in *Graver Tank* that equivalency was available as to the accused manganese silicate welding flux, which was disclosed in the specification but not claimed, and had been found by the district court to be equivalent in fact. The [\*\*52] two dissenters took the position that because the manganese silicate flux was disclosed but not claimed it was dedicated to the public and not reachable under the doctrine of equivalents. Justice Black, joined by Justice Douglas, wrote in dissent that "the function of claims under R.S. § 4888, as we have frequently reiterated, is to exclude from the patent monopoly field all that is not specifically claimed,

whatever may appear in the specifications. See, e.g., *Marconi Wireless Co. v. United States*, 320 U.S. 1, 23, 87 L. Ed. 1731, 63 S. Ct. 1393, and cases there cited. Today the Court tacitly rejects those cases." *Graver Tank*, 339 U.S. at 614 (Black, J., dissenting). Justice Douglas wrote a separate dissent, stating that the disclosed but unclaimed subject matter was public property: "Manganese silicate, the flux which is held to infringe, is not an alkaline earth metal silicate. It was disclosed in the application and then excluded from the claims. It therefore became public property." *Id.* at 618 (Douglas, J., dissenting).

The *Graver Tank* Court, rejecting the dissenters' position, held that the question of equivalency [\*\*53] is to be decided "against the context of the patent, the prior art, and the particular circumstances of the case," 339 U.S. at 609, and stated that equivalency "in the patent law, is not the prisoner of a formula." *Id.* The Court sustained the availability of equivalency of the manganese silicate flux, over the dissenters' protestations that it was disclosed and not claimed and therefore public property.

The Court in *Warner-Jenkinson* reaffirmed *Graver Tank*, summarizing that "we considered the application of the doctrine of equivalents to an accused chemical composition for use in welding that differed from the patented welding material by the substitution of one chemical element." 520 U.S. at 24. The *Warner-Jenkinson* Court made clear that the *Graver Tank* Court had declined to adopt the arguments of the dissent. *Id.* at 26 and n.3. Perhaps recognizing that *Graver Tank* is a powerful obstacle to this court's new per se rule, my colleagues propose various gambits to distinguish *Graver Tank*. The per curiam opinion proposes that the inclusion of manganese silicate in invalid claims was critical to the decision [\*\*54] in *Graver Tank*, although neither the majority nor the dissenting opinions mentioned it. My colleagues thus take the curious position that the inclusion of disclosed subject matter in invalid claims renders that subject matter available for equivalency, but that otherwise the subject matter is barred from equivalency. That is not, of course, the holding of *Graver Tank*.

This court's new rule contravenes not only *Graver Tank* but also *Warner-Jenkinson*. The Court in *Warner-Jenkinson* was presented with the defendant's argument that access to the doctrine of equivalents should be limited to subject matter that is actually disclosed in the patent. The Court held that "rejecting the [argument that equivalency is limited to known equivalents] necessarily rejects the more severe proposition that equivalents must not only be known, but must also be actually disclosed in the patent in order for such equivalents to infringe upon the patent." 520 U.S. at 37. Thus the Court explicitly recognized that [\*\*1066] equivalents that are actually

285 F.3d 1046, \*; 2002 U.S. App. LEXIS 5171, \*\*;

62 U.S.P.Q.2D (BNA) 1225

disclosed in the patent can infringe under the doctrine of equivalents. The obligation of the lower courts is to adhere to the law as **[\*\*55]** it is announced by the Supreme Court, and in keeping with the Court's stated purposes. See, e.g., *Williams v. United States*, 240 F.3d 1019, 1030 (Fed. Cir. 2001) (holding that this court is "strictly bound" to adhere to Supreme Court precedent); *Payne v. Tennessee*, 501 U.S. 808, 828, 115 L. Ed. 2d 720, 111 S. Ct. 2597 (1991) ("Considerations in favor of *stare decisis* are at their acme in cases involving property and contract rights, where reliance interests are involved."); *Arizona v. Rumsey*, 467 U.S. 203, 212, 81 L. Ed. 2d 164, 104 S. Ct. 2305 (1984) ("any departure from the doctrine of *stare decisis* demands special justification").

The facts of the Johnston patent here in suit do not differ from those of Graver Tank in any discernible way. The nature of the disclosure of manganese silicate in the patent in Graver Tank is not distinguishable from the nature of the disclosure of stainless steel in the Johnston patent. In the patent in Graver Tank the manganese silicate was disclosed in the specification as follows:

We have used calcium silicate and silicates of sodium, barium, iron, manganese, cobalt, **[\*\*56]** magnesium, nickel and aluminum, both in binary and tertiary combinations, in various proportions. We have also used calcium titanate and various titano-silicates, these being used when it is desirable to introduce titanium into the weld metal. While a number of these conductive welding compositions are more or less efficacious in our process, we prefer to use silicates of the alkaline earth metals, such as calcium silicate, . . .

Linde Air Products Patent No. 2,043,960, col. 3, lines 62-73. The only claims before the Court were for the silicates of the alkaline earth metals. There was no claim for manganese silicate; manganese is not an alkaline earth metal. The Court held that infringement by manganese silicate could be reached under the doctrine of equivalents, subject to findings of the trier of fact as to equivalency.

In the Johnston patent the stainless steel substrate was disclosed in the specification as follows:

While aluminum is currently the preferred material for the substrate, other metals, such as stainless steel or nickel alloys may be used. In some instances, such as in laminating plastic credit cards, polypropylene can be used.

Johnston Patent **[\*\*57]** No. 5,153,050, col. 5, lines 5-9. The only claims before the court were for the aluminum metal substrate. There was no claim for the stainless steel substrate. The district court held that infringement by the stainless steel substrate could be reached under the doctrine of equivalents, subject to findings of the trier of fact as to equivalency.

Graver Tank states that equivalency "must be determined against the context of the patent, the prior art, and the particular circumstances of the case." 339 U.S. at 609. Binding precedent thus excludes a per se bar to equivalency simply because stainless steel was disclosed in the specification. Our obligation is to apply the Court's precedent, and to do so with fidelity to the Court's meaning. *Hutto v. Davis*, 454 U.S. 370, 375, 70 L. Ed. 2d 556, 102 S. Ct. 703 (1982) (per curiam) ("But unless we wish anarchy to prevail within the federal judicial system, a precedent of this Court must be followed by the lower federal courts no matter how misguided the judges of those courts may think it to be."). This court's adoption of the position of the dissents in Graver Tank is, simply, improper. **[\*1067]**

The court **[\*\*58]** states that "the patentee's subjective intent is irrelevant in determining whether unclaimed subject matter has been disclosed and therefore dedicated to the public." Per curiam op. n.l. I agree that subjective intent is not relevant to what is actually disclosed. However, objective evidence of intent to dedicate is relevant to the question of dedication. It is not disputed that Johnston filed two continuing applications with claims to the stainless steel substrate. Johnston's U.S. Patent No. 5,725,937 claims the stainless steel explicitly; n1 for example:

1. A component for use in manufacturing articles such as printed circuit boards comprising:

a laminate constructed of a sheet of copper foil which, in a finished printed board, constitutes a functional element and a sheet of stainless steel which constitutes a discardable element; . . .

This alone defeats an absolute bar that is based on a theory of dedication, for precedent holds that claiming of subject matter in a continuing application rebuts any inference that the disclosed but unclaimed subject matter was abandoned. *In re Gibbs*, 58 C.C.P.A. 901, 437 F.2d 486, 494, 168 U.S.P.Q. (BNA) 578, 582 (CCPA 1971). **[\*\*59]** This aspect of the court's decision appears to raise a further conflict with precedent.

n1 Johnston's patents in which stainless steel is claimed had not issued during the pendency of most of this litigation.

285 F.3d 1046, \*; 2002 U.S. App. LEXIS 5171, \*\*;

62 U.S.P.Q.2D (BNA) 1225

### ***Federal Circuit Cases Contrary to Today's Decision***

In addition to denying the precedent of the Supreme Court, this court *en banc* impeaches several of its own prior decisions, for equivalency has routinely been deemed applicable to disclosed but unclaimed subject matter. To reach this policy-driven result the court juxtaposes two extreme factual situations of disclosed but unclaimed subject matter, exemplified by *Maxwell v. J. Baker, Inc.*, 86 F.3d 1098, 39 U.S.P.Q.2D (BNA) 1001 (Fed. Cir. 1996) and *YBM Magnex Inc. v. International Trade Commission*, 145 F.3d 1317, 46 U.S.P.Q.2D (BNA) 1843 (Fed. Cir. 1998), and holds that the facts are irrelevant and equivalency is never available. Thus the court holds that despite the extreme diversity of factual situations that arise in technical [\*\*60] disclosures and in claiming practices, access to equivalency will always be barred for disclosed subject matter. Such a heavy-handed approach removes from the courts and parties the opportunity and right to review of the merits of individual cases in dispute.

Per se legal rules are appropriate only when the policy is so clear and the outcome so inevitable that a blanket rule is a reasonable shortcut. See *Continental T.V. Inc. v. GTE Sylvania Inc.*, 433 U.S. 36, 50, 53 L. Ed. 2d 568, 97 S. Ct. 2549 (1977) (per se rules require "broad generalizations" and reflect the judgment that while some situations may fall outside the generalization they "are not sufficiently common or important to justify the time and expense necessary to identify them"). Today's per se rule is not of that class. It simply avoids the court's obligation to reach considered decisions on the merits, by holding that equivalency is unavailable whatever the facts. See *Albertson's, Inc. v. Kirkingburg*, 527 U.S. 555, 566, 144 L. Ed. 2d 518, 119 S. Ct. 2162 (1999) (stating that "these variables are not the stuff of a per se rule" in declining to classify disease as a [\*\*61] per se disability due to the potential for differing fact scenarios). Similarly, the diversity of technological situations in patents requires a more sensitive legal framework than the bludgeon of a per se rule. [\*1068]

Absent a per se rule, the facts of *Maxwell v. Baker* and *YBM Magnex* could indeed be resolved to reach divergent results under the existing law. In *Maxwell v. Baker* the patentee had fully described and enabled two distinct methods of attaching a pair of shoes. Only one method was claimed; the accused infringer used the other. This court held that equivalency was not available to reach the unclaimed method, reasoning that a patentee can not choose to claim only one of two distinct and fully disclosed inventions, thereby avoiding examination of the other, and then later grasp the unclaimed invention as an equivalent of the first. The court held that the patentee had dedicated the unclaimed method to the public, and

could not resort to the doctrine of equivalents. On the facts of that case, this was a reasonable decision.

In contrast, in *YBM Magnex* the unclaimed magnet compositions differed from those that were claimed solely by the amount of one of [\*\*62] the components of the composition. The specification described iron-neodymium-boron magnetic alloys containing oxygen, illustrated the effect of oxygen on magnet stability, and claimed the alloys with the optimum oxygen range. The accused magnets were made of the same alloys but the amount of oxygen was below the optimum range. The amount of oxygen was the only difference between the claimed and the accused magnets. The court held that access to the doctrine of equivalents was not barred, distinguishing *Maxwell v. Baker* as directed to a different kind of factual situation, and explaining that Supreme Court precedent "does not permit the blanket rule that everything disclosed but not claimed is barred from access to the doctrine of equivalents, whatever the facts, circumstances, and evidence." *YBM Magnex*, 145 F.3d at 1320, 46 U.S.P.Q.2D (BNA) at 1846. The *en banc* court today replaces this holding with a per se bar to equivalency, eliminating the opportunity for consideration of the facts, circumstances, and evidence. n2

n2 The court stresses that an advantage of its new rule is that the courts need not consider the equivalency of "more than that properly examined by the PTO." Per curiam op. at 13. The idea that the patentee can choose to avoid examination by refraining from claiming disclosed equivalent subject matter is contrary to the rules of patent examination. MPEP '904.01(b) states:

All subject matter that is the patentable equivalent of the subject matter as defined in the claim even though specifically different from the definition in the claim, must be considered.

Disclosing without claiming simply enlarges the field of the examiner's search and citation of prior art, enlarging the prosecution history. It thus serves to generate estoppels, not to provide an opportunity to avoid examination.

[\*\*63]

Application to the facts of *YBM Magnex* illustrates the court's new rule. The claimed and unclaimed subject matter appear in the following Figure from the patent in suit. The Figure is a graph showing the effect of variation in the oxygen content on the stability of the iron-

285 F.3d 1046, \*; 2002 U.S. App. LEXIS 5171, \*\*;

62 U.S.P.Q.2D (BNA) 1225

neodymium-boron magnets: [\*1069]

[SEE GRAPH IN ORIGINAL]

The patentee claimed the range of oxygen content represented in the segment of the graph designated "Excellent Resistance" at the top of the curve; the claims are for an oxygen content of 0.6 to 3.5 weight percent (claimed as 6,000 to 35,000 ppm). The accused iron-neodymium-boron magnets contained the claimed proportions of the same metallic elements, but they had oxygen contents ranging from 0.545 to 0.6 weight percent. The oxygen content of the accused magnets was within or very close to the "excellent resistance" part of the curve, although those below 0.6 weight percent were outside of the literal scope of the claims. Today's per se rule would preclude the assertion of equivalency against the magnets with an oxygen content below 0.6 weight percent, solely because such content was disclosed in the specification. Issues of estoppel, prior art, dedication, [\*64] or abandonment, have become irrelevant; disclosure alone is an absolute bar to access to the doctrine of equivalents.

Patentees often must draw lines in order to claim their invention with specificity. See 35 U.S.C. § 112 (the claims must "particularly point[] out and distinctly claim[] the subject matter which the applicant regards as his invention.") The establishment of a per se rule so heavily weighted against disclosure is not only inappropriately simplistic, but is contrary to the policy of the patent law. It may be that the data for magnetic alloy oxygen contents outside of the optimum range is only of scientific interest. I do not know its scientific value to students of magnetism, but I can think of no value whatsoever of designing a patent law that fosters its withholding.

There is extensive Federal Circuit precedent where the accused infringing device [\*1070] or composition was within the disclosure. See, e.g., *Uniroyal, Inc. v. Rudkin-Wiley Corp.*, 939 F.2d 1540, 1544, 19 U.S.P.Q.2D (BNA) 1432, 1436 (Fed. Cir. 1991) ("the patent specification teaches that a device otherwise satisfying the claim limitations works in the same manner, [\*65] but not as efficiently, if it is of a different height or positioned differently"); *Miles Labs., Inc. v. Shandon Inc.*, 997 F.2d 870, 877, 27 U.S.P.Q.2D (BNA) 1123, 1128 (Fed. Cir. 1993) (use of a separate cabinet was disclosed although the claims were limited to a single cabinet; equivalency was available); *Pall Corporation v. Micron Separations, Inc.*, 66 F.3d 1211, 1220, 36 U.S.P.Q.2D (BNA) 1225, 1231 (Fed. Cir. 1995) (the asserted equivalent polyamide resin was disclosed but not claimed); *Modine Mfg. Co. v. International Trade Commission*, 75 F.3d 1545, 37 U.S.P.Q.2D (BNA) 1609, 1615-16 (Fed. Cir. 1996) (the asserted equivalent range was disclosed in the specification but not literally

included in the claim). Heretofore, the breadth of the technical content in the specification did not entail legal consequences that would be unknowable until after examination and definition of the claimed invention.

In ostensible support of its position the per curiam opinion offers several citations to authority. However, most of the cases cited do not concern the doctrine of equivalents, but simply state that the claims establish the scope of the patented invention. That [\*66] has always been the law, a law that has coexisted with the doctrine of equivalents. E.g., *McClain v. Ortmyer*, 141 U.S. 419, 35 L. Ed. 800, 12 S. Ct. 76 (1891) (no issue of equivalency; at issue were literal infringement and novelty); *Milcor Steel Co. v. George A. Fuller Co.*, 316 U.S. 143, 86 L. Ed. 1332, 62 S. Ct. 969 (1942) (no issue of equivalency; invalidity due to improper addition of new claim elements); *Aro Mfg. Co. v. Convertible Top Replacement Co.*, 365 U.S. 336, 5 L. Ed. 2d 592, 81 S. Ct. 599 (1961) (no issue of equivalency; question of contributory infringement); *Atlantic Thermoplastics Co. v. Faytex Corp.*, 974 F.2d 1299, 24 U.S.P.Q.2D (BNA) 1138 (Fed. Cir. 1992) (no issue of equivalency).

Of the two cited cases that do relate to the doctrine of equivalents, neither case supports a disclosed-but-not-claimed theory. In *Continental Paper Bag Co. v. E. Paper Bag Co.*, 210 U.S. 405, 415, 52 L. Ed. 1122, 28 S. Ct. 748 (1908) the Court affirmed infringement under the doctrine of equivalents, stating that "the range of equivalents depends upon and varies with the degree of invention." In *SRI Int'l v. Matsushita Elec. Corp.*, 775 F.2d 1107, 1123, 227 U.S.P.Q. (BNA) 577, 587 (Fed. Cir. 1985) [\*67] this court stated that "the law acknowledges that one may appropriate another's patented contribution not only with a product precisely described in a patent claim (literal infringement) but also with a product that is not quite so described . . . (doctrine of equivalents)." These cases provide no support for the per se rule now adopted.

The per curiam opinion's only citations relating to disclosed but unclaimed subject matter, *Miller v. Bridgeport Brass Co.*, 104 U.S. 350, 26 L. Ed. 783 (1881) and *Mahn v. Harwood*, 112 U.S. 354, 28 L. Ed. 665, 5 S. Ct. 174 (1884), concern reissue patent entitlement, not equivalency. Both cases relate to the availability of a broadening reissue after a prolonged period, sixteen years in Miller, four years in Mahn. In both cases the Court invoked laches, not dedication, to invalidate the reissue. Rulings on reissue laches are not authority for this court's adoption of the Graver Tank dissent.

The new challenges and new burdens of today's ruling are as unnecessary as they are ill-conceived. I take note that a colleague writes separately to propose that [\*1071] today's *en banc* rule is no more than resolution [\*68] of a perceived conflict between two Federal

285 F.3d 1046, \*; 2002 U.S. App. LEXIS 5171, \*\*;

62 U.S.P.Q.2D (BNA) 1225

Circuit opinions and the court's preference for the earlier (Maxwell) over the later (YBM Magnex). However, no pre-Maxwell case adopted a *per se* rule barring equivalency for all unclaimed disclosures, and Maxwell itself violated our rule of precedence. However, my concern is not with whether this court has authority to resolve perceived conflict among our own cases, for of course we can do so. My concern is that if this case is indeed viewed by my colleagues as no more than a quibble between two recent holdings, it shows the court's lack of comprehension of the significance of its action.

n3

n3 The *amicus curiae* briefs filed on behalf of the American Intellectual Property Law Association and American Bar Association state in strong terms their concern that inventors will restrict the technical content of patent specifications. Of course, avoiding the pitfalls of today's *per se* rule will not be easy in view of the vicissitudes of patent examination -- further illustrating the burden of this change in the law.

By resolution of the House of Delegates, the American Bar Association adopted the Section's position that "a *per se* rule in this situation would be ill advised and would unnecessarily eliminate a scope of protection to which many patentees should be entitled. The preclusion of the doctrine of equivalents should be limited to those situations in which the patentee's failure to claim disclosed subject matter would indicate to the public that such subject matter was disclaimed or dedicated to the public."

[\*\*69]

The public interest in fostering innovation and technological advance is not served by a judicial decision that imposes legal obstacles to the disclosure of scientific and technologic information. Information dissemination is a critical purpose of the patent system. By penalizing the inclusion of information in the specification the patent becomes less useful as a source of knowledge, and more a guarded legal contract.

No patentee deliberately chooses the doctrine of equivalents to protect commercial investment. Yet every patentee must guard against infringement at the edges of the invention. After today, whenever a patentee draws a line in a disclosed continuum, the copier who simply crosses the line can avoid even the charge of equivalency; a safe and cheap way to garner the successes of another. Each new pitfall for inventors simply diminishes the value of the patent incentive, and ultimately inhibits technological innovation. Concern for the effectiveness of the patent system has always been a

factor in innovation activity. A study by Wesley M. Cohen *et al.*, *Protecting Their Intellectual Assets: Appropriability Conditions and Why U.S. Manufacturing Firms Patent (Or Not)*, [\*\*70] Nat'l Bureau of Econ. Research Working Paper 7552, at 14 (2000), reported that in a 1994 survey of R&D managers 65% of the respondents cited the ease of avoiding patent claims as the main deterrent to patent-based investment in technology, and 47% also cited concern for disclosing technical information without adequate protection.

Discovery of and commercialization of new things is notoriously risk-laden, yet it is the inventor and the innovator, those whose ingenuity and ambition create new things while taking the risk of loss, who provide the basis of industrial advance and economic growth. See, e.g., Edwin Mansfield, *Intellectual Property Protection, Foreign Direct Investment, and Technology Transfer*, International Finance Corp., Discussion Paper No. 19 (The World Bank, 1997) at 1 (80% of industry members surveyed considered patent strength a major consideration in allocating global research and development dollars); Office of Technology Assessment, U.S. Congress, *Innovation [\*\*1072] and Commercialization of Emerging Technology*, 20-96 (1995) (discussing costs borne by the innovator).

The role of patent systems in the allocation of commercial resources is of ever-increasing [\*\*71] economic importance, as technology dominates the economy. See, e.g., Kenneth W. Dam, *The Economic Underpinnings of Patent Law*, 23 *J. Legal Studies* 247 (1994) (analyzing how creation of property rights in technology encourages investment in innovation); Symposium on Patents and Technology Licensing, 21 *Rand J. Econ.* 103 (1990) (investigating link between patent law, innovation, and economic development); see generally F. Scott Kieff, *Property Rights and Property Rules for Commercializing Inventions*, 85 *Minn. L. Rev.* 697, 699 (2001) (discussing relationships between patent systems and economic growth; collecting authorities).

A judicial change in the balance between innovator and imitator should not be made in disregard of the consequences. The neatness of a *per se* rule is not necessarily sound legal or economic policy. Nor is it sound judicial policy, for in addition to issues of commerce and technology-based industry, this case raises questions of fundamental fairness as to disputes that will now be excluded from judicial review. Fairness is the foundation of due process; it is superior to, not subordinate to, *per se* rules. [\*\*72]

#### *Decision of this Case*

This appeal can be decided on the present law. It is unnecessary to create a new, absolute, and unchallengeable dedication of everything in the specification that is not included in the claims.

285 F.3d 1046, \*; 2002 U.S. App. LEXIS 5171, \*\*;

62 U.S.P.Q.2D (BNA) 1225

The Johnston specification states that the substrate serves as a disposable carrier for the copper foil, that aluminum is preferred, and that steel can be used. The specification also states that the nature of the substrate is not material to the invention. The factual question of equivalency was tried to a jury. On appellate review in

accordance with the rules for review of jury verdicts, there was substantial evidence in support of the jury verdict. That is all that was appropriate to decision of this appeal.