IN THE UNITED STATES DISTRICT COURT

FOR THE WESTERN DISTRICT OF WISCONSIN

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WATSON INDUSTRIES, INC.,

Plaintiff,

v.

MURATA ELECTRONICS NORTH AMERICA, INC. and MURATA MANUFACTURING CO., LTD.,

Defendants.

OPINION AND ORDER

02-C-0524-C

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In this civil action for declaratory, injunctive and monetary relief, plaintiff Watson Industries, Inc. contends that nine different products of defendants Murata Electronics North America, Inc. and Murata Manufacturing Co., Ltd. infringe claims 43, 44, 47, 51, 52 and 67 in U.S. Patent No. 5,430,342, which relates to a vibration gyroscope. Plaintiffs bring their claim of infringement under 35 U.S.C. § 271. Jurisdiction is present. 28 U.S.C. §§ 1331 and 1338.

Conventional gyroscopes are rigid bodies or wheels that spin around an axis of rotation mounted in a movable frame that permits the spinning wheel to tilt freely in any direction and rotate about any axis. Their purpose is to provide angular rate information. 8 Wiley Encyclopedia of Electrical and Electronics Engineering at 545 (John Wiley & Sons, Inc. 1999). Vibration gyroscopes look nothing like the conventional gyroscope. They use a vibrating element to measure rotational velocity by employing the Coriolis principle, id., that a body moving relative to a rotating frame of reference is accelerated in that frame in a direction perpendicular both to its direction of motion and to the axis of rotation of the frame. They are far less expensive to produce than conventional gyroscopes and can be made in sizes small enough to fit inside global positioning systems and other small electronic products.

Following a hearing on August 29, 2003, I construed definitions for the following disputed terms in the '342 patent (1) "base electrode," (2) "inner conductive layer," (3) "angular rate sensor system," (4) "disposed on," (5) "being suspended proximate to the pair of natural acoustic nodes," (6) "signal processing circuit discriminating the angular rate from the sensing signals," and (7) "electrically connected."

Presently before the court are the parties' cross motions for summary judgment. Plaintiff contends that (1) models of Murata Gyrostar® sensors, ENC-03J, EMC-03L, ENC-03M, ENV-05F and ENV-05, and variations thereof, infringe claims 43, 44, 47, 51 and 67 of the '342 patent; (2) claims 44, 47, 51 and 52 of the '342 patent are not invalid; and (3) the '342 patent is enforceable. Defendants contend that because none of their accused products has a base electrode, as defined by the court, their products do not infringe the '342 patent, either literally or under the doctrine of equivalents. Because defendants' accused products do not transfer electric charge, I conclude that they do not have a base electrode and do not infringe the '342 patent. Therefore, I will deny plaintiff's motion for summary judgment and grant defendants' motion for summary judgment. Because I find noninfringement as a matter of law, it is unnecessary to consider the issues of invalidity and unenforceability of the '342 patent.

From the parties' proposed findings of fact and the record, I find the following facts to be undisputed.

UNDISPUTED FACTS

A. The Parties

Plaintiff Watson Industries, Inc. is the assignee of U.S. Patent No. 5,430,342, entitled "Single Bar Type Vibrating Element Angular Rate Sensor System." Defendant Murata Electronics North America, Inc. is a wholly owned subsidiary of defendant Murata Manufacturing Company, Ltd.

B. The '342 Patent

The '342 patent contains 74 claims, six of which are in dispute. Disputed claims 43 and 67 of the '342 patent are independent claims; disputed claims 44, 47, 51 and 52 are dependent claims. Claim 44 depends on claim 43; claims 47, 51 and 52 depend on claim 44.

Claim 43 of the '342 patent reads:

> 43. An angular rate sensor system which may be used with a signal processing circuit to discriminate an angular rate, the angular rate sensor system comprising:
>
> a vibratory sensing element including a base electrode, at least two layers of piezoelectric material each disposed on opposing sides of the base electrode, a first outer electrode disposed on a first side of the vibratory sensing element, and a second outer electrode disposed on a second side of the vibratory sensing element opposing the first side, the first outer electrode and the second outer electrode being oriented generally parallel with a plane, the vibratory sensing element defining a pair of acoustic nodes when vibrated in a direction of vibration oriented generally perpendicular to the plane, the vibratory sensing element being suspended proximate to the pair of natural acoustic nodes, said system further comprising:
>
> a third outer electrode, the third outer electrode being disposed on the second side of the vibratory sensing element, whereby the vibratory sensing element vibrates in the direction of vibration oriented generally perpendicular to the plane when either the first electrode or the second electrode are excited by a drive signal, and further whereby the first electrode or the second electrode produce sensing signals responsive and proportional to the angular rate of the vibratory sensing element, the signal processing circuit discriminating the angular rate from the sensing signals.

Claim 44 of the '342 patent reads:

44. The angular rate sensor system of claim 43 wherein the signal processing circuit includes a first operational amplifier and a second operational amplifier, each of the first operational amplifier and the second operational amplifier having an inverting input, a non-inverting input, and an output, and wherein the second outer electrode and the third outer electrode are electrically connected to the inverting input of the first operational amplifier, and wherein the second outer electrode is electrically connected to the inverting input of the second operational amplifier, and the third outer electrode is electrically connected to the non-inverting input of the second operational amplifier.

Claim 47 of the '342 patent reads:

47. The angular rate sensor system of claim 44 wherein the output of the first operational amplifier is electrically connected to the first electrode.

Claim 51 of the '342 patent reads:

51. The angular rate sensor system of claim 44 wherein the signal processing circuit includes a negative feedback loop electrically connected between the output of the first operational amplifier and the inverting input of the first operational amplifier.

Claim 52 of the '342 patent reads:

52. The angular rate sensor system of claim 44 wherein the signal processing circuit includes a negative feedback loop electrically connected between the output of the second operational amplifier and the inverting input of the second operational amplifier.

Claim 67 of the '342 patent reads:

67. An angular rate sensor system which may be used with a signal processing circuit to discriminate an angular rate, the angular rate sensor system comprising:

a vibratory sensing element including a base electrode, at least two layers of piezoelectric material each disposed on opposing sides of the base electrode, a first outer electrode disposed on a first side of the vibratory sensing element, and a second outer electrode disposed on a second side of the vibratory sensing element opposing the first side, the first outer electrode and the second outer electrode being oriented generally parallel with a plane, the vibratory sensing element defining a pair of acoustic nodes when vibrated in a direction of vibration oriented generally perpendicular to the plane, the vibratory sensing element being suspended proximate to the pair of natural acoustic nodes,

whereby the vibratory sensing element vibrates in the direction of vibration oriented generally perpendicular to the plane when either the first electrode or the second electrode are excited by a drive signal, and further whereby the first electrode or the second electrode produce sensing signals responsive and proportional to the angular rate of the vibratory sensing element, the signal processing circuit discriminating the angular rate from the sensing signals;

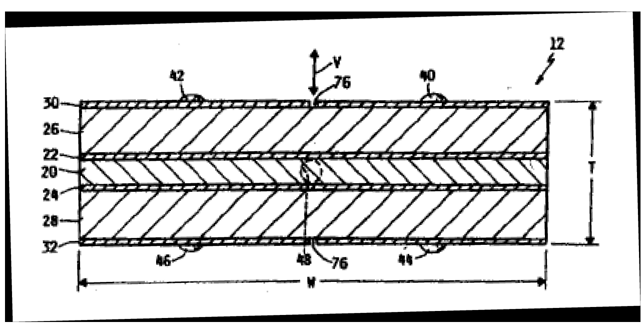
wherein the vibratory sensing [el]ement has a first acoustic node and a second acoustic node spaced apart from the first acoustic node, the angular rate sensor system further comprising:

a mounting structure, the mounting structure being attached to the vibratory sensing element proximate to each of the first acoustic node and the second acoustic node, the vibratory sensing element being suspended on the mounting structure so as to vibrate in the direction of vibration, wherein the mounting structure comprises:

a frame member defining an opening within which the vibratory sensing element is received, the opening having a first edge and a second edge; a first

> pair of filaments; and
>
> a second pair of filaments, each of the first pair of filaments and the second pair of filaments being connected to and extending from the first edge to the second edge and receiving the vibratory sensing element there between, the first pair of filaments being generally aligned along and parallel with the first acoustic node, the second pair of filaments being generally aligned along and parallel with the second acoustic node.

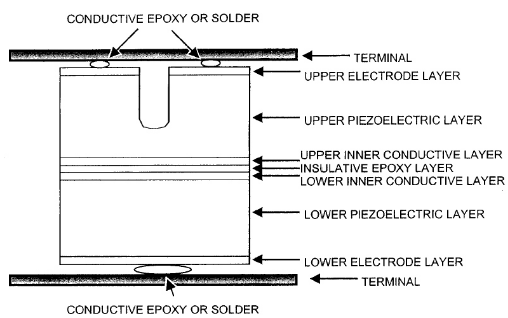
Although only claims 43 and 67 include the term "base electrode," the other disputed claims are dependent on claim 43 of the '342 patent. In an order issued on September 29, 2003, I construed "base electrode" to mean "a conductor through which an electric charge is transferred and that is located between at least two layers of piezoelectric material." Below is one diagram (Figure 2) of the vibratory sensing element as shown in the '342 patent:



C. Accused Products

1. Description

Each of defendants' accused products consists of a rectangular outer housing and, inside the housing, signal processing circuitry and a multi-layer rectangular prismatic "bar," typically referred to as a bimorph. The bimorph ranges from 1 to 2 centimeters long and is about one millimeter in thickness. Other than a few minor variations among models, the bimorphs of the accused products have an identical structure, composition and manufacturing process. The following diagram illustrates the various layers of the biomorph of the accused products (not to scale):



(The parties dispute whether the "inner conductive layers" label is accurate, whether the inner conductive layers are planar and whether those two inner layers touch. These disputes do not affect the final result of this case. In general, the parties agree that the diagram is accurate. To be consistent, I will adopt the term "inner metallic layers," which is used by plaintiff's expert to describe the metallic layers in the middle of the diagram above.)

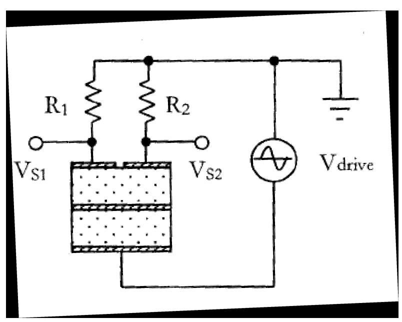
The accused products are two-layer series bimorphs, which require only electrical connections to the outer electrodes. (A two-layer parallel biomorph requires an electrical connection to a center electrode.) The upper and lower electrode layers are electrically connected to the signal processing circuit by terminals. The piezoelectric layers are made from lead-zirconate-titanate, commonly referred to as "PZT." PZT is a dielectric, which is a type of electrical insulator. An electrical insulator is a device having high electrical resistance and used for supporting or separating conductors to prevent undesired flow of current from them to other objects. The PZT accounts for most of the thickness in the bimorph bar.

2. Manufacturing process

There are four basic steps to fabrication of the accused bimorphs: (1) poling; (2) adhering; (3) dicing; and (4) terminal connection. After these steps are completed, the bimorph and the signal processing circuitry are mounted in the housing and the product is finished. The poling step coats the top and bottom surfaces of the PZT (but not the edges) with metal and applies a relatively large voltage for approximately 30 minutes. The metallic layers that were applied for the purpose of poling remain on the PZT plates. The PZT plates are adhered together using an insulative epoxy. The upper metallic layer of the PZT plate is eventually used again as the upper electrode layer of the bimorph and the lower metallic layer of the PZT plate is eventually used again as the lower electrode layer in the bimorph.

3. Performance

After defendants' bimorph is completed, terminals are applied to the outer electrode layers. The terminals serve to secure the bimorph within the housing and serve as a connection point between the bimorph and the signal processing circuit. Connecting the outer electrode layers to the signal processing circuit induces vibration in the bimorph and allows the bimorph to receive signals relating to the change in angular rate. The diagram below indicates the general manner in which the bimorph is used in a circuit.



A driving signal using an alternating current is applied between the upper and lower electrodes to place the bimorph into vibration. (The McGraw Hill Dictionary of Scientific & Technical Terms (6th ed. 2003) defines "alternating current" as "electric current that reverses direction periodically, usually many times per second.") Sensing of the angular rate in the bimorph is accomplished by sensing the voltage of the two subdivided electrodes. The signal processing circuitry uses the two sensing signals and the driving signal to determine an angular rate.

The accused bimorphs resemble a series of capacitors. Capacitors consist of an insulator bounded by two adjacent conductors. (The McGraw Hill Dictionary of Scientific & Technical Terms (6th ed. 2003) defines "capacitor" as "a device which consists essentially of two conductors (such as parallel metal plates) insulated from each other by a dielectric and which introduces capacitance into a circuit, stores electrical energy, blocks the flow of direct current, and permits the flow of alternating current to a degree dependent on the capacitor's capacitance and the current frequency.")

Plaintiff's expert, Robert E. Carter, provided technical information about the accused products and conducted experiments on the accused products. These experiments included a light-emitting diode (LED) experiment and an impedance sweep.

D. Alternating Current and Capacitors

According to Douglas C. Giancoli, Physics, 557 (3d ed. 1991), if a capacitor is connected to an alternating current, the current will flow continuously. This happens because charge begins to flow when the alternating current voltage is first turned on, so that one conductive plate acquires a negative charge and the other a positive charge. Id. When the voltage reverses itself, the charges flow in the opposite direction. Id.

Furthermore, David E. Johnson, et al., Basic Electric Circuit Analysis, 144 (5th ed. 1995), states that because of the dielectric, charges cannot move from one conducting body to the other within a capacitor. Therefore, the charges must be transported between the conducting bodies via external circuitry connected to the terminals of the capacitor. Id.

According to the McGraw Hill Dictionary of Scientific & Technical Terms (6th ed. 2003), "induced current" is a "current produced in a conductor by a time-varying magnetic field, as in induction heating." Furthermore, "temperature" is a measure of the *average* kinetic energy of individual molecules. Giancoli, Physics, at 372. Higher kinetic energy translates to higher temperatures. Id. "Heat is energy that is transferred from one body to another because of a difference in temperature." Id. at 371. Heat is not a substance. Id. "Kinetic energy" is "the energy which a body possesses because of its motion." McGraw Hill Dictionary of Scientific & Technical Terms (6th ed. 2003).

OPINION

To prevail on a motion for summary judgment, the moving party must show that even when all inferences are drawn in the light most favorable to the non-moving party, there is no genuine issue of material fact and that the moving party is entitled to judgment as a matter of law. Fed. R. Civ. P. 56(c); Anderson v. Liberty Lobby, Inc., 477 U.S. 242, 250 (1986); McGann v. Northeast Illinois Regional Commuter Railroad Corp., 8 F.3d 1174, 1178 (7th Cir. 1993). "Defeating summary judgment requires more than a swearing match," In re Wade, 969 F.2d 241, 245 (7th Cir. 1992); the opposing party must set forth specific facts showing that there is a genuine issue for trial. Fed. R. Civ. P. 56(e); Matsushita Electric Indus. Co. v. Zenith Radio Corp., 475 U.S. 574, 586 (1986). However, summary judgment may be awarded against the non-moving party only if the court concludes that a reasonable jury could not find for that party. Hayden v. La-Z-Boy Chair Co., 9 F.3d 617, 618 (7th Cir. 1993).

Determination of patent infringement is a two-step process in which the court must first construe the meaning of the patent's claims and then compare the properly construed claims to the allegedly infringing device. Markman v. Westview Instruments, Inc., 52 F.3d 967, 976 (Fed. Cir. 1995) (en banc), aff'd, 517 U.S. 370 (1996). A device infringes a patent claim if it contains every limitation set forth in that claim, either literally or by equivalence. See Johnson Worldwide Assocs. v. Zebco Corp., 175 F.3d 985, 988 (Fed. Cir. 1999). "A patent is infringed if any claim is infringed." Pall Corp. v. Micron Separations, Inc., 66 F.3d 1211, 1220 (Fed. Cir. 1995).

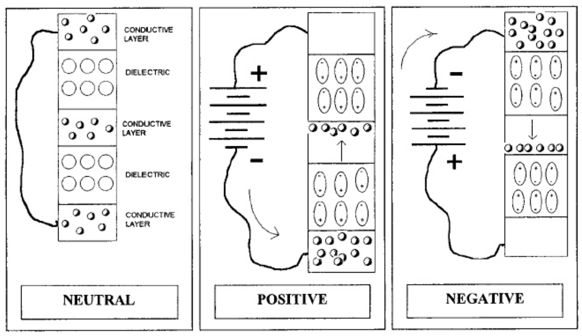
A. Literal Infringement

"To establish literal infringement, every limitation set forth in a claim must be found in an accused product, exactly." Southwall Technologies, Inc. v. Cardinal IG Co., 54 F.3d 1570, 1575 (Fed. Cir. 1995); see also Allen Engineering Corp. v. Bartell Industries, Inc., 299 F.3d 1336, 1345 (Fed Cir. 2002) ("Literal infringement of a claim exists when each of the claim limitations 'reads on,' or in other words is found in, the accused device.").

A threshold question in this case is whether the "inner metallic layers" in defendants' accused products fit within the definition of "base electrode." Because "base electrode" is a limitation on all the disputed claims, a finding that the accused products contain a base electrode would lead to a finding of infringement of all disputed claims. In the September 29, 2003, opinion and order, I construed "base electrode" to mean "a conductor through which an electric charge is transferred and that is located between at least two layers of piezoelectric material." The parties do not dispute that the inner metallic layers are "conductors that are between at least two layers of piezoelectric material. The dispute centers on whether the inner metallic layers transfer electric charge.

It is undisputed that the inner metallic layers in the accused products are two-layer series bimorphs, which require electrical connections to only the outer electrodes, not to the inner metallic layers. Because the inner metallic layers are not electrically connected to the external circuit, electrical charge will not transfer out of the inner metallic layers into the external circuit. Plaintiff notes that none of the disputed claims in the '342 patent require the base electrode to be connected to any external portion of the device. Although this is true, the definition of base electrode requires that transfer of electric charge occur. Because the inner metallic layers are surrounded by insulative PZT, the laws of physics do not permit the transfer of the electric charge from the inner metallic layers of the accused products into the dielectric. If the inner metallic layers in the accused products do not transfer charge either through the dielectric or through an external source, how does the transfer occur? The crux of plaintiff's argument is that the inner metallic layers of the accused products transfer charge because the electrons within those layers move back and forth *within the physical boundaries* of those layers when one applies an alternating current, as occurs in the accused products. According to plaintiff, this back and forth motion qualifies as a "transfer" of electric charge.

To support this argument, plaintiff refers to the findings of its expert, Robert E. Carter. Carter stated that the inner metallic layers in the accused products are electrically in series with both outer electrodes and the two PZT layers. Decl. of Robert E. Carter, dkt. # 151, at 6. As a result, when one applies alternating current, the inner metallic layers are under the influence of the electric fields established within the capacitive layered structure of the accused product. Id. The alternating current causes the electrons in the inner metallic layers to move under the influence of these constantly alternating fields back and forth within the physical boundaries of the inner metallic layers. Id. Below is a diagram, offered by Carter, that demonstrates this movement:

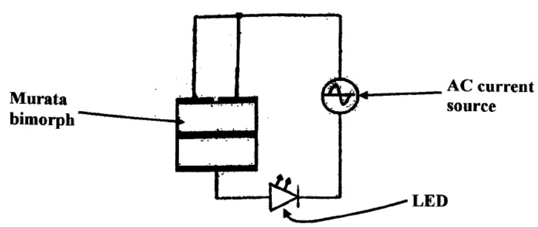


Decl. Of Robert E. Carter, dkt. #151, exh. 1, at 6. According to the Oxford English Dictionary Online, "transfer" means to "convey or take from one place, person, etc. to another; to transmit, transport; to give or hand over from one to another." Thus, for transfer of electric charge to occur, the charge must travel from one place to another. The Oxford English Dictionary Online defines "place" as "a particular part of space, of defined or undefined extent, but of definite situation." Webster's New World College Dictionary 1099 (4th ed. 2001), defines "place" as "the part of space occupied by a person or thing." One could argue that the inner metallic layers have different "places" within them, but plaintiff never makes this argument directly. Carter states that the electrons in the inner metallic layers remain within the physical boundaries of those layers, suggesting that the inner metallic layers constitute one physical place. I find that thinking of "place" as a space physically outside the boundaries of another space fits best with the construction of the term base electrode. In the September 29, 2003, opinion and order, I noted that the IEEE Standard Dictionary of Electrical and Electronics Terms (IEEE Std 100-1992) defined "electrode" as an "electric conductor for the transfer of charge *between the external circuit and the electroactive species in the electrolyte.*" (Emphasis added). I noted also that The Illustrated Dictionary of Electronics (7th ed. 1997) defines electrode as "a body, point or terminal in a device or *circuit that delivers electricity*, or to which electricity is applied." (Emphasis added). These definitions of "electrode" support a definition of "transfer" that means carrying or delivering a charge to a place outside the conductor. If the electric charges move within the same place only, transfer does not occur.

Furthermore, in the September 29, 2003 opinion and order, I modified the definition of "base electrode" with the word "through." Electric charge must be transferred *through* the conductor to qualify as a "base electrode." Plaintiff attempts to modify the word "transfer" with the word "within." I do not view the words "through" and "within" to be synonymous. The Oxford English Dictionary Online defines "through" (in reference to travel or conveyance) as "along the whole distance; all the way; to the end of the journey; to the destination." Webster's New World College Dictionary 1493 (4th ed. 2001), defines "through" as "in one side and *out the other side of*; from end to end of." (Emphasis added). The Oxford English Dictionary Online defines "within" as "in the inner part or interior, or on the inner side (of a receptacle or other material thing); inside, internally." Webster's New World College Dictionary 1644 (4th ed. 2001), defines "within" as "in or into the interior; on the inside; internally." Carter argues that the electric charge transfers through the entire length of the inner metallic layers, as well as through the thickness of the layers. Even if I accept as true plaintiff's argument that the electrons transverse the entire length of the inner metallic layers, this movement fails to qualify as a transfer, as used in the definition of base electrode, because the electrons are still within the physical boundaries of the inner metallic layers.

Plaintiff makes several more arguments to support its position that the inner metallic layers transfer electric charge. First, the inner metallic layers are not completely separated and touch in at least one place. Hence, charge transfers between the two layers. I understand plaintiff to assert that movement between the two layers qualifies as a transfer because the charges move from one physical layer to another. However, plaintiff argues also that inner metallic layers that touch "functionally result in a single conductive layer between the two layers of piezoelectric." Plt.'s Br., dkt. #148, at 11. Accepting plaintiff's argument as true, movement of electrons between the two inner metallic layers would not qualify as a transfer of electric charge because the two layers would function as a single layer. Therefore, the electrons would still be within the physical boundaries of the inner metallic layer.

Plaintiff contends that Carter's LED experiment demonstrates that the inner metallic layers transfer electric charge. The LED experiment consisted of wiring a single LED ("light-emitting diode") in series with an accused bimorph. Decl. of Robert E. Carter, dkt. #135, at 13. Carter hypothesized that if the LED lights, then charge must be transferred by the inner metallic layers. Id. at 14. Carter's experiment is shown in the diagram below:



When Carter applied voltage to the circuit, the LED emitted light. Id. at 15. When Carter removed the bimorph from the circuit (leaving all other electrical leads in the demonstration in their original position), the LED went dark. Carter concluded that the demonstration showed that 25,000 times per second some amount of current flows into the accused product and then back out again. Id.

It is undisputed that charge does not pass through the dielectric in a capacitor. Rather, when a capacitor's outer electrodes are electrically connected to an external circuit running alternating current, charge is collecting on the outer electrodes and then moving in the opposite direction when the voltage reverses itself. This would cause an LED hooked into the circuit to emit light. Carter admits as much, stating that the LED experiment did "not show that any charge transferred completely through the entire bimorph, only that charge can be transferred into and out of the two end terminals of the bimorph." Decl. of Robert E. Carter, dkt. #135, at 15. Carter stated also that "[n]o one believes that electrons or other carriers move through the dielectric layer of the capacitor." Decl. of Robert E. Carter, dkt. #151, at 4.

These statements by plaintiff's expert undermine plaintiff's contention that the impedance sweep experiment shows the transfer of electric charge through the accused product. Carter stated that the impedance sweep "cannot be done without passing current through the sensing element, therefore the [inner metallic layer] (which is electrically in series with all other electrodes and the two piezoceramic layers) must transfer the charge which makes up this current." Decl. of Robert E. Carter, dkt. #119, at 9. According to Carter, the impedance sweep confirmed the proposition that the accused products had piezoelectric material, passed alternating current, identified the frequency region of actual operation and identified the magnitude of electrical impedance of the bimorph. Id. at 9, 15, 23-24, 30 and 38; Decl. of Robert E. Carter, dkt. #151, at 4-5. Plaintiff offers nothing more than a conclusory statement that the impedance sweep demonstrates transfer of electric charge. Plaintiff fails to show how these results, particularly the passing of alternating current, raise a dispute about the ability of the inner metallic layers of the accused products to transfer electric charge. Because alternating current cannot physically pass through the dielectric in the accused bimorph, a reasonable jury could not believe that the impedance sweep shows that current passes *through* the bimorph, thereby transferring electric charge.

Despite admitting that charge cannot transfer completely through the bimorph, plaintiff argues that "induced current" causes the movement of electric charge in the inner metallic layers when one applies alternating current to the outer electrodes. Therefore, the electrons do not need to cross the dielectric from the outer electrodes to the inner electrodes in order to initiate electron movement. Plt.'s Br., dkt. #148, at 4, n. 4. Carter states that the movement of the electrons is "induced" by the action of electric fields. Decl. of Robert E. Carter, dkt. #151, at 8. He asserts that "the fact that this charge did not come from outside the electrodes does not contraindicate true current flow, nor any of its attendant physical effects such as power dissipation, temperature rise, etc." Id. He explains that the inner metallic layers will exhibit resistive heating. Id. Even if I accept as true plaintiff's argument that induced current causes the electrons to move within the physical boundaries of the inner metallic layers, plaintiff fails to show for example that a rise in temperature translates into transfer of electric charge to a place outside the physical boundaries of the inner metallic layers. Electron movement creates kinetic energy. Kinetic energy causes the rise in temperature and resulting heat. Heat may flow into the atmosphere outside the inner metallic layers when one applies alternating current to the accused bimorph. However, unlike electrons, heat is not a substance. Therefore, heat emanating from the inner metallic layers does not lead to the conclusion that the layers transfer electric charge.

Plaintiff contends that a transfer of electric charge occurs in the inner metallic layers because there is a decreased efficiency of the accused products when one removes the inner metallic layers. Plaintiff's expert determined that removing the inner metallic layers in the accused products would reduce the output of the products by 30%. Decl. of Robert E. Carter, dkt. # 151, at 13. However, Carter attributes this difference in efficiency to the *electron movement* within the inner metallic layers, which "evened out" the electric field in the layer of PZT close to the lower outer electrode of the accused device. Id. at 10-11.

This argument is a recharacterization of plaintiff's central argument that electron movement within the physical boundaries of the inner metallic layer qualifies as a "transfer." I have concluded that movement within the physical boundaries of the inner metallic layers is not a "transfer" within the meaning of "base electrode."

Because the electrons in the accused products' inner metallic layers do not leave the physical boundaries of those layers, I find as a matter of law that the inner metallic layers do not transfer electric charge. Therefore, the inner metallic layers do not qualify as a base electrode and do not literally infringe the '342 patent.

B. Infringement Under the Doctrine of Equivalents

Under the doctrine of equivalents, "a product or process that does not literally infringe upon the express terms of a patent claim may nonetheless be found to infringe if there is 'equivalence' between the elements of the accused product or process and the claimed elements of the patented invention." Warner-Jenkinson Co. v. Hilton Davis Chemicals Co., 520 U.S. 17, 21 (1997). The doctrine requires plaintiff to demonstrate more than a broad, overall equivalence between an accused product and a patented invention. Rather, "[e]ach element contained in a patent claim is deemed material to defining the scope of a patented invention, and thus the doctrine of equivalents must be applied to individual elements of the claim, not to the invention as a whole." Id. at 29. "An element in the accused product is equivalent to a claim limitation if the differences between the two are 'insubstantial' to one of ordinary skill in the art. Insubstantiality may be [established by showing that] the accused device 'performs substantially the same function in substantially the same way to obtain the same result' as the claim limitation." Catalina Marketing Int'l

v. Coolsavings.com, Inc., 289 F.3d 801, 812-13 (Fed. Cir. 2002) (citations omitted).

The doctrine of equivalents exists to insure fairness to both patent holders and competitors. Limiting the scope of a patent claim to its literal meaning could allow others to escape from liability for patent infringement on the most technical grounds. Because of language's inability to "capture the essence" of innovation, it is sometimes necessary to go beyond the literal meaning of a claim's terms to determine whether a patent has been infringed. Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., Ltd., 535 U.S. 722, 731-33 (2002). At the same time, the doctrine of equivalents is not to be applied so liberally that it traps competitors who believed reasonably that they were acting lawfully. Charles Greiner & Co., Inc. v. Mari-Med Manufacturing, Inc., 962 F.2d 1031 (Fed Cir. 1992) ("[C]areful confinement of the doctrine of equivalents to its proper equitable role . . . promotes certainty and clarity in determining the scope of patent rights.").

Plaintiff argues infringement under the doctrine of equivalents only because defendants raise the issue in their motion for summary judgment. Plaintiff makes the same argument for infringement under the doctrine as it did under the literal analysis. Specifically, plaintiff contends that because the inner metallic layers transfer electrical charge, the accused products perform the same function in the same way to achieve the same result. Because I have already determined that the inner metallic layers in the accused products do not transfer electric charge, I find no infringement under the doctrine of equivalents.

Plaintiff has failed to adduce evidence that defendants' accused products transfer electric charge and therefore include a base electrode. As a result, defendants do not infringe claims 43, 44, 47, 51, 52 and 67 of the '342 patent with their Gyrostar® gyroscope models ENC-03JA, ENC-03JB, ENC-03JC, ENC-03LA, ENC-03LB, ENC-03LC, ENC-03MB, ENV-05F and ENV-05G. Because I find no infringement, it is unnecessary to consider the remaining issues of invalidity and unenforceability of the '342 patent. See Phonometrics, Inc. v. Northern Telecom Inc., 133 F.3d 1459, 1468 (Fed. Cir. 1998) (district court has discretion to dismiss counterclaims of patent invalidity and unenforceability as moot where it finds no infringement). I will grant defendants' motion for summary judgment.

ORDER

IT IS ORDERED that

1. The motion for summary judgment filed by plaintiff Watson Industries, Inc. is DENIED;

2. The motion for summary judgment filed by defendants Murata Electronics North America, Inc. and Murata Manufacturing Co., Ltd. is GRANTED;

3. The clerk of court is directed to enter judgment in favor of defendant and close this case.

Entered this 17th day of December, 2003.

BY THE COURT:
BARBARA B. CRABB
District Judge