

United States District Court,
D. Oregon.

EDWARDS SYSTEMS TECHNOLOGY, INC., a Connecticut corporation,
Plaintiff.

v.

DIGITAL CONTROL SYSTEMS, INC., an Oregon corporation,
Defendant.

No. Civ. 00-1365-AS

March 12, 2002.

Jeff S. Pitzer, Law Offices of Jeff S. Pitzer, Portland, OR, Andrew A. Jacobson, Daniel J. Hurtado, Daniel J. Schwartz, Ross B. Bricker, Sally K. Sears Coder, Jenner & Block LLC, Chicago, IL, for Plaintiff.

Alexander C. Johnson, Jr., James E. Harris, Joseph S. Makuch, Marger Johnson & McCollom, PC, Portland, OR, for Defendant.

FINDINGS AND RECOMMENDATION

ASHMANSKAS, Magistrate J.

Plaintiff Edwards Systems Technology, Inc. ("Plaintiff"), filed this action against Digital Control Systems, Inc. ("Defendant"), asserting that Defendant made, marketed and sold products which infringed upon United States Patent No. 5,163,332 (the "Patent") owned by Plaintiff. The parties have filed numerous motions which are presently before the court.

In the first motion for summary judgment, Defendant asks the court to construe the claims of the Patent and find that Defendant's product does not infringe on the Patent or, in the alternative, find that the Patent is invalid under Section 102 of the United States Patent Act, (35 U.S.C. s.s. 1 et seq.)(the "Act"), as anticipated by the prior art or under Section 103 as obvious over the prior art. The second motion for summary judgment, also filed by Defendant, seeks a ruling from the court that the Patent is invalid under Section 112 for failure to set forth the best mode contemplated by the inventor. The parties subsequently filed cross-motions for summary judgment asking the court to determine whether the Patent is valid under Section 132 and whether the Patent is enforceable under the doctrine of equitable estoppel. Also currently pending before the court is Defendant's motion to strike the second and third report of Plaintiff's expert Andrian Kouznetsov, Ph. D., as untimely.

BACKGROUND

In November 1991, Jacob Y. Wong filed an application for a patent to protect his unique gas sample chamber (the "Application"). The Application was a continuation-part-of an application filed October 26,

1990, which was a continuation-in-part of the application filed April 2, 1990 (the "Grandparent Application"), and issued October 29, 1991, as United States Patent No. 5,060,508. The Application issued as the Patent on November 17, 1992, after being thoroughly examined by the Patent and Trademark Office (the "Patent Office") and being revised a number of times by Wong.

Upon its issuance, the Patent was immediately assigned to Gaztech International Corporation. Subsequently, the Patent was assigned to Plaintiff, who is the current owner of the Patent.

Plaintiff, through its Telaire division, is a developer and manufacturer of gas analyzer products, including carbon dioxide monitors and sensors. Defendant is in the business of manufacturing and selling gas analyzer sensors and other products. Plaintiff asserts that certain products developed and marketed by Defendant infringe upon the Patent. Specifically, Plaintiff asserts that Defendant's AirSense Model 310 ("M310") carbon dioxide sensors incorporate the patented gas sample chamber.

Summary of the Prior Art

The first prior art referenced in the Patent is a patent issued on November 24, 1987, to Burough, *et al.*, teaching a method and apparatus for detecting gas ("Burough"). Burough consists of an elongated hollow tube that is made of a porous material with a sufficient pore size to allow gas to diffuse through it quickly by means of ambient pressure. An infrared source is located at one end of the tube with an optical filter and infrared detector located at the opposite end of the tube. Burough eliminated the need for a chopper and other motorized devices used in existing gas sample chambers.

The next prior art mentioned in the Patent is a Japanese patent issued in the early 1980's to Miyazaki for an infrared gas analyzer ("Miyazaki"). Miyazaki teaches a sample chamber that is described as a spiraled cylindrical tube. The sample gas is sucked into the sample chamber through a gas inlet aperture located in the wall of the tube and then pushed out of the chamber through a gas outlet chamber located in the wall of the tube at the opposite end of the inlet aperture. The spiraled tube offered a longer optical pathway without increasing the length of the tube to allow the accurate measurement of thin gases. Miyazaki also references infrared rays being reflected off the reflective surfaces inside the sample chamber and being guided to the transmission holes for reading by the detector. The inner surface of the chamber is treated with aluminum and an oxide cover film to protect against rust.

A patent issued to Miyatake, *et al.*, on February 12, 1985, describes a gas analyzer having a heated sample gas container intended to increase the radiation generated by a sample of gas while decreasing the background radiation ("Miyatake"). FN1 This gas analyzer works on an emissions principle rather than analyzing a unknown gas by its tendency to absorb a specific infrared wavelength. Miyatake reveals a mirror surface on the internal wall of the sample cell but does not teach the use of mirror surface to guide or transmit radiation in any particular way.

FN1. Miyatake was discussed in the Patent but a copy of Miyatake was not provided to the court. The summary of Miyatake was taken from the material found in the Patent.

In the late 1980's, the Japanese Patent Office issued a patent to Fujimura, *et al.*, for an air pollution detector used in automotive air conditioning equipment ("Fujimura"). The detector is described as a hollow tube that is open on both ends to allow air to move through the tube. The diameter of the air intake opening exceeds

the diameter of the air outlet opening which forces the air to accumulate in the chamber and, consequently, increases the density of the pollution. The air intake opening is covered by a dust filter. The detector is installed in the front of the car behind the bumper between the radiator grill and the radiator with the air intake opening toward the front of the car. The motion of the car forces the air into the air intake opening and, eventually, out the air outlet opening.

The last piece of prior art mentioned in the Patent was issued on June 29, 1976, to Vennos for a fluid sampling device that includes a pump ("Vennos"). FN2 The device is used to collect a sample of air particles but does not use infrared radiation to calculate the levels of any particular gases.

FN2. Like Miyatake, Vennos was mentioned in the Patent but the court was not provided with a copy of Vennos. The summary of Vennos was taken from the material found in the Patent.

Summary of the Patent

The gas sample chamber described in the Patent consists of a hollow, elongated tube made of a nonporous material that is open on both ends. The tube has more than one hole located in the wall of the tube which is covered with a filter that allows the gases in the air to move freely into and out of the tube without allowing dust or smoke into the tube. The interior walls of the tube are either polished or covered with a coating to allow the light rays introduced into the sample chamber to move through the chamber to the opposite ends by means of reflection of the interior walls.

PRELIMINARY PROCEDURAL MATTER

Defendant moves to strike the Second and Third Affidavits of Adrian Kouznetsov, Ph. D., Director of Engineering for Telaire, as untimely and to allow the filing of a surrebuttal brief. The two affidavits were filed with the court on May 25, 2001, and June 4, 2001, respectively, both after the expert rebuttal report date of April 20, 2001, and the expert discovery deadline of May 18, 2001. Defendant contends that the new affidavits contain new testimony and exhibits which Defendant's experts have not had time to review. Defendant also asserts that they have not had the opportunity to depose Dr. Kouznetsov with regard to the new information.

The court recommends granting Defendant's motion to file its surrebuttal brief and has considered Defendant's surrebuttal brief in its consideration of Defendant's motion for summary judgment. After the filing of the motion to strike and before the court heard oral argument on Defendant's motion for summary judgment, Defendant deposed Dr. Kouznetsov and presented additional evidence to the court. Based on this additional discovery of Plaintiff's experts, the court finds that Defendant was not unduly prejudiced by the submission of the untimely affidavits. The court recommends denying Defendant's motion to strike.

LEGAL STANDARD

Rule 56 of the Federal Rules of Civil Procedure allows the granting of summary judgment:

if the pleadings, depositions, answers to interrogatories, and admissions on file, together with the affidavits, if any, show that there is no genuine issue as to any material fact and that the moving party is entitled to a judgment as a matter of law.

Fed.R.Civ.P. 56(c). "[T]he requirement is that there be no *genuine* issue of *material* fact." *Anthes v. Transworld Systems, Inc.*, 765 F.Supp. 162, 165 (Del.1991) (citing *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 247-48, 106 S.Ct. 2505, 91 L.Ed.2d 202 (1986))(emphasis in original).

The movant has the initial burden of establishing that no genuine issue of material fact exists or that a material fact essential to the nonmovant's claim is absent. *Celotex v. Catrett*, 477 U.S. 317, 322-24, 106 S.Ct. 2548, 91 L.Ed.2d 265 (1986). Once the movant has met its burden, the onus is on the nonmovant to establish that there is a genuine issue of material fact. *Id.* at 324. In order to meet this burden, the nonmovant "may not rest upon the mere allegations or denials of [its] pleadings," but must instead "set forth specific facts showing that there is a genuine issue for trial." Fed.R.Civ.P. 56(e); see *Celotex*, 477 U.S. at 324.

An issue of fact is material if, under the substantive law of the case, resolution of the factual dispute could affect the outcome of the case. *Anderson*, 477 U.S. at 248. Factual disputes are genuine if they "properly can be resolved only by a finder of fact because they may reasonably be resolved in favor of either party." *Id.* at 250. On the other hand, if after the court has drawn all reasonable inferences in favor of the nonmoving party, "the evidence is merely colorable, or is not significantly probative, summary judgment may be granted." *Id.* at 249-50 (citations omitted).

DISCUSSION

A literal patent infringement analysis involves two steps: the proper construction of the asserted claims and a determination of whether the accused product infringes the asserted claim as properly construed. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 976 (Fed.Cir.1995)(en banc), aff'd 517 U.S. 370, 116 S.Ct. 1384, 134 L.Ed.2d 577 (1996). The construction of patent claims, including terms of art within the claims, is a matter of law exclusively for the court. *Id.* at 979. Literal infringement requires that the accused device include every limitation of the patent claim and is a question of fact. *SRI Int'l v. Matsushita Elec. Corp. of Am.*, 775 F.2d 1107, 1118 (Fed.Cir.1985)(en banc).

Claim Construction

In determining the proper construction of the claim, the court looks first to the language of the claim itself. *Markman*, 52 F.3d at 979. It is the claims that define the claimed invention. *York Products, Inc. v. Central Tractor Farm & Family Center*, 99 F.3d 1568, 1572 (Fed.Cir.1996). Similarly, it is the claims, not the specifications or the particular examples or embodiments set forth in the specifications, that are infringed or anticipated. *Constant v. Advanced Micro-Devices, Inc.*, 848 F.2d 1560, 1571 (Fed.Cir.1988); *SRI Int'l*, 775 F.2d at 1121.

Terms in a claim are given their ordinary meaning, determined with a view to one skilled in the art, unless it appears from the patent that the inventor used the terms differently. *Intellicall, Inc. v. Phonometrics, Inc.*, 952 F.2d 1384, 1387 (Fed.Cir.1992). A patentee may be his own lexicographer but any special definition given to a word must be clearly defined in the specification. *Id.* at 1388. Accordingly, "it is always necessary to review the specification to determine whether the inventor has used any terms in a manner inconsistent with their ordinary meaning." *Vitronics Corporation v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed.Cir.1996).

The patent specification contains a written description of the preferred embodiment of the invention with sufficient detail to allow one possessing ordinary skill in the art to make and use the invention. As such, the

specification acts as a dictionary or road map for the invention and may, either expressly or by implication, define terms used in the claims. *Markman*, 52 F.3d at 979. Although the patent specification should be consulted for help in interpreting the claims, limitations cannot be read into a claim from the specification apart from a need to interpret the meaning of a particular word or phrase. *E.I. Du Pont De Nemours & Co., v. Phillips Petro.*, 849 F.3d 1430, 1433 (Fed.Cir.), cert. denied, 488 U.S. 986 (1988).

Where relevant, the court should also consider the patent's prosecution history when construing claim language. *Markman*, 52 F.3d at 980. Finally, extrinsic evidence, such as expert and inventor testimony, dictionaries and learned treatises, may be used by the court to assist in claim construction. *Id.*

Claim 1 of the Patent reads:

A diffusion-type gas sample chamber for transmitting radiation through gases present in the chamber only by ambient pressure diffusion through a plurality of filtering apertures formed in the chamber walls, comprising in combination:

a) an elongated hollow tube composed of a gastight material and having a specularly-reflective surface on its inner walls for transmitting radiation introduced at one end of said tube to the other end of said tube by means of multiple reflections from said specularly-reflective surface;

b) said tube including a plurality of filtering apertures arrayed along said tube for improving the diffusion into and out of the space within said tube; and,

c) a sheet of a semipermeable FN3 membrane covering each of said plurality of filtering apertures, said semipermeable membrane permitting gases to diffuse through it under ambient pressure into and out of the space within said tube and preventing airborne particles larger than a predetermined size from entering said space.

FN3. In the interest of consistency, the court does not hyphenate the "semipermeable" in this opinion. This includes instances where the court quotes the language of the Patent where the term was occasionally hyphenated.

The parties disagree about the proper interpretation of the terms "specularly reflective," "plurality of apertures arrayed along," "semipermeable membrane," "elongated hollow tube," and "multiple reflections."

- Specularly-Reflective Surface

Defendant contends that the term "specularly-reflective surface" should be literally construed to mean "mirror like" whereas Plaintiff contends that the term should have the more general interpretation of "having sufficient reflectivity to conduct radiation at one end of the chamber to the other." The court finds that the more general definition complies with the purpose of the chamber and is more consistent with the language of the Patent.

The claim specifically indicates that the purpose of the "specularly-reflective surface" is to transmit "radiation introduced at one end of said tube to the other end of said tube by means of multiple reflections from said specularly-reflective surface." The abstract describes the tube as "having an inwardly-facing

specularly-reflective surface that permits the tube to function also as a light pipe for transmitting radiation from a source to a detector through the sample gas." Similarly, the summary of the invention explains:

It is the first objective of the diffusion-type gas sample chamber of the present invention to serve as a light pipe to efficiently conduct radiation from a source through a gas sample to a detector * * *."

* * *

In accordance with a preferred embodiment of the invention, the inwardly-facing surface of the sample chamber is specularly-reflective to serve as a light pipe to conduct radiation introduced at one end of the elongated sample chamber by a source to a detector located at the other end of the sample chamber.

In the detailed description of the preferred embodiment, which is also referred to as the specification, the body of the gas sample chamber is described as:

an elongated hollow tube of nonporous (gastight) material having an inwardly-facing specularly-reflective surface. In the preferred embodiment, this surface is a unitary portion of the inner surface of the tube while, in an alternative embodiment, the surface may be an applied coating or a layer of a specularly-reflective material.

A diagram supporting the preferred embodiment illustrates "the optical path taken by a typical ray emitted by the source as the ray is multiply reflected while passing down the length of the tube portion of the gas sample chamber, and eventually falls on the detector." The illustration shows a ray originating from the source and moving toward the detector by reflecting off the wall of the tube in the direction of the reflector at the same angle in which it struck the tube. The ray reflects off the wall of the tube a total of three times before it hits the detector.

The Patent touches upon the idea of a specularly-reflective surface in discussing and distinguishing the prior art. The Patent notes that the gas sample chamber of Burough consists of a tube composed of a porous material and has no "teaching or suggestion of using the walls of the porous tubes as reflective radiation-guiding elements" or of "multiple reflections from a specularly-reflective surface." Additionally, the Patent acknowledges that in Miyazaki "the incident radiation undergoes multiple reflections inside both the sample and reference cells." However, the Miyazaki system still uses a mechanical pump to direct gases through the chamber and is, therefore, distinguishable from the Patent. Finally, while Miyatake describes the internal surface of its sample cell to be a mirror surface, no reason is given for this characteristic.

As described in the Patent, the sole purpose for having a specularly-reflective surface within the chamber is the ability to move radiation down the length of the tube to the detector. The language of the claim references a surface for "transmitting radiation introduced at one end of said tube to the other end of said tube by means of multiple reflections from said specularly-reflective surface." The remaining language of the Patent consistently refers to a "specularly-reflective surface" as one that will transmit radiation down the length of the tube by means of multiple reflections.

Defendant contends that the appropriate definition of specularly reflective is the literal meaning of the word, which it argues is "mirror-like." In support of this definition, Defendant refers the court to extrinsic evidence, such as dictionaries. Additionally, Defendant relies on Wong's deposition in which he states that,

in layman terms, specularly-reflective means "mirror-like."

The only language in the Patent relied upon by Defendant is the statement that the sample chamber is to act like a "light pipe." Defendant then refers the court to extrinsic evidence for the definition of a "light pipe" which is defined as a "special kind of mirror." However, in the prosecution history of the Grandparent Application, the examiner rejected the claims that contained the phrase "mirror-like smoothness" indicating that the phrase was "indefinite." He questioned whether the phrase means "that the portion is a[s] smooth as a mirror or does it mean that the portion is somehow reflective to some degree." Based on this comment, the phrase "mirror-like smoothness" was deleted from the Grandparent Application.

The interpretation the examiner had for the phrase mirror-like smoothness would also support a finding that, even if the court adopted Defendant's argument, mirror-like does not mean perfect specular reflection. The examiner considered the term to mean either very smooth or having a degree of reflectivity. This is evidence that the common usage of the term "mirror-like" is compatible with an interpretation of the phrase "specularly-reflective" to mean a surface that is reflective to some degree.

The court finds that the language of the Patent and the prosecution history of the Patent clearly define the term "specularly-reflective surface" to be a surface that will transmit radiation down the length of the tube by means of multiple reflections from such surface. The court need not consider the extrinsic evidence offered by Defendant to reach this conclusion.

- Plurality of Apertures Arrayed Along

Defendant argues that the phrase "plurality of apertures arrayed along" as used in the Patent requires "multiple apertures placed in an order throughout the length of said tube," not just apertures located near the ends of the tube. Plaintiff contends that the phrase requires more than one aperture placed anywhere on the surface of the tube as opposed to the ends of the tube.

Again, the language of the Patent supports Plaintiff's construction. In the abstract, the Patent explains "a number of filtering apertures in the wall of the otherwise non-porous hollow tube permit the sample gas to enter and exit freely under ambient pressure." In the summary of the invention, the Patent refers to filtering apertures that "are included in the wall of the chamber." This language supports the more general definition offered by Plaintiff.

Defendant argues that the court should look to the drawings supporting the specification for help in determining the appropriate definition of the phrase. The drawing reveals a tube with four lines of evenly spaced apertures running down the length of the tube resulting in a total of 18 apertures. This is just one example of a tube that would comply with the phrase "a plurality of apertures arrayed along" a tube. Defendant itself has defined "plurality" as meaning "more than one" and certainly cannot argue that the drawing limits the Patent to devices with 18 apertures. Similarly, the argument that the drawing limits the Patent to products that contain a number of apertures arrayed in an orderly sequence throughout the tube conflicts with the description of the invention in other areas of the Patent. The court is cautioned both by case law, and by the Patent language itself,^{FN4} that the specifications may be considered in interpreting the language of the Patent but should not necessarily define the limitations of the Patent.

FN4. The Patent provides that:

It is to be expressly understood, however, that the drawings are for the purpose of illustration only and are

not intended as a definition of the limits of the invention.

Defendant also argues that the prosecution history supports their construction of the Patent language. The original claim 1 was an independent claim that required "at least one filtering aperture located intermediate the ends of said tube." The original claim 5 defined the "at least one filtering aperture" in claim 1 as "a plurality of apertures arrayed along said tube for improving the diffusion into the space within said tube."

The examiner rejected claim 1 as being unpatentable over Miyazaki in view of Fujimura. The examiner explained that Miyazaki teaches a chamber comprised of a tube with a reflective surface and an aperture. Fujimura teaches the use of a filter over the aperture. The examiner concluded that it "would have been obvious to utilize Fujimura's filter at Miyazaki's aperture because Fujimura teaches filter usage to prevent dust from entering a detection sampling tube ."

The examiner generally rejected claims 5 through 10 as being indefinite for failure to particularly identify the subject matter. The examiner also specifically rejected claim 5 as being unpatentable for the reasons given for claim 1 and over Miyazaki in view of Burough or Sukigara.FN5 The examiner reasoned that "it would have been obvious to utilize a plurality of apertures in Miyazaki because Burough's porous tube and Sukigara's filter tube suggest use of a plurality of apertures."

FN5. Sukigara was mentioned by the examiner in his consideration of the Application but was not mentioned in the Patent. The court was provided only with an untranslated copy of the Japanese patent of Sukigara. Accordingly, the court did not engage in an independent review of the invention described in Sukigara.

Wong responded to the examiners comments and distinguished Miyazaki and Fujimura as not suggesting the use of ambient pressure to move gas in and out of the sample chamber. Miyazaki used a motorized pump to bring air into the chamber via the inlet aperture and force air out of the chamber via the outlet aperture. Additionally, Wong argued that neither prior art patent taught the use of "at least one filtering aperture located intermediate the ends of said tube."

With regard to claim 5, Wong argued that:

Sukigara shows a hollow cylindrical dust filter, which presumably is porous. The space within this dust filter is the gas sample chamber.

As described above, Burough shows a gas sample chamber, the walls of which are porous.

The Examiner seems to be arguing that a wall having no apertures but composed of a porous material suggests a wall having apertures but composed of a nonporous material. This is saying that "no aperture" suggests "apertures, which is nonsense. The Examiner is surely aware that the microscopic passages in a material such as sintered metal are referred to as "pores", as in the patent of Burough, and that the much larger holes in the wall of the applicant's sample chamber would never be referred to as "pores", but instead are referred to as apertures.

Wong then resubmitted the patent with the same language FN6 in claim 1 of the proposed patent and minor revisions to the relevant language in dependent claim 5.FN7 The examiner again rejected claim 1 as obvious over Miyazaki and Fujimura. He recognized that claims 5 through 10 contained allowable subject matter but objected to them as written because there was no independent claim. In doing so, the examiner abandoned his prior objection to claim 5 as being obvious over Burough and Sukigara. Wong then converted claim 5 to a independent claim, which became Claim 1 of the Patent, upon which the remaining claims depended. These claims were allowed.

FN6. "Said tube including at least one filtering aperture located intermediate the ends of said tube."

FN7. "The sample chamber of Claim 1 wherein said at least one filtering aperture is a plurality of apertures arrayed along said tube for improving the diffusion into and out of the space with said tube, each of said plurality of apertures covered by said sheet of a semipermeable membrane."

Defendant states that the examiner asserted that "Miyazaki showed 'at least one aperture located intermediate the ends of the tube' as stated in claim 1." Defendant then argues that the examiners' acceptance of claim 5, which references a plurality of apertures, does not include the two port arrangement of Miyazaki. Defendant has not indicated where in the record the examiner indicates that Miyazaki shows "at least one aperture" and the court has not found such language in the examiner's materials. In fact, the examiner indicated that Miyazaki had one aperture and reasoned that "it would have been obvious to utilize a plurality of apertures in Miyazaki because Burough's porous tube and Sukigara's filter tube suggest use of a plurality of apertures." This language makes it clear that the examiner did not view Miyazaki as an example of a chamber utilizing a plurality of apertures and that a sample chamber with two apertures located somewhere along the surface of the sample chamber falls within the Patent.

Finally, Defendant contends that the term "plurality of apertures arrayed along" was not included in the original application and may not be interpreted to introduce new matter or expand the application of the Patent. Defendant argues that the current language of "one or more filtering apertures are included in the wall of chamber" improperly broaden the meaning of the original phrase "an aperture is included in the wall of the chamber" and is impermissible.

The claims offered in the original application provided:

1. A sample chamber for conducting radiation through a gas, comprising in combination:

an elongated hollow tube, composed of a gastight material, and having a inwardly-facing specularly-reflective surface that conducts radiation introduced at one end of said elongated hollow tube to the other end with high efficiency by means of multiple reflections from said inwardly-facing specularly-reflective surface, portions of said elongated hollow tube defining at least one aperture located intermediate the ends of said elongated hollow tube;

a sheet of a semipermeable membrane spanning said at least one aperture, said sheet permitting airborne particles smaller than 0.1 micron to diffuse through it into the space within said elongated hollow tube and preventing airborne particles larger than 0.1 micron from entering said space.

2. The sample chamber of Claim 1 further comprising in combination: means for heating said specularly-reflective surface to a temperature above the dew point of the gas to prevent condensation on said specularly-reflective surface.

The original abstract related "a number of apertures in the wall of the elongated hollow tube [to] permit the gas to enter and exit." The original summary of the invention described the sample chamber as having an aperture in the wall of the chamber. The original specification provides that "the elongated hollow tube includes at least one aperture, of which the aperture is typical. These apertures serve to permit ambient gases to enter and leave the sample chamber." The drawings supporting the specification are identical to those in the Patent and show a tube with 18 apertures located at equal distances along all four sides of the sample chamber.

Section 132 of the Act provides that "[N]o amendment shall introduce new matter into the disclosure of the invention." The Federal Circuit states that:

The fundamental inquiry is whether the material added by amendment was inherently contained in the original application. To make this judgment, this court has explained that the new matter prohibition is closely related to the adequate disclosure requirements. Section 112, in turn, requires: "a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art ... to make and use the same." Thus, to avoid the new matter prohibition, an applicant must show that its original application supports the amended matter.

Schering Corp. v. Amgen, 222 F.3d 1347, 1352 (Fed.Cir.2000) (citations omitted). However, the presumption of validity, which is based in part on the expertise of the patent examiner who is presumed to have done his job, still applies. *Brooktree Corp. v. Advanced Micro Devices, Inc.*, 977 F.2d 1555, 15745 (Fed.Cir.1993).

"This presumption, which may be viewed as a presumption of administrative correctness, as applied to a new matter determination was discussed by a our predecessor court, which stated that " 'the fact that the Patent Office allowed an amendment without objections thereto as new matter (within the meaning of Title 35 U.S.C. s. 132) is entitled to an especially weighty presumption of correctness.' "

Id. at 1574-75 (citations omitted).

Defendant first mentions that the original claim did not contain the adjective "filtering" in describing the aperture. This is correct. However, the original claim made it clear that a sheet of semipermeable membrane would span the aperture to allow smaller particles to diffuse through it into the sample chamber while preventing larger particles from entering the sample chamber. The original claim clearly describes an aperture which filters out undesirable material. The addition of the word "filtering" does not broaden the claim to any degree.

Next, Defendant argues that Plaintiff's construction relies on language in the Patent which provides that "one or more filtering apertures are included in the wall of the chamber" even though that language is not found in the original application. The comparable language of the original application reads "an aperture is included in the wall of the chamber." The only change in the Patent language was the possibility of having more than one aperture. It has nothing to do with the proper interpretation of the phrase "arrayed along." The original claim language and the specification provided for "at least one aperture" which clearly

contemplates more than one aperture. Additionally, the drawings supporting the specification show 18 apertures in the walls of the sample chamber. The addition of the language "one or more filtering apertures" does not broaden the meaning of any words in the original application.

The court rejects Defendant's restricted interpretation of the phrase "plurality of apertures arrayed along." The phrase, as used in the context of the Patent, is construed to mean a sample chamber with a minimum of two apertures located somewhere along the surface of the sample chamber.

- Semipermeable Membrane

Defendant asserts that the term "semipermeable membrane" is properly interpreted to mean "a thin, soft, pliable covering that is permeable to particles smaller than about 0.1 microns, and that is impermeable to smoke, water vapor, and particles larger than about 0.1 microns." Again, Plaintiff supports a more general definition of the term.

The specific claim language at issue does not designate the size of the particles to be excluded but rather describes the membrane as allowing gases to diffuse through it under ambient pressure while "preventing airborne particles larger than a predetermined size from entering said space." However, other language found in the Patent supports Defendant's restrictive interpretation.

In the abstract, the Patent indicates that "particles of smoke and dust of a size greater than 0.1 micron are kept out of the chamber by use of a semipermeable membrane that spans the apertures in the hollow tube." In distinguishing the invention from the prior art of Burough, the Patent explains that the porous material used in the chamber of Burough is several hundreds of microns thick, while "the diffusion into the sample chamber takes place through a semipermeable membrane which is on the order of 25 to 50 microns thick."

In the summary of the invention, the Patent explains that the first objective of the sample chamber is to serve as a light pipe "while keeping particles of smoke and dust that are larger than 0.1 microns out of the sample chamber." The summary continues:

A second objective of the diffusion type gas sample chamber is to restrict access of unwanted contaminants, by size, so that they will not cause error in the measurement of the concentration of a particular gas, while at the same time permitting molecules of particular gas to freely enter and leave the sample chamber by diffusion only, through one or more filtering apertures.

The summary goes on to state that the filtering apertures are each covered "by a layer of semipermeable membrane that keeps particles larger than 0.1 micron from entering the space within the chamber."

In the detailed description of the preferred embodiment, the Patent describes the diffusion of ambient gases into and out of the sample chamber through the filtering apertures covered by a semipermeable membrane.

However, it is not desirable that particles of dust and smoke should be able to enter the chamber freely, and, to that end, the filtering aperture is covered by a sheet of a semipermeable membrane that keeps out particles of a size greater than 0.1 micron. To achieve high rates of diffusion for particles of size less than 0.1 micron, the sheet of semipermeable membrane must be quite thin, and therefore it is supported on a support means having the form of a mesh-like grid that spans the filtering aperture.

The initial application for the Patent contained only two claims. The language of claim 1 in the original application described the semipermeable membrane as a "sheet permitting airborne particles smaller than 0.1 micron to diffuse through it into the space within said elongated tube and preventing airborne particles larger than 0.1 micron from entering said space." In a preliminary amendment to the application Patent filed within two months of the original application, Wong amended the language of the original two claims and added eight more claims. The language of the new claim 1 dropped the reference to the 0.1 micron and, instead, described the semipermeable membrane as one "permitting airborne particles smaller than a predetermined size to diffuse through it under ambient pressure into the space within said tube and preventing airborne particles larger than said predetermined size from entering said space." The 0.1 micron limitation was included in a claim 3 which read "the sample chamber of Claim 1 wherein said predetermined size is 0.1 micron."

The examiner rejected claim 3 as being unpatentable over Miyazaki in view of Fujimura explaining "it would have been obvious to utilize Fujimura's filter at Miyazaki aperture because Fujimura teaches filter usage to prevent dust from entering a detection sampling tube." The examiner additionally found Wong's invention unpatentable in view of Burough, and further in view of either Vennos or Anderson.FN8 The examiner stated "Fujimura's filter should have an order of magnitude of .3 microns as taught by Burough. Semipermeable membrane usage is known in sampling (Vennos, Anderson)."

FN8. Anderson was reference by the examiner in his consideration of the Application but was not disclosed in the Patent nor provided to the court. Consequently, the court has not engaged in an independent review of the invention described in Anderson.

In response, Wong differentiated his semipermeable membrane with the dust filter used in Fujimura, "which is used for presenting[sic] the entry of particles much larger than 0.1 micron, otherwise it would screen out the very particles that, by scattering the light, are essential for the operation of the instrument." Wong justified his position by pointing out that neither Miyazaki, which required some means for sucking or pushing gas through his sample chamber, or Fujimura, which relied on the motion of a motor vehicle to ram air into his sample chamber, was helpful in addressing the concern of keeping unwanted particles out while allowing the diffusion of gases into and out of the sample chamber through ambient pressure.

Wong addressed the second concern of the examiner by arguing that the references relied upon by the examiner were dissimilar to the invention at issue and would not be expected to provide any useful guidance in solving the problems of the present inventor. Wong summarized his problem as follows:

Whether gas would diffuse through the semipermeable membrane at a sufficient rate to permit fast response times and whether the semipermeable membrane could simultaneously keep dust and other unwanted particles out of his sample chamber.

With regard to Burough, Wong noted that Burough taught a nonporous sample chamber, which allowed the diffusion of gases into the sample chamber through the pores of the chamber whereas the invention at hand specifically utilized apertures to allow the entry and exit of gases from Wong's gastight, or nonporous, chamber. Wong argued that Vennos describes a fluid sampling device through which air is drawn by a pump and has no relevance to the diffusion-type gas chamber before the examiner. Finally, Wong explained that Anderson "described a control release system for volatile liquid insect attractant compositions that includes a container having an aperture closed by a membrane through which the insect attractant diffuses at a

desired rate."

Wong amended the language of claim 1 with regard to the semipermeable membrane to read more clearly but did not add the 0.1 micron limitation to the independent claim. Claim 3 remained the same with regard to the 0.1 micron limitation. The examiner again rejected both claims based on his existing grounds. However, he allowed claims 5 through 10 as to subject matter provided Wong create an independent claim. As noted above, Wong then converted claim 5 to a independent claim, which became Claim 1 of the Patent, upon which the remaining claims depended. These claims were allowed and are the claims presently before the court.

Defendant admits that Claim 1 does not have the 0.1 micron limitation. However, Defendant argues that the original claim 1 did have the limitation; that in the amendment to the application, Wong represented that the "ten claims as presently submitted cover applicant's invention in the customary range of scopes, with no broadening of scope beyond the claims as originally filed;" and that this court must continue to read Claim 1 as though it contained the 0.1 micron limitation in light of Wong's representation and existing case law.

Every reference to the semipermeable membrane found in the original application, with the exception of a general reference in the specification, FN9 limits the size of the particles blocked by the membrane to "larger than 0.1 micron." As noted above, the language of the Patent also limits, to a great degree, the "larger than 0.1 micron limitation. Both make it clear that the reason for the semipermeable membrane is to keep particles of smoke and dust out of the sample chamber. Both also make it clear that the size of these undesirable particles is 0.1 micron.

FN9. "Dust and smoke particles are kept out of the sample chamber by a sheet of semipermeable membrane that spans apertures that extend through the tubular wall of the sample chamber."

The prosecution history of the Patent supports a size limitation on the semipermeable membrane as well. The examiner considered the combination of Fujimura and Burough to teach the use of a filter to deflect particles that were larger than 0.3 microns. Wong responded by arguing that the dust filter of Fujimura was used to screen out particles "much larger than 0.1 microns." However, Wong did not address the relevant teaching of Burough, which he acknowledged in the original application, taught a pore size as small as 0.3 microns. This failure to respond to the examiner's statement implies a concession by Wong that the purpose of his semipermeable membrane is to keep particles of a size ranging from 0.1 to 0.3 from entering the sample chamber. FN10

FN10. The claim at issue, which allowed a single aperture in the wall of the chambers was finally rejected in light of the teachings of Miyazaki.

The problem is that Claim 1 does not contain the 0.1 micron limitation even though the supporting language in the Patent and the prosecution history clearly limits the membrane to 0.1 micron. And, as noted by Defendant, the original claim itself contained the 0.1 micron limitation. If the court were to interpret Claim 1 to allow semipermeable membranes that allowed particles greater than 0.1 microns into the sample chamber, the court would allow new matter to broaden the original claim, which is clearly prohibited. The court finds that the incontrovertible evidence that the original claim 1 contained the 0.1 micron limitation adequately overcomes the presumption of correctness afforded the examiner's issuance of the Patent and that

Claim 1 is limited to semipermeable membranes which deflect particles larger than 0.1 micron.

Plaintiff offers the testimony of its expert, Harry R. Manbeck, Jr., former Commissioner of the Patent and Trademark Office, to support its claim that "the alleged new matter is not, in fact, new matter." A careful review of Manbeck's expert report establishes that Manbeck is of the opinion that the majority of the items asserted to be new matter by Defendant are, in fact, not new matter. However, on the issue of the semipermeable membrane, Manbeck states that with regard to the screens and semipermeable membrane covering the apertures, "the critical pore size, and silicone rubber as the material, are disclosed." It appears from this representation that Manbeck reads the Patent to contain a pore size limitation and, consequently, did not address Plaintiff's contention that the pore size of the semipermeable membrane is not limited.

Finally, Plaintiff argues that the imposition of a 0.1 micron limitation is inappropriate under the doctrine of claim differentiation. As described by the Federal Circuit, the doctrine of claim differentiation:

which is ultimately based on the common sense notion that different words or phrases used in separate claims are presumed to indicate that the claims have different meanings and scope, normally means that limitations stated in dependent claims are not to be read into the independent claim from which they depend.

Karlin Technology, Inc. v. Surgical Dynamics, Inc., 177 F.3d 968, 971-2 (Fed.Cir.1999) (citation omitted). This doctrine is particularly applicable in situations where a claim element stated in general terms is asserted to be limited to a numerical range in the specification where the same numerical range appears in a dependent claim. Modine Manufacturing Co. v. United States International Trade Commission, 75 F.3d 1545, 1551 (Fed.Cir.1996). This doctrine, however, creates merely a presumption that may be overcome with clear and persuasive evidence. *Id.* Also, the doctrine may not be used "to broaden claims beyond their correct scope, determined in light of the specification and the prosecution history and any relevant evidence." *Multiform Desiccants, Inc. v. Medzam, Ltd.*, 133 F.3d 1473, 1480 (Fed.Cir.1998).

Application of the doctrine of claim differentiation in this instance would prohibit a limitation of the semipermeable membrane pore size to 0.1 micron in light of Claim 4, which reads "[T]he sample chamber of claim 3 wherein said predetermined size is 0.1 micron." However, the court's review of the existing language of the Patent and the prosecution history compels a different conclusion. The court finds that clear and persuasive evidence exists to overcome the presumption.

The interpretation offered by Plaintiff, that the semipermeable membrane is used to keep particles of a "predetermined size" out of the sample chambers, must be limited both by the language of the original application and the prosecution history of the Patent. This limits the pore size of the semipermeable membrane described in Claim 1 to a size that would prevent particles of smoke and dust of a size greater than 0.1 micron from entering the sample chamber.

Defendant raises an additional limitation to the semipermeable membrane described in Claim 1 based on the thickness of the membrane. Defendant contends that the Patent restricts the semipermeable membrane to a thickness "on the order of 25 to 50 microns."

The Patent itself distinguishes the invention from Burough by contrasting "the semipermeable membrane which is on the order of 25 to 50 microns thick" from the porous material used in the sample chamber of Burough which is "several hundreds of micron thick." Additionally, in the specification, the Patent explains:

To achieve high rates of diffusion for particles of size less than 0.1 micron, the sheet of semipermeable membrane must be quite thin, and therefore it is supported on a support means having the form of a mesh-like grid that spans the filtering aperture.

Finally, the common definition of the term "membrane" is a "thin, soft, pliable sheet or layer serving as a covering." The court finds that the language of the Patent and the prosecution history, supported by the common definition of the term, requires a finding that the semipermeable membrane described in Claim 1 is properly described as a thin, soft, pliable membrane with a thickness on the order of 25 to 50 microns thick.

-Elongated Hollow Tube

In its reply brief, Defendant contends that the term "elongated hollow tube" must be construed to require a "length at least seven to ten times the width of the tube." Defendant argues that the only description of the tube is found in the drawing, which shows a tube with a 10 to 1 length to width ratio. It also refers to the "elongated hollow tube" of Burough, which shows a chamber with a 7 to 10 width to length ration. There is no other support for Defendant's argument in the Patent or the prosecution history. The experts disagree on whether the term has a special meaning within the industry and what that special meaning might be. The common definition for the term elongated, as provided the American Heritage College Dictionary, 3d ed. (1997) is "having more width than length ." In the absence of clear evidence supporting a different meaning for the term elongated, the court finds that an elongated tube is a tube that it longer than it is wide.

-Multiple Reflections

Also in its reply brief, Defendant contends that the term "multiple reflections" apparently requires three or more reflections, based on the drawing supporting the specifications. The court considers the drawing to be merely an illustration of the path of single ray moving down the length of the tube and not the required path for all rays. However, the court must give some value to the adjective "multiple" with regard to its modification of the term "reflection." The court finds that the term multiple reflections requires that a ray reflect off the wall of sample chamber more than once before it reaches the end of the tube.

Patent Infringement

Now that the court has determined the proper construction for the disputed terms in the claims, the court must compare the alleged infringing products against each element of the claims to determine whether the products infringe. Plaintiff alleged in its complaint that the M310 chamber infringes upon the claims of the Patent. It appears from the pleadings currently before the court that Plaintiff contends that Defendant's Model 301A ("M301A") infringes as well. The court will consider both products in the following infringement analysis.

The M310 chamber has three gas port configurations. One is referred to as the "sample draw" style in which gas is fed into the chamber through an intake aperture. Plaintiff concedes the sample draw chambers are not diffusion style chambers and, therefore, do not infringe on the Patent.

The remaining two M310 chambers, which are admittedly diffusion style chambers, have four apertures drilled into the wall of the chambers. Two of the apertures are located at nearly equal distances from the end of the chamber on one side of the chamber with the remaining two located in the opposite side in similar positions. In the first M310 chambers, one of the apertures is blocked with a plastic plug while the aperture

in the other side and at the other end of the tube is covered with a calibration nipple, which allows for the tuning of the monitor at a later date. The two remaining holes are covered with a vent tape manufactured by the 3M company (the "Vent Tape"). The final M310 chamber has the calibration nipple but not the plastic plug and the remaining three apertures are covered with the Vent Tape.

In the M301A chamber, only one end of the chamber is open. A chamber is blind bored into a solid aluminum billet, then etched and chromated. The light source is inserted through a hole in the side of the chamber rather than introduced through at the open end of the tube. The M301A chamber has four apertures to allow the entry and exit of gas, two of which are located near the detector at one end of the chamber and the other two located near the side-inserted light source. The M301A uses only two of these apertures, which are covered by a thick "slip-on 80-pores-per-inch sponge filter element".

-Radiation Introduced at One End of Said Tube

Claim 1 of the Patent requires that the radiation source be introduced at one end of the sample chamber. The radiation source in the M301A is introduced through a hole in the side of the chamber near the end of the chamber, not at one end of the tube. The M301A clearly does not infringe on the Patent.

-Specular Reflection

Defendant contends that the M310 chamber does not have a specularly reflective surface on its inner walls. Defendant explains that the chambers are purposefully manufactured by an extrusion method to have a roughened, light-diffusive surface rather than a "mirror-like" surface. The court has rejected Defendant's contention that a specularly-reflected surface must have a "mirror-like" or highly polished surface. Accordingly, the fact that the interior walls of the chamber are not highly polished is irrelevant. The appropriate question is whether the interior chamber of Defendant's product assists in the transmission of the radiation to the opposite end of the tube by means of multiple reflections.

Defendant asserts that "the M310 sample chamber simply does not rely on a specularly-reflective surface to transmit radiation by means of multiple specular reflections." In support of this, Defendant offers an experiment performed by its president, Michael Mueller, in which Mueller directed a collimated laser beam through an M310 sample chamber to a small screen about 18 inches away. The collimated laser beam scattered as it made its way through the sample chamber and lit up a large area of the small screen. Mueller compared this to a collimated laser beam that was reflected off a set of specular reflectors, which resulted in a pin point of light landing of the small screen.

Plaintiff's expert, Dr. Kouznetsov, performed a "Black Paint Test" as well as a "Gold Plating Test" on the M310 and Defendant's Model CD-A. The chambers were similar except that the Model CD-A had a metal coating on its internal walls. Dr. Kouznetsov confirmed this by testing the output signal of both chambers by introducing an infrared radiation source into the chambers on one side and measuring the amount of the radiation reaching the other end of the chambers. The untreated M310 had an output signal of approximately 390 mV and the untreated Model CD-A had an output signal between 250 and 300 mV.

Dr. Kouznetsov performed the Black Paint Test on the M310 chamber by painting the internal walls of the M310 chamber with black paint. The black paint effectively absorbs rather than reflects radiation. The signal output of the M310 chamber with the black paint was approximately 130 mV, clearly less than the signal output of the untreated chamber, which establishes that a large portion of the signal output of the untreated chamber traveled through the chamber through reflections off the wall of the chamber.

Dr. Kouznetsov then performed the Gold Plating Test on the Model CD-A by plating the inside walls of the chamber with gold, which is known to enhance the infrared reflectivity of a given surface. The signal output of the gold-plated chamber was virtually the same as the signal output for the untreated chamber, which reveals that the untreated chamber was highly reflective of infrared radiation.

Plaintiff's second expert, William M. Worek, Ph.D., also performed a test on the M310 chamber to determine whether the chamber was "specularly reflective." Dr. Worek defined a specularly reflective surface as one which would generally reflect radiation at the same angle as the incident radiation. Dr. Worek then used a Helium-Neon laser, which produced visible light, to direct a beam at a known angle at the surface of the chamber and measured the amount of radiation reflected from the chamber wall at an equal angle. The test revealed a ratio of reflectivity ranges from 100% to 65% between incident angles of 90 to 77 degrees. Dr. Worek stated that this range illustrates that the surface of the chamber is specular. Dr. Worek also explained that the wavelength of infrared light has a wavelength seven to ten times longer than that of visible light and, accordingly, the chamber walls would be even more "specular" with respect to infrared light.

Both sides argue that the tests results of the opposing experts are flawed. Plaintiff argues that Mueller's test does not take into account the longer wavelength of infrared radiation. In any event, Plaintiff argues that Mueller's test establishes that the M310 chamber has sufficient non-diffuse reflectivity to transmit even visible light from one end of the chamber to the other. On the other hand, Defendant argues that Dr. Worek's test is incomplete, because he did not limit his measurements of radiation reaching the detector to the energy reflected at a specular angle. Additionally, Defendant argues that Dr. Worek's test proves that multiple specular reflections within the M310 chamber would not provide enough radiation intensity to result in a meaningful reading from the detector. With regard to Dr. Kouznetsov's tests, Defendant does not dispute that the result establish that the interior of is chambers are specularly reflective. However, Defendant argues that this finding is irrelevant because it does not establish that the radiation reaches the detector by means specular reflection or otherwise. Defendant also implies that Dr. Kouznetsov, who is an employee of Plaintiff and receives bonuses based on the performance of the company, is prejudiced in favor of his employer and is not a credible witness.

Based on the evidence before the court, the court finds that Plaintiff has established a genuine issue of material fact with regard to whether Defendant's alleged infringing chamber is "specularly reflective" as that term has been construed by the court. This issue must be presented to the ultimate factfinder for determination.

-Plurality of Apertures Arrayed Along

The court has construed the Patent term "plurality of apertures arrayed along" to mean "a minimum of two apertures located somewhere along the surface of the sample chamber." The M310 clearly meets the limitation of this term as interpreted by the court.

-Semipermeable Membrane

The court adopted Defendant's construction of the term "semipermeable membrane" which is a "thin, soft, pliable covering [about 25 to 50 microns thick] that lets particles less than 0.1 micron in size through, but excludes particles greater than 0.1 micron in size, including smoke and dust." The Vent Tape used by Defendant on the M310 is an adhesive-backed non-woven synthetic fabric. The maker of the Vent Tape

does not recommend the Vent Tape as a filtering device and will not guarantee that it will filter out particles of any particular size. Defendant uses the Vent Tape to keep out spiders and insects and large particles of debris, such as pieces of drywall.

Based on Defendant's measurements, the holes in the Vent Tape range from 50 to 250 microns wide. Even in the absence of any test results, it is clear to the court that the Vent Tape would not filter out articles less than 0.1 micron in size. The same conclusion is required with regard to the more general limitation that the semipermeable membrane prevent smoke and dust from getting into the sample chamber based on the fact that tobacco smoke particles range in size from .01 to 1.0 microns and that all particulates that require filtering, including pollen, coal dust and fly ash, are less than 100 microns.

These conclusions are supported by tests performed by Mueller and Defendant's expert Arnold M. Schafer, Ph. D. Mueller tested the Vent Tape to determine whether it was able to filter out smoke. Mueller placed a lit cigarette under Vent Tape that was covering an opening into a jar. With the help of a vacuum, smoke from the cigarette was drawn into the jar through the Vent Tape. Schafer performed a similar test using standard zirconia test particles, which ranged in size from 0.2 to 3.0 microns. Schafer covered a tube with Vent Tape. He then placed PTFE filter, which removes all particles greater than 0.2 micron, between the tube and the plastic tubing, which was connected to a small low pressure vacuum set at about 0.9 atmospheres. Schafer placed the zirconia particles on the vent tape and activated the vacuum. The majority of the zirconia particles were transmitted through the Vent Tape into the interior of the tube and onto the PTFE filter. About one-third of the zirconia particles remained on the Vent Tape. These tests establish unequivocally that the Vent Tape allows particles greater than 0.1 micron to pass through and therefore, does not effectively filter out all particles greater than 0.1 micron.

Plaintiff objects to the use of the vacuums in the test arguing that the Patent is limited to diffusion-type chambers. The court acknowledges that the tests do not duplicate the use of the filters in a diffusion-type atmosphere. However, the relative minor amount of force imposed on the ambient air by the vacuums minimizes the variance between the existing tests and tests duplicating the movement of gases into a diffusion-type chamber. Additionally, the claim limitation in the Patent has been interpreted to require a filter that "excludes particles greater than 0.1 micron in size, including smoke and dust" regardless of whether the movement of the particles is by diffusion or otherwise. The Vent Tape clearly allows particles greater than 0.1 micron in size to pass through the Vent Tape into the sample chamber.

Plaintiff also offers a test performed by Dr. Kouznetsov to establish that the Vent Tape prevents dust from entering into the sample chamber. The test was based on the UL dust requirements designed for smoke sensors but was modified to provide for more severe conditions in the test chamber. An M310 was placed in an enclosed chamber with cement dust and a fan. The fan was activated to create a little dust hurricane in the chamber and around the sensor. After 15 minutes, the M310 was removed. Analog output voltages were recorded before and after the dust testing. The output voltages remained virtually unchanged which, according to Dr. Kouznetsov, established that the Vent Tape provided excellent protection against know particles entering the chamber.

Dr. Kouznetsov's test is flawed. Dr. Kouznetsov never opened up the M310 to look inside and confirm that dust particles had entered the chamber. He merely relied on the virtually unchanged output voltages to support his opinion that no dust particles entered the chamber. However, Defendant contends that dust particles do not affect the performance of their products which is why it is not necessary for them to filter out the dust particles. Accordingly, even if dust particles entered the M310, the output voltages would be

expected to remain unchanged. It is unclear whether Dr. Kouznetsov's test merely confirmed that dust particles do not effect the M310 performance or whether dust particles were filtered out by the Vent Tape in the M310.

The court finds that the Vent Tape used by Defendant on the M310 is not a semi-permeable membrane as that term has been construed by the court. A finding of infringement requires that all elements of the claim be infringed by the alleged infringing device. Consequently, the court finds that Defendant's product does not literally infringe on Claim 1 of the Patent. As the remaining claims all depend on Claim 1, this finding applies to all claims of the Patent.

Doctrine of Equivalents

Plaintiff asserts that even if the M310 does not literally infringe on the Patent, it still infringes under the doctrine of equivalents. A patent is infringed under the doctrine of equivalents if the accused device performs substantially the same function in substantially the same way to achieve substantially the same result as the claimed invention. *Insta-Foam Products v. Universal Foam Systems*, 906 F.2d 698, 702 (Fed.Cir.1990). Infringement under the doctrine of equivalents is not precluded merely because the accused device performs functions in addition to those performed by the claimed device. *Insta-Foam Products*, 906 F.2d at 702. The doctrine of equivalents does not apply if a claim limitation is totally missing from the accused device, and thus cannot be met equivalently. *Pennwalt Corp. v. Durand-Wayland, Inc.*, 833 F.2d 931, 939 (Fed.Cir.1987), *cert. denied*, 485 U.S. 961, 108 S.Ct. 1226, 99 L.Ed.2d 426 (1988).

The doctrine of equivalents also does not apply if there is a prosecution history estoppel. This doctrine prevents a patentee from asserting equivalents that would "resurrect" subject matter given up during prosecution to overcome rejections based on prior art. *Hi-Life Products, Inc. v. American National Water-Mattress, Corp.*, 842 F.2d 323, 325 (Fed.Cir.1988). "When the doctrine 'is invoked, a close examination must be made as to, not only what was surrendered, but also the reason for such a surrender.'" *Id.* (citation omitted). Because amendments to claims serve different functions, all amendments do not operate as an estoppel to finding infringement under the doctrine of equivalents. *Id.* An objective standard of what a "competitor reasonably would conclude from the patent's prosecution history" is used to determine whether particular subject matter was relinquished. *Mark I Marketing Corp. v. Donnelley & Sons Co.*, 66 F.3d 285, 291 (Fed.Cir.1995), *cert. denied*, 516 U.S. 1115, 116 S.Ct. 917, 133 L.Ed.2d 847 (1996). The application of prosecution history estoppel is a question of law for the court. *Id.*

The court has found the presence of a genuine issue of material fact on the "specularly-reflective surface" claim element and has found that the M310 infringes on the "plurality of apertures arrayed along" claim element. The only claim element which might be effected by the doctrine of equivalents is that which limits the semi-permeable membrane to a size that will filter out 0.1 micron particles. Accordingly, the court will limit its application of the doctrine of equivalents to this claim alone.

Plaintiff offers the affidavit of Dr. Kouznetsov to support its reliance on the doctrine of equivalents. With regard to the semipermeable membrane claim element, Dr. Kouznetsov opines as follows:

Finally, the membrane covering the apertures in DCS' chambers that I have examined would also be equivalent to the filtering membranes in the '332 patent. As described in the '332 patent, the function of the membranes is to prevent unwanted contaminants from entering the chamber. It achieves this function by physically covering the holes with a material that allows gases to diffuse into and out of chamber, thereby

preventing contaminants from disrupting the sensor's ability to function as it was intended. The DCS filters are equivalent: (1) they keep out unwanted contaminants such as dust * * *; (2) they prevent contaminants from entering the chamber by acting as a physical barrier covering the apertures; and (3) they allow the sensor to perform as it was intended by not allowing contaminants to disrupt the sensor readings.

Dr. Wong stated that the reliability of his invention required a virtually particle-free environment to ensure that the specular reflection of the interior walls remained uncontaminated. Additionally, Dr. Wong testified that if a 0.5 micron particle made its way into his chamber, the results would be disastrous.

The reliability of the M310 is not primarily based on the specular reflectivity of the inner walls of its chambers. Accordingly, the introduction of relatively large particles, from 0.2 up to 5.0 microns, into the M310 chamber does not affect the performance of the sensor. The Vent Tape used on the M310, which is intended to keep out insects or large particles that might block the apertures or the chamber, does not serve the same purpose as the semipermeable membrane, which is intended to keep out minuscule particles which might mar the specularly-reflective surface of the inner walls. The court finds that Vent Tape is not equivalent, either in purpose or performance, to the semipermeable membrane described in the Patent.

Defendant argues that Plaintiff is barred from relying on the doctrine of equivalents by the Patent's prosecution history. However, because the court finds that the M310 does not infringe on the Patent under the doctrine of equivalents, the court will not address this argument.

CONCLUSION

Defendant's motion (19) for summary judgment should be GRANTED. The court finds that the M310 does not have a semipermeable membrane as described in the Patent and, therefore, does not infringe, either literally or by equivalents, on Claim 1 of the Patent. Defendant's motion (91) to submit a surrebuttal brief should be GRANTED and Defendant's motion (91) to strike the second and third affidavit of Dr. Kouznetsov should be DENIED. All remaining motions, including Defendant's motion (37) for partial summary judgment of invalidity; Plaintiff's motion (81) for summary judgment on validity and enforceability and Defendant's cross-motion (96) for summary judgment on validity and enforceability, should be DENIED as moot.

D.Or.,2002.

Edwards Systems Technology, Inc. v. Digital Control Systems, Inc.

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