United States District Court,
D. Massachusetts.

CONTROL RESOURCES, INC,
Plaintiff.
v.
DELTA ELECTRONICS, INC. and LSI Logic Storage Systems, Inc,
Defendants.

CIV.A. No. 99-11892-WGY

March 30, 2001.

Owner of patents covering computer fan controls sued competitor, alleging infringement. Alleged infringer moved for summary judgment of noninfringement. The District Court, Young, Chief Judge, held that: (1) material issues of fact, as to whether accused control literally infringed limitations of patent governing speed setting and temperature comparison, precluded determination of literal infringement of first patent; (2) there was no literal infringement of second patent, due to accused control's lack of provision for difference in temperature rise of semiconductor junction substantially equal to change in exhaust air temperature; (3) prosecution history estoppel barred claim that first patent was infringed, under doctrine of equivalents; and (4) prosecution history estoppel barred claim that second patent was infringed, under doctrine of equivalents.

Partial summary judgment for alleged infringer.

4,722,669. Not Infringed.

Peter J. Manus, George W. Neuner, David A. Tucker, Edwards & Angell, LLP, Boston, MA, for plaintiffs.

Alan D. Smith, Fish & Richardson, Boston, MA, for defendants.

MEMORANDUM AND ORDER

YOUNG**, Chief Judge.**

The Federal Circuit is different. Unlike the other circuit courts of appeal, the Federal Circuit came into being, in part, pursuant to an express Congressional mandate to foster uniformity in the application of the law of patents. *See* S.Rep. No. 97-275, at 5-6 (1981), *reprinted in* 1982 U.S.C.C.A.N. 11, 15-16. The Supreme Court refers to the Federal Circuit as "a specialized court," Dickinson v. Zurko, 527 U.S. 150, 163, 119 S.Ct. 1816, 144 L.Ed.2d 143 (1999), and pays heed to its "sound judgment" on patent law, Warner-Jenkinson Co. v. Hilton Davis Chem. Co., 520 U.S. 17, 40, 117 S.Ct. 1040, 137 L.Ed.2d 146 (1997). Indeed, the Federal Circuit views itself as a substantive policymaker, a court with a mission:

Congress specifically created the Federal Circuit to resolve issues unique to patent law such as those regarding prosecution history estoppel, which is a judicially created doctrine. Congress contemplated that the Federal Circuit would "strengthen the United States patent system in such a way as to foster technological growth and industrial innovation." Issues such as the one before us in this case are properly reserved for this court to answer with "its special expertise."

Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 234 F.3d 558, 571-72 (Fed.Cir.2000) (en banc) (citations omitted). FN1 Yet:

FN1. Federal Circuit Judge Pauline Newman is perhaps the strongest critic of her court's policy initiatives: In acting to severely limit the doctrine of equivalents, this court has made a deliberate change in the relationship between innovator and competitor. Although the Supreme Court rejected judicial entry into this policy arena, the majority has entered headlong, criticizing 150 years of Supreme Court precedent and 18 years of Federal Circuit precedent as "unworkable." This spontaneous judicial action represents a venture into industrial policy whose consequences have been inadequately considered. The majority's announced purpose of facilitating competition by restricting patentees' access to the doctrine of equivalents has not been evaluated for its effect on the nation's technology-based industry, for its effect on the system of patents as an innovation incentive, or indeed for its effect on competition. The interdependent policy aspects of technologic innovation, industrial growth, and competition were not briefed, and do not inhere in this court's "special expertise" in adjudication of patent disputes.

Festo, 234 F.3d at 630 (Newman, J., concurring in part and dissenting in part). "I caution against ... policy-driven activism whereby the application of the law will not be known until the Federal Circuit hears the case.... It is policy choices that lead to departure from precedent, into the judicial activism that weighs against legal stability.... [P]olicy choices are not the province of judges." Pauline Newman, *The* Federal Circuit: Judicial Stability or Judicial Activism?, 42 Am. U.L.Rev. 683, 688 (1993).
Almost since its inception, the Federal Circuit has been dogged with criticism for straying from the path carefully delineated for appellate tribunals. FN2 Disappointedlitigants and commentators alike have criticized the court for fact-finding and other forms of hyperactive judging. FN3 Increasingly, the bar is expressing concern over the court's decision-making procedures and its apparent willingness to take over the roles of patent examiner, advocate and trier of fact.FN4
FN2. *See, e.g.,* Douglas A. Strawbridge[, Daniel W. McDonald & R. Carl Moy], A Review of Recent Decisions of the United States Court of Appeals for the Federal Circuit: Area Summary: Patent Law Developments in the United States Court of Appeals for the Federal Circuit 1986, 36 Am. U.L.Rev. 861, 875 (1987); [Maureen McGirr, Note, Panduit Corp. v. Dennison Mfg. Co.: De Novo Review and the Federal Circuit's Application of the Clearly Erroneous Standard, 36 Am. U.L.Rev. 963, 967, 980-81 (1987)]; Edward V. Filardi & Robert C. Scheinfeld, *Appellate Review of Patent Bench Trials: Is the CAFC Following Rule 52(a)?, in Current Developments in Patent Law 1985,* at 9, 14 & n. 3 (PLI Patents, Copyrights, Trademarks, and Literary Property Course Handbook Series No. 213, 1985)....

FN3. *See, e.g.,* Strawbridge[, McDonald & Moy], *supra* note [2], at 875 ("The Federal Circuit has had considerable difficulty adjusting to its role as a court of appeals under Rule 52(a).").

FN4. The evidence for this assertion is largely anecdotal. Practitioners, being mindful of the fact that, in any

given case, judicial hyperactivity will likely benefit one side or the other, are understandably reticent to voice strong criticisms of the court. Commentators have noted, however, the general tendency on the part of the Federal Circuit to take for itself the role of final arbiter of issues that, at least at one time, were fairly considered the province of the trial court and jury. For example, Ted D. Lee and Michelle Evans observe that, in applying the substantial evidence standard:
when the Federal Circuit believes the jury verdict was correct, it simply holds that the substantial evidence test was met. On the other hand, when the Federal Circuit believes the jury verdict was wrong, it substitutes its opinion for that of the jury and simply states that the substantial evidence test was not met.

Ted D. Lee & Michelle Evans, *The* Charade: Trying a Patent Case to All "Three" Juries, 8 Tex. Intell. Prop. L.J. 1, 14 (1999).
William C. Rooklidge & Matthew F. Weil, Judicial Hyperactivity: The Federal Circuit's Discomfort with its Appellate Role, 15 Berkeley Tech. L.J. 725, 729-30 (2000) (citations in original).

The apparent tension results from a fundamental difference in orientation between the Federal Circuit ("the sole court of appeals for patent matters," Festo, 234 F.3d at 574-75) and the ninety-four district courts that it supervises. The Federal Circuit is akin to the civil code courts of the European community, a point noted in MediaCom Corp. v. Rates Tech., Inc., 4 F.Supp.2d 17, 30 n. 11 (D.Mass.1998). Its emphasis is on the careful delineation of ever more explicit and detailed rules, a "patent code," if you will. Although it recognizes that quasi-statutory rulemaking necessarily runs the risk of over- and under-inclusion, it sees as paramount "the need for certainty as to the scope of patent protection." Festo, 234 F.3d at 575. Such "certainty aids both the public and the patentee in ascertaining the true scope and value of the patent without having to resort to litigation to obtain a case by case analysis.... [With bright-line rules], neither the public nor the patentee is required to pay the transaction costs of litigation...." Id. at 577.

In contrast, "litigation" and "case by case analysis" is the very *raison d'etre* of the district courts. Courts of statutory jurisdiction, which embody America's rich common law tradition, daily bring to expressive life for juries of common sense America's broadest philosophic legal concepts-concepts such as "reasonable doubt," "proximate cause," "scienter," and "negligence." Although this hands-on judicial law teaching is central to the proper working of our jury system under the Seventh Amendment, *see* 19 William G. Young, John R. Pollets & Christopher Poreda, Massachusetts Practice s. 102.1, at 13-17 (2d ed.1998), it is only peripheral to the exposition and application of the patent law today, *see, e.g.,* Festo, 234 F.3d at 591-95 (Plager, J., concurring) (arguing that although the doctrine of equivalents ought be preserved, juries ought be excluded from its application). Small wonder, then, that intellectual tension exists as the court of the future struggles to impose its vision and to shape the views of those courts that rightly consider themselves the prime guardians of the most vital expression of direct democracy in America today-the jury of the people.

The instant case plays itself out against this backdrop, in a way that the patentee never intended and could not possibly have foreseen, but which, post- *Festo,* the Federal Circuit views as a largely forgone conclusion.

I. FACTUAL AND LEGAL BACKGROUND

The plaintiff, Control Resources, Inc. ("Control"), brought this patent infringement action against the defendants, Delta Electronics, Inc. and LSI Logic Storage Systems, Inc. (collectively "Delta"), alleging that Delta's variable speed fans infringe its patents, U.S. Patent No. 4,659,290 (issued April 21, 1987) (the " '290

patent") and U.S. Patent No. 4,722,669 (issued February 2, 1988) (the " '669 patent"), which is a continuation-in-part of the '290 patent. After a limited discovery phase focused only on the question of infringement, Delta moved for summary judgment.

A. The Parties

Control is a small Littleton, Massachusetts company that manufacturers a line of speed controllers sold to computer manufacturers. A speed controller, as described in both the '290 patent and the '669 patent, is a device that controls fan speed in response to temperature. Warren Kundert ("Kundert") is the inventor of both patents and the current chairman of Control.

Delta Electronics, Inc. also manufactures fans that change speed as a function of temperature. To control the speed of the fan, Delta uses an integrated circuit chip purchased from Toshiba.

LSI Logic Storage Systems, Inc. manufactures and sells data storage units. Each unit includes ten disk drives, two power supplies, various supporting electronics, and four Delta variable fans. The Delta fans are used to cool the components of the data storage unit. Each fan uses the Toshiba chip to vary fan speed.

B. The Patents

Both the '290 patent and the '669 patent describe an apparatus that controls fan speed to regulate air temperature in heat-generating electronic devices such as computers. Both patents seek to provide effective cooling to improve the quality and reliability of electronic equipment with minimal acoustical noise. To do so, a signal from a temperature sensor is fed to a circuit. In response to the signal, the circuit automatically adjusts the fan speed and thus regulates the internal temperature.

The '290 patent claims:

1. A fan speed controller suitable for controlling a motor-driven fan for cooling heat dissipating electronic equipment, said controller comprising:

electronic power control means responsive to an input signal level for varying the energization of the fan motor;

means for generating a *fixed level control signal* corresponding to *half maximum fan speed;*

means, including an air temperature sensing element responsive to the temperature of exhaust air leaving the equipment, for generating a variable level control signal corresponding to the temperature of the exhaust air propelled by said fan; *OR circuit means* operative to generate an output signal substantially equal to the greatest of any input signal applied thereto, said fixed and variable control signals being applied to said OR circuit as inputs with said OR circuit means output signal being applied to said power control means as the input signal level, whereby, above half maximum, fan speed is controlled in a closed loop as a function of air temperaturein a sensed tending to hold exhaust air temperature constant.

'290 patent, col.6, 11.11-33 (emphasis added). Essentially, there are two signals, a "fixed level control signal corresponding to half maximum fan speed" and a "variable level control signal corresponding to the temperature of the exhaust air." The signals are transmitted to an OR circuit. The OR circuit generates an output signal that is substantially equal to the greater of the two input signals. If the fixed level control

signal is greater, then the fan runs at roughly half maximum speed. If the variable level control signal is the greater of the two, then the fan speed increases in relation to the temperature of the exhaust air. This system holds the exhaust air at a constant temperature.

The relevant portion of the '669 patent claims:

1. Apparatus for air cooling electronic equipment comprising a plurality of heat-generating elements whose thermal resistance varies with air velocity, said equipment having a nominal power dissipation, said apparatus comprising:

a fan for driving an air flow through the equipment;

means for sensing exhaust air temperature of the air flow passing through the equipment;

means for variably energizing said fan to provide rates of air flow spanning a predetermined range; and

circuit means responsive to said sensing means for controlling said energizing means in a feedback system to provide a variable air flow responsive to the temperature of said sensing means, the gain being such that, over said range of air flow rates and at said nominal power dissipation, the change in exhaust temperature produced by changing inlet air temperature is *substantially equal* to the change in temperature rise of a typical one of said heat-generating elements over said range of air flow rates.

'669 patent, col.6, 11.11-33 (emphasis added). In short, the patent relies on known thermal characteristics to tailor the response of a variable speed fan. The thermal resistance FN5 of a device will change with air flow velocity. As the air velocity increases, the temperature rise FN6 will change. The change in the temperature rise will be substantially equal to the difference in the exhaust temperature. Thus, if the difference in temperature rise is three degrees, then the difference in exhaust air temperature will be nearly three degrees as well. The '669 patent seeks to maintain the heat-generating devices, rather than the exhaust air, at a substantially constant temperature.

FN5. Thermal resistance is defined in the patent as "the ratio of temperature rise to power dissipation."'669 patent, col.4, 11.46-47.

FN6. Temperature rise is defined in the patent as "the difference in temperature from the surrounding air to the semiconductor junction. "'669 patent, col.4, 11.47-49.

C. " *Markman* is like sex. Timing is everything." FN7

FN7. Chief Judge Marilyn Hall Patel, Northern District of California, Address at the Legal and Regulatory Forum for Patenting Genomics and Proteomics at the Next Frontier (Feb. 26, 2001). The Northern District of California, together with the Districts of Delaware, Minnesota, and Massachusetts, has the highest ratio of patent to civil cases in the country. *See* Kimberly A. Moore, *Forum Shopping in Patent Cases: Does Geographic Choice Affect Innovation?,* 79 N.C. L.Rev. (forthcoming May 2001).

As is the practice of this Court, a *Markman* hearing was conducted prior to and entirely independently of the summary judgment hearing. Amgen, Inc. v. Hoechst Marion Roussel, Inc., 126 F.Supp.2d 69, 80-81 (D.Mass.2001); MacNeill Eng'g Co. v. Trisport, Ltd., 126 F.Supp.2d 51, 54 & n. 1 (D.Mass.2001); MediaCom Corp. v. Rates Tech., Inc., 4 F.Supp.2d 17, 21-22 (D.Mass.1998). Construing the claims without regard to the alleged infringement issues avoids conflating "the legal explication required by *Markman* " with the fact-finding role reserved for the jury. Amgen, 126 F.Supp.2d at 80. During the *Markman* hearing, the Court entertained oral argument with respect to the disputed claim limitations. Counsel referred the Court to the specific claim language, relevant portions of the written description, and the prosecution history. Although demonstrative aids were employed, extrinsic evidence was neither offered nor admitted.

Not surprisingly, each party urged a construction that supported its position on summary judgment. Delta sought a narrow construction that would distinguish its fans from the claim limitations. In contrast, Control encouraged a broader construction that would sweep the Delta fans within the province of both the '290 and the '669 patent.

Ultimately, however, the language of the claim itself defines the scope of the right to exclude. SciMed Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc., 242 F.3d 1337, 2001 WL 246373, at (Fed.Cir.2001); Renishaw PLC v. Marposs Societa' per Azioni, 158 F.3d 1243, 1248 (Fed.Cir.1998); Abtox, Inc. v. Exitron Corp., 122 F.3d 1019, 1023 (Fed.Cir.), *amended by* 131 F.3d 1009 (Fed.Cir.1997); Bell Communications Research, Inc. v. Vitalink Communications Corp., 55 F.3d 615, 619 (Fed.Cir.1995). But claims must be read in light of the written description, to determine whether the inventor has used any terms in a manner inconsistent with their ordinary meaning. Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1582 (Fed.Cir.1996). Absent a special definition in the written description, either explicit or implicit, SciMed, 242 F.3d 1337, 2001 WL 246373, at *7, the Court must adopt the plain and ordinary meaning given by persons having ordinary skill in the field of the invention, Renishaw, 158 F.3d at 1249.

[1] Although claim construction is matter of law, and thus lies within the sole province of a judge, this Court is cognizant of the eventual involvement of a jury. In the end, claim construction must result in a phraseology that can be taught to a jury of lay people. It is not enough simply to construe the claims so that one skilled in the art will have a definitive meaning. The claims must be translated into plain English so that a jury will understand. Thus, accurate words that convey the essence of the invention are needed. To minimize the risk of imprecision of language leading to misconceptions, it is appropriate to recite for the parties the claim construction as near as possible to the language intended for the jury and to give the parties an opportunity to comment. MacNeill, 126 F.Supp.2d at 56. This protocol was followed here.

With these canons of construction in mind, the Court interpreted four claim limitations identified by the parties as central to the dispute, three from the '290 patent and one from the '669 patent.

1. '290 Patent

a. "Fixed Level Control Signal"

[2] The limitation "fixed level control signal" is found in Claim 1 of the '290 patent. '290 patent, col.6, 1.17. With little discussion, the parties agreed that "fixed" means "constant." *Markman* Hr'g Tr. at 8:20 to 9:16. In addition, there was no real dispute that "signal" refers to an electrical characteristic that carries information. Delta then argued that "level" pertains to a specific amplitude, such as four volts. Id. at 9:22-24. The Court was unwilling, however, to read the word "amplitude" into the claim and declined to adopt Delta's proffered definition. Id. at 10:9-11. Instead, the Court construed "fixed level" as a complete phrase meaning "a

constant level which means does not vary according to external temperature." Id. Delta urged the Court to "simplify" the definition by eliminating "does not vary according to external temperature." Id. at 10:14-20. Delta offered no basis for its "simplification" from the intrinsic record and the Court was unpersuaded. Indeed, reading "level" in light of the written description, the Court explained, "the reason you have a fixed level control signal [in this patent] is so that it will not vary in accordance with external temperature." Id. at 10:24-25. Ultimately, the Court presented the following definition: "[F]ixed level control signal [means] a constant level, that is, one which does not vary according to external temperature; and a signal simply means an electrical characteristic that carries information." Id. at 11:10-14.

b. "Half Maximum Fan Speed"

[3] The limitation "half maximum fan speed" is found in Claim 1 of the '290 patent. '290 patent, col.6, 1.18. Relying on the ordinary meaning of the words, Delta contended that "half maximum" refers to fifty percent of the highest speed of the fan. Defs.' Mem. at 15. Control countered that one skilled in the art would not so limit the phrase and directed the Court to the written description for a more functional definition. Pl.'s Mem. at 7.

It is well-established that a patentee is free to use terms in a manner inconsistent with their ordinary meaning as long as the special definition is apparent from the specification or prosecution history. Vitronics, 90 F.3d at 1582-83; Hoechst Celanese Corp. v. BP Chems. Ltd., 78 F.3d 1575, 1578 (Fed.Cir.1996). During the *Markman* hearing, counsel for Control argued that "it would be clear to those skilled in the art reading the patent that this is not a precise value ... a half maximum is not a number, it is not a speed, it is a range of speeds." *Markman* Hr'g Tr. at 13:8-13. Control directed the Court to column 4, line 33 of the '290 patent to support its argument that "the thrust of the entire specification supporting that claim and the half max is that the minimum represents ... a value which is not on some arbitrary scale from the fan stopping to the fan going full blast, but is at a point that meets those balancing functions." Id. at 15:22 to 16:2. The "balancing functions" refers to the invention's goal of providing optimum cooling with low acoustical noise.

The patent teaches that "it is highly desirable to maintain a predetermined fan speed, e.g. approximately half maximum speed, when air temperature is below the preselected threshold." '290 patent, col.4, 11.33-36. The preselected threshold refers to the temperature above which the fan speed increases. The summary of the invention states that the predetermined fan speed is the minimum speed needed to provide "adequate cooling of the electronic equipment under typical or nominal conditions." Id. col.2, 11.1-3. Thus, according to Control, "half maximum" does not refer to a number, but rather identifies the minimum speed necessary to achieve adequate cooling under normal conditions. *Markman* Hr'g Tr. at 15:12-18; Pl.'s Mem. at 8 (asserting that half maximum must be defined functionally to reflect a balance between acoustical noise and cooling).

Control's construction, however, provides no limit to the "half maximum fan speed" limitation. If "half maximum" were defined as the minimum speed necessary to achieve adequate cooling, then "fan speed" could vary widely depending on the environment, the electrical components, and any number of other factors not incorporated into the patent. Such a broad construction is not only contrary to the plain meaning of the limitation but also contradicts the prosecution history. During prosecution of the patent, Control was forced to amend its original limitation of "preselected minimum" to avoid prior art. Katz Decl. Ex. B at C00059. "To further aid in distinguishing from [the prior art], each of the independent claims has been amended to recite that the fixed level corresponds to 'one-half maximum fan speed'...." Id. at C00047. Control cannot now reclaim what it willingly abandoned to obtain the patent.

During claim construction, the Court acknowledged that "half maximum" is not a precise figure. Specifically, the Court accepted Control's argument that the highest rated speed of a fan varies. In addition, the Court recognized that the written description teaches "approximately," not exactly, half maximum. '290 patent, col.4, 1.34. Ultimately, the Court ruled that "half maximum speed means roughly fifty percent of the highest rated speed of the fan having in mind that fans supplied by different manufacturers may differ as to their highest rated fan speed." *Markman* Hr'g Tr. at 26:10-13.

c. "OR Circuit Means"

[4] Claim 1 of the '290 patent describes an "OR circuit means operative to generate an output signal substantially equal to the greatest of any input signal." '290 patent, col.6, 11.23-26. Control argued that an "OR circuit means" is simply a circuit that chooses between the greater of two signals. *Markman* Hr'g Tr. at 19:2-6; Pl.'s Mem. at 11. Delta countered that Control's proffered definition was too broad and that it had abandoned the broader definition during the patent prosecution. *Markman* Hr'g Tr. at 20:5-22. Delta noted that in response to a rejection by the examiner, Control amended the claim to include only a limited variety of OR circuits. Id. According to Delta, the definition of "OR circuit means" must include the limitation that the circuit generates an output signal that is substantially equal to the greater of the two input signals. Further, the two input signals must correspond to a fixed level signal that is independent of temperature and a variable level signal that is dependent on temperature.

After hearing oral argument and reviewing the claim language, the Court construed the claim term, in the form of a proposed address to the jury:

An OR circuit is a circuit that makes a choice. In this case, it makes the choice whether to run the fan at a temperature, at a fixed temperature speed or at a speed that is dependent on the temperature, that is, which runs faster as the temperature rises, or slower as the temperature drops.

Now, look, look down further and you'll see that it says ... they use the OR circuit to generate an output signal, that is, the signal that drives the apparatus, substantially equal to the greatest of any input signal.

Markman Hr'g Tr. 26:19 to 27:5.

2. '669 Patent**: "Substantially Equal"**

[5] Claim 1 of the '669 patent includes the limitation that "the change in exhaust temperature ... is substantially equal to the change in temperature rise of a typical one of said heat-generating elements over said range of air flow rates." '669 patent, col.6, 11.28-33. Delta argued that "substantially equal" simply means "nearly the same." *Markman* Hr'g Tr. at 23:7-8. Control again adopted a more functional approach. Both in its papers and at oral argument, Control asserted that "substantially equal" is not limited to a specific value or an exact equality of temperature changes. Pl.'s Opp'n at 17; *Markman* Hr'g Tr. at 25: 1-5. Instead, Control asserted that "substantially equal" refers to the difference in temperature rise necessary to maintain a semiconductor junction at a nearly constant temperature.

There is nothing in the claim or written description, however, that suggests that "substantially equal" should be given anything other than its ordinary meaning. The goal of the patent is to maintain the heat-generating elements at a nearly constant temperature. The patent teaches that to achieve this, the difference in temperature rise exhibited by a typical semiconductor is nearly the same as the difference in exhaust temperature. '669 patent, col.5, 11.6-12. Indeed, the example provided in the patent uses the numerical

quantity of three degrees to describe the "match" in temperature changes. Id. col.5, 11.8-9. According to the prosecution history, this "critical matching ... is at the heart of [the] invention." Katz Decl. Ex. D at C00124. Control's claim construction essentially wipes out the "substantially equal" language in favor of a functional test that simply asks whether the heat-generating elements are maintained at a nearly constant temperature, regardless of the means employed to achieve that goal.

Ultimately the Court construed "substantially equal" as "nearly the same." *Markman* Hr'g Tr. at 31:18. The Court then contextualized its definition in the form of a proposed address to the jury:

But you have to keep in mind what we are comparing here. That means, that substantially equal means nearly the same and what it requires, what it claims here is a relationship between the difference in temperature rise of a typical semiconductor and the temperature range of the exhaust air.

Id. at 31:18-23.

D. The Accused Product

Twenty-five Delta fans (the "accused fans") allegedly infringe the '290 and '669 patents. Defs.' Mem.App. A. The accused fans are controlled by a particular Toshiba chip. The Toshiba chip is described by its data sheet as an integrated circuit that automatically changes a fan motor's speed by detecting temperature through an externally mounted thermistor. Lehman Decl. Ex. B at DEL001350. Delta's expert, Dr. Brad Lehman, further described the chip as a " *subtraction* circuit that subtracts two input currents and produces an output current that controls the fan speed as a function of temperature." Id. para. 39; id. Ex. B at DEL001352.

Like Control's invention, the Toshiba chip produces a minimum speed at which the fan runs. Although the minimum can be set to any value, the Toshiba data sheet identifies "half-speed" as an appropriate and reliable value. Id. Ex. B at DEL001350, DEL001352. Prior to purchasing a fan, however, customers specify the minimum and maximum speed necessary to meet their needs. Yu Decl. para. 6. Delta engineers then set the temperature and speed ranges of the fans based on the customer's specified values. Id. para. 9.

The Toshiba chip alone does not infringe. In fact, the data sheet supplied with the chip specifically states: "The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use." Lehman Decl. Ex. B at DEL001350. The crux of this dispute concerns the capabilities of the Toshiba chip combined with Delta's adjustments to its fans.

II. SUMMARY JUDGMENT ANALYSIS

A. Relevant Legal Standard

Immediately following the *Markman* hearing, although in a separate proceeding, the Court heard argument on the pending summary judgment motion. Delta argued that a comparison of the construed claims with the accused products entitled it to a judgment of literal non-infringement as well as non-infringement under the doctrine of equivalents.

Summary judgment is appropriate when there is no genuine issue as to any material fact and the moving

party is entitled to a judgment as a matter of law. Fed.R.Civ.P. 56(c). Nonetheless, the Court must view the evidence in the light most favorable to the non-moving party. Pfaff v. Wells Elecs., Inc., 5 F.3d 514, 517 (Fed.Cir.1993). In considering a motion for summary judgment, the Court relies upon any "pleadings, depositions, answers to interrogatories, and admissions on file, together with the affidavits," which in toto comprise the relevant record. Rotec Indus., Inc. v. Mitsubishi Corp., 215 F.3d 1246, 1250 (Fed.Cir.2000) (quoting Fed.R.Civ.P. 56[c]).

With these considerations in mind, the Court addresses the legal issue whether, on the summary judgment record, Delta's fans infringe Control's '290 or '669 patent either literally or under the doctrine of equivalents.

B. Literal Infringement

[6] A two-step analysis is performed to determine whether an accused device literally infringes a patent claim. CAE Screenplates Inc. v. Heinrich Fiedler GmbH & Co. KG, 224 F.3d 1308, 1316 (Fed.Cir.2000). "First, the claims must be correctly construed to determine the scope of the claims. Second, the claims must be compared to the accused device." Kahn v. Gen. Motors Corp., 135 F.3d 1472, 1476 (Fed.Cir.1998). If the accused product meets each of the limitations contained in a claim, then the product literally infringes the patent. If, however, even one limitation is not met, then the product does not literally infringe. Therefore, "any deviation from the claim precludes a finding of literal infringement." Litton Sys., Inc. v. Honeywell, Inc., 140 F.3d 1449, 1454 (Fed.Cir.1998), *abrogated on other grounds by* Festo, 234 F.3d 558.

1. '290 Patent

Delta asserts that its accused fans do not literally infringe the '290 patent "because at least four claim elements are not met." Defs.' Mem. at 16.

First, Delta avers that the Toshiba chip does not have a "fixed level control signal." It must be noted at the start that the parties do not agree even on what element of the Toshiba chip, if any, is comparable to the "fixed level control signal" limitation in the '290 patent. Delta identifies the "HS signal" while Control contends that it is the "R_{ref} signal." Kundert Decl. para.para. 25, 31-32. A finding of no literal infringement at the summary judgment stage is thus possible only if neither the HS signal nor the R_{ref} signal acts as a "fixed level control signal."

Delta asserts that the HS signal is not a "fixed level signal" but rather a "ramp signal" because the signal increases and decreases in value in a sawtooth pattern. Control counters that the use of "fixed" in the limitation does not refer to voltage or amplitude but rather a signal that operates independent of temperature. Moreover, according to Control, both the HS signal and the R_{ref} signal meet this definition.

This battle was fought and lost by Delta during the *Markman* hearing. At that time, Delta argued that "fixed level" refers to a specific value, such as four volts. This argument was rejected by the Court. Instead, the Court construed "fixed level" as "a constant level, that is, one which does not vary according to external temperature." *Markman* Hr'g Tr. at 11:11-13. Delta proffers no evidence that its accused fans lack this element.

Second, Delta asserts that the accused fans have minimum speeds that are not equal to half maximum as required by the '290 patent. The Court construed half maximum to be roughly fifty percent of the maximum rated speed. According to Delta's calculations, twenty of the twenty-five FN8 accused fans deviate from half

maximum as defined by the Court. Defs.' Mem. Ex. B. If Delta's math is correct, then these fans do not literally meet the claim limitation of half of the maximum rated speed.

FN8. Delta admits that five of its fans do meet the half-maximum requirement. Defs.' Mem. at 16 n. 7; id. Ex. B. Delta contends, however, that these fans were never sold.

Control counters by challenging Delta's arithmetic. According to Control's expert, Kundert, Delta's calculations failed to account for the fifteen percent variation in speed caused by the thirty percent variation in the internal resistor. Kundert Decl. para. 27. To support this conclusion, Kundert points to the Toshiba data sheet, which states that "a fluctuation of (plus-or-minus sign) 30% is permitted." Id. Ex. B at DEL001352. Based on this discrepancy, Kundert posits that eleven of the remaining twenty fans run at a minimum speed between forty-seven and fifty-three percent. In addition, Kundert notes that the Toshiba data sheet references "half-speed" on numerous occasions. Id. para. 29 (citing id. Ex. B at DEL001350, DEL001356-57).

Delta responds that Kundert's declaration is insufficient to avoid summary judgment. To support this statement it cites Arthur A. Collins, Inc. v. Northern Telecom Ltd., 216 F.3d 1042 (Fed.Cir.2000). In that case, the Federal Circuit reiterated the well settled maxim that an expert's unsupported conclusions are insufficient to raise a genuine issue of material fact. Id. at 1046.

Kundert's statements are not unsupported, however. He references multiple places in the record that raise a genuine issue of fact whether the accused fans operate at half maximum speed. In contrast, the expert in *Collins* failed to identify specific facts supporting his conclusions. *Id*. at 1047. Moreover, the documents the *Collins* expert did reference actually undermined his conclusions. *Id*. Not so here. Based on Kundert's declaration, there remains a genuine issue of material fact whether the accused fans operate at half maximum speed.

Third, Delta avers that the accused fans lack the claimed "OR circuit means." The OR circuit means in the '290 patent generates an output signal that is substantially equal to the greater of two input signals. The two input signals are a fixed level signal that is independent of temperature and a variable level signal that is dependent on temperature.

Initially, Delta argues that the Toshiba chip in its fans does not have a means that "chooses" between two signals. The "I/R Conv" block identified by Control as the "OR circuit means" in the accused fans is described as a "subtraction circuit" by Delta's expert. Lehman Decl. para. 39. A subtraction circuit takes the difference between the two input signals, one independent of temperature and one dependent on temperature, and generates an output signal. Id. Thus, according to Delta, the "I/R Conv" block is not "choosing" between the two input signals.

Control counters that it is not possible to transition from temperature-independent speed to temperature-dependent speed without an OR circuit. Kundert Decl. para. 34. The label "subtraction circuit" does not alter the fact that the "I/R Conv" block is choosing between two signals, Q93 and Q97. Id. para. 32. To support this theory, Kundert points to the Toshiba data sheet. Id. Ex. B. Under the heading "Detecting temperature and controlling rotations," the Toshiba data sheet states that the chip *compares* the two input signals. Id. at DEL001352. In addition, the data sheet indicates that the number of rotations will increase from the minimum when R_{VR} is less than or equal to R_{ref}. Id. at DEL001353. Kundert posits that this is exactly how

the "OR circuit means" works in the '290 patent.

Even if the Court were to accept Kundert's explanation that the "subtraction circuit" is a de facto "OR circuit," however, there is additional claim language to be addressed. Specifically, the OR circuit must "generate an output signal that is substantially equal to the greatest of any input signal applied thereto." '290 patent, col.6, ll.24-26. The Court explicitly included this as part of the claim construction. *Markman* Hr'g Tr. at 27:1-5. Delta argues that the Toshiba chip outputs the difference between the two input signals, not the greater of the two signals, and consequently does not meet the literal requirements of the claim limitation. Delta's expert and the Toshiba data sheet support the argument. Lehman Decl. para. 39; id. Ex. B at DEL001352. On the same page Kundert cites to support his conclusion, the data sheet states that the motor "is controlled using the difference between the current at the TH terminal ... and another internal reference current." Id.

Kundert responds by referring the Court to a more detailed schematic diagram of the Toshiba chip. Kundert Decl. para. 32. According to Kundert "[t]he current passing through Q97 (which is equal to the current passing through the temperature-sensing thermistor) is *compared* to the current passing through Q93 (which is equal the current passing through the fixed resistance, R_{ref}). When the Q97 current exceeds the Q93 current, [the fan speed increases]." Id. Based on his understanding of the schematic diagram, Kundert asserts that the "subtraction circuit" literally infringes the "OR circuit means" described in the '290 patent.

Because of the fundamental conflict in expert testimony, there remains a genuine issue of material fact whether the accused fans literally infringe each limitation of the '290 patent. As a result, summary judgment must be DENIED.

2. '669 Patent

[7] Delta argues that "there is no evidence that any of Delta's customer's equipment [has] a difference in temperature rise of the semiconductor junction that is 'substantially equal' (i.e., *matched*) to the change in exhaust air temperature as required by claim 1 [of the '669 patent]." Defs.' Mem. at 19. Moreover, according to Delta, its engineers do not have the information necessary to achieve such a result. Speed and temperature parameters are set by Delta's customers. Yu Decl. para.para. 6, 9. Delta's engineers do not know the precise components being cooled nor are they aware of the arrangement of the components cooled by the accused fans. Id. para. 8. Further, the engineers are unaware of the thermal resistance of the devices, the power dissipation of each of those devices, and the junction temperatures of the components being cooled. Id. para.para. 10-11.

By demonstrating that the evidence in the record is insufficient to avoid a directed verdict, Delta has discharged its initial responsibility at the summary judgment stage. Celotex Corp. v. Catrett, 477 U.S. 317, 323, 106 S.Ct. 2548, 91 L.Ed.2d 265 (1986). In response, Control is required to designate specific facts showing that there is a genuine issue for trial. Anderson v. Liberty Lobby, Inc., 477 U.S. 242, 248-50, 106 S.Ct. 2505, 91 L.Ed.2d 202 (1986); Collins, 216 F.3d at 1046; Millipore Corp. v. Travelers Indem. Co., 115 F.3d 21, 34 (1st Cir.1997).

Control again relies on the expert testimony of Kundert in an attempt to avoid summary judgment. According to Kundert, the fact that Delta's engineers lack specific information does not preclude the possibility that the accused fans infringe on the '669 patent. Kundert Decl. para. 42. The proper difference in temperature taught by the patent "is best done by making routine, 'hands on' adjustments for a specific

application." Id.

Control's proffer fails as matter of law. Unlike Kundert's specific statements about the Toshiba chip as it related to the '290 patent, here, he fails to identify "specific facts sufficient to avoid summary judgment." Collins, 216 F.3d at 1046. "Where an expert presents 'nothing but conclusions-no facts, no hint of an inferential process, no discussion of hypotheses considered and rejected', such testimony will be insufficient to defeat a motion for summary judgment." Hayes v. Douglas Dynamics, Inc., 8 F.3d 88, 92 (1st Cir.1993) (quoting Mid-State Fertilizer v. Exch. Nat'l Bank, 877 F.2d 1333, 1339 [7th Cir.1989]). There is nothing in the record to suggest that the '669 patent is infringed by the accused fans. Despite the fact that Control received eight Toshiba chips for testing, Defs.' Reply Ex. A, it failed to proffer any evidence to support its theory of infringement.

Consequently, summary judgment of literal non-infringement of the '669 patent is GRANTED.

C. Doctrine of Equivalents

Delta also contends that the accused fans do not infringe Control's patents under the doctrine of equivalents. In the alternative, it asserts that Control is estopped from arguing a range of equivalents pursuant to prosecution history estoppel.Prosecution history estoppel is a powerful argument in light of the Federal Circuit's recent decision in *Festo,* a decision that essentially stops the doctrine of equivalents in its tracks.

In theory, "[a] device which does not infringe a patent claim literally may still infringe the claim under the doctrine of equivalents if each and every limitation of the claim is literally or equivalently present." CAE Screenplates, 224 F.3d at 1318-19. A claim limitation is equivalently present if there are only "insubstantial differences" between the limitation and the corresponding elements of the device. Id. at 1319 (citing Hilton Davis Chem. Co. v. Warner-Jenkinson Co., 62 F.3d 1512, 1517-18 [Fed. Cir.1995], *rev'd on other grounds,* 520 U.S. 17, 117 S.Ct. 1040, 137 L.Ed.2d 146 [1997]). Ordinarily, the question of infringement by equivalents is an issue of fact reserved for the jury, but "[w]here the evidence is such that no reasonable jury could determine two elements to be equivalent, district courts are obliged to grant partial or complete summary judgment." Warner-Jenkinson Co. v. Hilton Davis Chem. Co., 520 U.S. 17, 39 n. 8, 117 S.Ct. 1040, 137 L.Ed.2d 146 (1997). As with literal infringement, the doctrine of equivalents must be applied to individual limitations of the claim, not to the invention as a whole. Id. at 29, 117 S.Ct. 1040.

In *Warner-Jenkinson,* the Supreme Court affirmed the vitality of the doctrine of equivalents but "endeavor[ed] to clarify [its] proper scope." Id. at 21, 117 S.Ct. 1040. The Supreme Court began with a review of its decision in Graver Tank & Mfg. Co. v. Linde Air Prods. Co., 339 U.S. 605, 70 S.Ct. 854, 94 L.Ed. 1097 (1950), which "set out the modern contours of what is known in patent law as the 'doctrine of equivalents,' " Warner-Jenkinson, 520 U.S. at 21, 117 S.Ct. 1040. There the Supreme Court observed that:

What constitutes equivalency must be determined against the context of the patent, the prior art, and the particular circumstances of the case. Equivalence, in the patent law, is not the prisoner of a formula and is not an absolute to be considered in a vacuum .... Consideration must be given to the purpose for which an ingredient is used in a patent, the qualities it has when combined with the other ingredients, and the function which it is intended to perform.

Id. at 24-25, 117 S.Ct. 1040 (quoting Graver Tank, 339 U.S. at 609, 70 S.Ct. 854). Despite the various policy arguments proffered by the petitioner, the Supreme Court declined to overrule the well-established

precedent on the doctrine of equivalents. *Id.* at 28, 117 S.Ct. 1040. In so doing, the Supreme Court noted that such policy arguments are best directed toward Congress because "Congress can legislate the doctrine of equivalents out of existence any time it chooses." *Id.* Although the Supreme Court tweaked the doctrine of equivalents in *Warner-Jenkinson,* it by no means overturned it.

[8] Admittedly, the doctrine of equivalents is not without difficulties. The Supreme Court acknowledged that "the doctrine of equivalents, as it has come to be applied since *Graver Tank,* has taken on a life of its own, unbounded by the patent claims." Id. at 28-29, 70 S.Ct. 854. As a result, prosecution history estoppel has become an essential limitation on the doctrine of equivalents. In essence, a patent owner can be estopped from employing the doctrine of equivalents to recover subject matter that was relinquished, either by amendment or argument, during the prosecution of the patent. CAE Screenplates, 224 F.3d at 1319; Pharmacia & Upjohn Co. v. Mylan Pharm., Inc., 170 F.3d 1373, 1376-77 (Fed.Cir.1999).

Prosecution history estoppel has long existed in patent law. As with most forms of estoppel, it was borne of equity and common sense. If a patent application originally claimed "AB," but the applicant was forced to narrow the claim to "A" to obtain the patent, neither equity nor common sense allows the claim to be later construed to include "B."

In *Warner-Jenkinson,* the Supreme Court explained its prosecution history estoppel jurisprudence. "In each of our cases ... prosecution history estoppel was tied to amendments made to avoid the prior art, or otherwise to avoid a specific concern-such as obviousness-that arguably would have rendered the claimed subject matter unpatentable." Warner-Jenkinson, 520 U.S. at 30-31, 117 S.Ct. 1040. To model the application of prosecution history estoppel, the Supreme Court cited Keystone Driller Co. v. Northwest Engineering Corp., 294 U.S. 42, 55 S.Ct. 262, 79 L.Ed. 747 (1935). There, "estoppel was applied where the initial claims were 'rejected on the prior art' and where the allegedly infringing equivalent element was outside of the revised claims and within the prior art that formed the basis of the rejection of the earlier claims." Warner-Jenkinson, 520 U.S. at 31, 117 S.Ct. 1040 (citations omitted).

Following the Supreme Court's decision in *Warner-Jenkinson,* the Federal Circuit expounded on the application of prosecution history estoppel in *Festo*. The Federal Circuit addressed five specific questions regarding prosecution history estoppel and the doctrine of equivalents. For the purposes of this motion, the Court need only concern itself with Questions 1 and 3. Question 1 asked what types of claim amendments trigger prosecution history estoppel, Festo, 234 F.3d at 566-68, and Question 3 asked what range of equivalents, if any, is available if prosecution history estoppel applies, id. at 569-78. According to the Federal Circuit, these questions were left unanswered by the Supreme Court in its myriad decisions addressing the doctrine of equivalents and prosecution history estoppel.

[9] With respect to Question 1, the Federal Circuit held that "a narrowing amendment made for any reason related to the statutory requirements for a patent will give rise to prosecution history estoppel with respect to the amended claim element." Id. at 566. The Federal Circuit noted that the Supreme Court in *Warner-Jenkinson* primarily discussed amendments made to overcome the prior art, but clarified that any amendment for any reason related to *any* of the statutory requirements for a patent will trigger prosecution history estoppel. Id. at 567.

[10] With respect to Question 3, a majority of the Federal Circuit determined that "[w]hen a claim amendment creates prosecution history estoppel with regard to a claim element, there is no range of equivalents available for the amended claim element. Application of the doctrine of equivalents to the claim

element is completely barred...." Id. at 569. According to the Federal Circuit, a "complete bar" is necessary to eliminate speculation and uncertainty as to the exact range of equivalents that a patentee can assert. Id. at 575-76. This result reinforces the notice function of claims, thereby enabling the public to determine the scope of a patent without resorting to litigation and fostering innovations that might otherwise have lain dormant due to the fear of an infringement suit. Id. at 576-77.

The answer to Question 3 is jarring in its bright-line, rigid approach, as well as in its apparent departure from established precedent. The "complete bar" approach was by no means unanimous. Four of the twelve judges in *Festo,* Judges Michel, Rader, Linn, and Newman, wrote thorough and articulate dissents. This Court can add nothing to the historical, precedential, theoretical, and practical concerns raised by these dissenters.

1. '290 Patent

[11] Delta asserts that the limitations "half maximum" and "OR circuit means" in the '290 patent were sufficiently narrowed during prosecution to prevent Control from arguing a range of equivalents. Defs.' Mem. at 18.

a. "Half Maximum"

Control argues that "half maximum" is a floor for typical cooling and acceptable noise, not a precise arithmetic measurement. According to Control, Delta is infringing this limitation under the doctrine of equivalents if its fan speed range is "large enough to sufficiently cool the components, and operate with high reliability (no stalling), but small enough that acoustical noise is at an acceptable level." Pl.'s Opp'n at 10 (internal quotation marks omitted).

Delta counters that Control is estopped from arguing a range of equivalents for this claim limitation. *Festo* instructs that if a narrowing amendment was made for any reason related to patentability, prosecution history estoppel arises. Festo, 234 F.3d at 566. There is no question that such is the case here. Specifically, Control amended its original claim to avoid prior art by replacing the limitation "preselected minimum" with the limitation "half maximum." Katz Decl. Ex. B at C00024, C00036-37, C00047-48. The reason for this particular amendment was set forth in the prosecution history. Control stated that "[t]o further aid in distinguishing from [the prior art], each of the independent claims has been amended to recite that the fixed level corresponds to 'one-half maximum fan speed' since this level has been found highly advantageous." *Id.* at C00047-48. Thus, there is little doubt that Control amended the claim because of questions related to patentability.

Moreover, the record evidences that the amendment narrowed the scope of the claim from the broader "preselected minimum" to the more precise "one-half maximum speed." Control's amendments indicate that it was not claiming just any minimum or floor, but a specific floor of roughly half maximum. *Id.* at C00059.

To all intents and purposes, this Court's inquiry is finished. Application of the doctrine of equivalents to this claim limitation is completely barred. Festo, 234 F.3d at 569.

Such a cursory examination of the prosecution history, however, seems ill-suited to undergird such a dramatic result. Prior to *Festo,* the work of counsel and the court would have just begun. Indeed, in *Warner-Jenkinson,* the Supreme Court suggested that estoppel is not a mechanical inquiry. In reviewing its prosecution history estoppel precedent, the Supreme Court opined that estoppel was applied when the initial

claim had been rejected due to a statutory defect *and* where the allegedly infringing element was outside of the revised claim but within the basis for the rejection of the earlier claim. Id. at 31, 117 S.Ct. 1040 (citing Keystone Driller, 294 U.S. at 48, 55 S.Ct. 262). It is this second aspect of the analysis that is conspicuously absent from the *Festo* decision.FN9

FN9. Its absence, however, is not remarkable to a majority of the Federal Circuit. In response to Judge Michel's dissent, the majority reviewed a portion of the applicable precedent and determined that "the Supreme Court has not fully addressed the range of equivalents that is available once prosecution history estoppel applies." Festo, 234 F.3d at 571. The apparent lack of guidance resulted in the majority's decision that it was required to "independently decide the issue." *Id*. According to the majority, the issue of the range of equivalents available when prosecution history estoppel applies is "properly reserved for this court to answer with 'its special expertise.' " *Id*. at 572 (citing Warner-Jenkinson, 520 U.S. at 40, 117 S.Ct. 1040). It is not clear what role, if any, Supreme Court precedent plays in issues "properly reserved" for the Federal Circuit.

A thorough review of the prosecution history here compels the conclusion that Control did not abandon the entire range of minimum fan speeds. Initially, Control's limitation of a "preselected minimum" was rejected in light of the prior art. As a result, Control retreated to claim a minimum speed of half maximum. This, too, was rejected by the examiner. The file wrapper notes that "for the preselected fan speed to correspond to 'half maximum' is seen to be only an obvious matter of engineering design." Katz Decl. Ex. B at C00053. To distinguish its invention from prior art, Control remarked, "applicant also wishes to point out that none of the prior art teaches or suggests setting a minimum speed which is as high as 'half maximum.' In applicants' intended operating environment a minimum speed that high is fairly critical...." *Id*. at C00059. Based on this representation the claim was allowed.

A reasonable inference from the prosecution history is that Control intended to abandon all minimum speeds *below* half maximum. Of this there is little doubt. Indeed, a competitor seeking to discern the scope of the patent could sensibly assume that a minimum speed below half maximum was not infringing. Prior to *Festo,* however, a question may have remained whether minimum fan speeds above half maximum were also surrendered. In the case at bar, twenty-four of the twenty-five accused fans have minimum speeds at or above half maximum. Defs.' Mem. Ex. B. The accused fans are neither within the prior art that formed the basis of the rejection nor are they arguably within the scope of the revised claim. This analysis is of little consequence or solace to Control, however. *Festo* completely bars the application of the doctrine of equivalents to the claim limitation "half maximum fan speed."

b. "OR Circuit Means"

[12] As with the "half maximum" limitation, there remains a triable issue as to literal infringement of the "OR circuit means" limitation. Control now argues that the "OR circuit means" limitation also is infringed under the doctrine of equivalents. Delta again asserts that "prosecution history estoppel precludes [Control] from arguing a range of equivalents for the 'OR circuit' wide enough to encompass Delta's fans." Defs.' Mem. at 18.

Plugging the prosecution history into the *Festo* formula, the Court rules that Control is completely barred from arguing the doctrine of equivalents for "OR circuit means." In one of its original patent applications, Control claimed a "circuit means for providing to said triggering circuit an input signal which corresponds

to a logical ORing of said fixed and variable control signals." Katz Decl. Ex. B at C00045. The examiner rejected the language because "the triggering circuits shown by [the prior art] meet this claim language." *Id*. at C00053. In response Control amended its claim to state:

OR circuit means operative to generate an output signal substantially equal to the greatest of any input signal applied thereto, said fixed and variable control signals being applied to said OR circuit as inputs with said OR circuit means output signal being applied to said power control means as the input signal level.

Id. at C00058. Control acknowledged in its remarks that the amendment was made to fully support the distinction over the prior art because the previous definition of "the ORing function [was] overly broad." *Id*. at C00059.

Because the narrowing amendment was made to achieve patentability, the application of the doctrine of equivalents to this claim limitation is completely barred. Festo, 234 F.3d at 569.

2. '669 Patent

Based on the same reasoning employed under the literal infringement analysis for the '669 patent, summary judgment of non-infringement under the doctrine of equivalents is also GRANTED.

III. CONCLUSION

Summary judgment of literal non-infringement [Docket No. 37] is DENIED with respect to the '290 patent. Control is barred, however, from arguing the doctrine of equivalents as to the claim limitations "half maximum fan speed" and "OR circuit means" in the '290 patent. Summary judgment of non-infringement [Docket No. 37] is GRANTED with respect to the '669 patent.

D.Mass.,2001.
Control Resources, Inc. v. Delta Electronics, Inc.