Paper No. _____

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

AVX CORPORATION
Petitioner
v.

GREATBATCH, LTD.
Patent Owner

Patent No. 7,327,553
Issue Date: February 5, 2008
Title: FEEDTHROUGH CAPACITOR FILTER ASSEMBLIES WITH LAMINAR FLOW DELAMINATIONS FOR HELIUM LEAK DETECTION

Inter Partes Review No. Unassigned

PETITION FOR *INTER PARTES* REVIEW UNDER 35 U.S.C. §§ 311-319 AND 37 C.F.R. § 42.100 *ET. SEQ.*

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EXHIBIT LIST

Ex. #	Exhibit
1001	U.S. Patent No. US 7,327,553 ("'553 Patent")
1002	Declaration of Dr. Pedro Irazoqui
1003	U.S. Patent No. 6,349,025 ("Fraley")
1004	U.S. Patent No. 6,765,780 ("Brendel")
1005	U.S. Patent No. 4,246,556 ("Snow")
1006	Image File Wrapper for '553 Patent
1007	Curriculum Vitae of Dr. Pedro Irazoqui
1008	THE AMERICAN HERITAGE COLLEGE DICTIONARY (4th ed. 2004)
1009	Plaintiff's Initial Brief on Claim Construction Issues Case 1:13-cv-00723-LPS
1010	Plaintiff's Answering Brief on Claim Construction Issues Case 1:13-cv-00723-LPS
1011	Opening Claim Construction Brief of Defendants AVX Corporation and AVX Filters Corporation Case 1:13-cv-00723-LPS
1012	Response Claim Construction Brief of Defendants AVX Corporation and AVX Filters Corporation Case 1:13-cv-00723-LPS

NOTICE OF LEAD AND BACKUP COUNSEL

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NOTICE OF EACH REAL-PARTY-IN-INTEREST

The real-parties-in-interest are AVX Corp. and AVX Filters Corp.

NOTICE OF RELATED MATTERS

The '553 patent is asserted in *Greatbatch LTD. v. AVX Corp. et al.*, Civil Action No. 1:13-cv-00723-LPS (D. Del).

NOTICE OF SERVICE INFORMATION

Please address all correspondence to the lead counsel at the address above. Petitioner consents to electronic service at: phunter@foley.com; nlagerwall@foley.com; and mhouston@foley.com.

GROUNDS FOR STANDING

Petitioner hereby **certifies** that the patent for which review is sought is available for *inter partes* review and that the Petitioner is not barred or estopped from requesting an *inter partes* review challenging the patent claims on the grounds identified in the Petition.

STATEMENT OF MATERIAL FACTS

The earliest potential effective filing date of the claims of the '553 patent is July 27, 2004. (*See*, Ex. 1001) U.S. Patent No. 6,349,025 ("Fraley," Ex. 1003) has an effective filing date of at least October 25, 2000 and was granted on February 19, 2002. Fraley is therefore prior art to the claims of the '553 patent under at least 35 U.S.C. § 102(b). U.S. Patent No. 6,765,780 ("Brendel," Ex. 1004) has an effective filing date of at least February 27, 2003 and published as U.S. 2003/0213605 on November 20, 2003. Brendel is therefore prior art to the claims of the '553 patent under at least 35 U.S.C. § 102(a). U.S. Patent No. 4,246,556 ("Snow," Ex. 1005) granted on January 20, 1981 and is prior art to the claims of the '553 patent under at least 35 U.S.C. § 102(b).

STATEMENT OF PRECISE RELIEF REQUESTED

Petitioner respectfully requests that the Board initiate an *inter partes* review and cancel Claims 1-20 of the '553 patent as unpatentable pursuant to 35 U.S.C. § 311(b) based on the 4 grounds of unpatentability that are discussed in detail herein (including relevant claim constructions).

THRESHOLD REQUIREMENT FOR *INTER PARTES* REVIEW

A petition for *inter partes* review must demonstrate "a reasonable likelihood that the petitioner would prevail with respect to at least one of the claims

challenged in the petition." (35 U.S.C. § 314(a).) The Petition meets this threshold. Each of the elements of Claims 1-20 of the '553 patent are taught in the prior art as explained below in the proposed grounds of unpatentability. Also, the reasons to combine references are established for each ground under 35 U.S.C. § 103(a).

STATEMENT OF REASONS FOR RELIEF REQUESTED

I. Introduction to the Technology of the '553 patent

The '553 patent is directed to a "feedthrough filter capacitor assembly . . . mounted to [a] hermetic terminal of an implantable medical device." (Abstract.) The feedthrough filter capacitors are designed to "incorporat[e] a hermetic seal to prevent passage or leakage of fluids through the filter assembly and facilitate post manufacture and pre-usage testing of the hermetic seal." (1:15-19.) In particular, the '553 patent purports to "facilitate helium leak detection" testing by providing a "washer [] disposed between [an] insulator and [a] capacitor body," "an adhesive layer disposed between the capacitor and the washer that laminates the washer to the capacitor," and "a laminar delamination gap for accommodating and facilitating post-manufactured hermetic seal testing." (Abstract; 3:55-60; 4:8-14.)

II. Prosecution History of the '553 Patent

The '553 patent was filed as U.S. Patent App. No. 11/161,198 (the "'198 application") on July 26, 2005. The '198 application claims priority to U.S. Provisional Patent Application No. 60/591,743 (the "'743 application"), filed on

July 27, 2004. There was one (1) Office Action issued by the United States Patent and Trademark Office (U.S. PTO) during prosecution of the '198 application. (Ex. 1006 at 31-37.) The Office Action was mailed on June 26, 2007 and included a 35 U.S.C. § 102(b) rejection of (then pending) Claims 1, 4-8, 10-13, 18, and 21-23, in view of U.S. Patent No. 6,566,978 to Stevenson et al. (Ex. 1006 at 32-35.) Notably, the Office Action rejected then pending Claim 1 and asserted that the Stevenson reference disclosed the claimed "laminar delamination gap" at Fig. 27. (Ex. 1006 at 33 and 34.) As discussed below, the Applicant for the '198 application did not dispute this assertion by the Examiner. (*See* Ex. 1006 at 26.) Rather, the Applicant acquiesced in the rejection and narrowed the rejected independent claims by incorporating subject matter that the Examiner identified as being allowable. (*See* Ex. 1006 at 20-26.)

Specifically, the Office Action objected to (then pending) Claims 2, 3, 9, 19, and 20 as being dependent upon a rejected base claim, but otherwise reciting allowable subject matter. (Ex. 1006 at 35 and 36.) In a response filed on September 26, 2007, the Applicant for the '198 application amended independent (then pending) Claims 1 and 18 to recite "an adhesive layer disposed between the capacitor and the washer," as previously presented in then pending dependent Claims 2, 9, and 19. (Ex. 1006 at 20-22 and 24-26.) Independent Claim 8 was similarly amended to include subject matter relating to the "adhesive layer."

Accordingly, after Applicant's amendments, all four (4) independent claims recited subject matter considered allowable by the Examiner relating to the "adhesive layer." (Ex. 1006 at 10-13.) The '553 patent was subsequently granted on February 5, 2008. (Ex. 1006 at 1.)

III. Independent Claim 1 of the '553 Patent

The feedthrough filter assembly of Claim 1 includes a "capacitor having first and second sets electrode plates," a "conductive ferrule conductively coupled to the second set of electrode plates," an "insulator at one axial side of capacitor, extending across and sealing an aperture in the ferrule," a "conductive terminal pin extending through the insulator and the capacitor in conductive relation with the first set of electrode plates," a "washer disposed between the insulator and the capacitor, wherein the insulator and the washer cooperatively define a laminar delamination gap," and an "adhesive layer disposed between the capacitor and the washer." (9:24-38.) As shown in Fig. 6, a feedthrough filter assembly includes a capacitor 60, a conductive ferrule 56, an insulator 52, a conductive terminal pin 72, a washer 54, and an adhesive layer 58. (5:60 – 6:l. 18; 7:51-8:21.) The feedthrough filter assembly further includes a "laminar delamination gap 62" in between the insulator 52 and the washer 54. (Fig. 7; 6:23-28.)

IV. Construction of the Claims

A claim in *inter partes* review is given the "broadest reasonable construction in light of the specification." (*See*, 37 C.F.R. § 42.100(b).) For the purposes of this proceeding, claim terms are presumed to take on their broadest reasonable ordinary meaning. As stated in the case *In re ICON Health and Fitness, Inc.* at 496 F.3d 1374, 1379 (Fed. Cir. 2007): "the PTO must give claims their broadest reasonable construction consistent with the specification. Therefore, we look to the specification to see if it provides a definition for claim terms, but otherwise apply a broad interpretation." In addition to this presumption, Petitioner provides a more detailed explanation of the broadest reasonable meaning of certain claim terms.

i. "Axial Side" (Claims 1, 7, 12, and 16)

Claims 1, 7, 12, and 16 each require "an insulator at one axial side of capacitor." Outside of the claims, the '553 patent makes only one mention of the term "axial side." Specifically, the '553 patent discloses that "[a]n insulator is adjacent to an axial side of the capacitor and extends across and seals an aperture in the ferrule." (4:4-6.) The specification, however, fails to define the term "axial side."

The capacitors disclosed in the '553 patent are discoidal or otherwise cylindrical in shape. (*See, e.g.*, reference numerals 16, 100, 60, and 60 of Figs. 1, 3, 5, and 8, respectively.) In addition, each of Figs. 6, 7, and 9 in the '553 patent illustrate the insulator (52) positioned relative to a side of the capacitor (60)

through which an axis of the discoidal (or cylindrical) capacitor would run. The axis can, for example, coincide with terminal pin 72 in Fig. 6. This is consistent with The American Heritage College Dictionary (4th ed. 2004), which defines "axial" as "[l]ocated on, around, or in the direction of an axis." (Ex. 1008 at 3.) Petitioner therefore submits that the broadest reasonable construction of the term "axial side" is a side of the capacitor along an axis of the capacitor.

ii. "Laminar Delamination Gap" (Claims 1, 7, 12, and 16)

The phrase "laminar delamination gap" appears in each of independent Claims 1, 7, 12, and 16 of the '553 patent. In Claims 1, 7, and 16, the phrase is used in the context of "a washer disposed between the insulator and the capacitor, wherein the insulator and the washer cooperatively define a laminar delamination gap." The Claim 12 recitation of "laminar delamination gap" is slightly different, as discussed below in section IV(iv). In particular, the discussion in section IV(iv) below notes that certain claim elements of Claim 12 appear to be mistakenly transposed such that the "laminar delamination gap" of Claim 12 should be construed the same as the "laminar delamination gap" of Claims 1, 7, and 16.

A "laminar delamination gap" is not defined in the specification, and one of skill in the art would not recognize a "laminar delamination gap" as a term of art. (Ex. 1002 at 16.) The '553 patent states that a "laminar delamination gap is provided between the capacitor sealing materials and the hermetic terminal

assembly to facilitate helium leak detection." (Abstract.) The '553 patent further states that "[i]t is an important feature of the present invention that the bottom surface of the non-adhesive washer 54 not be laminated to the top surface of the insulator 52 or the ferrule 56 of the terminal 50" and that "[t]his leaves a very thin laminar delamination gap 62 which is best seen in the exploded view of FIG. 7." (6:23-28.) The '553 patent goes on to state that "this small delamination gap 62 is sufficient to readily allow helium atoms to pass during a helium leak detection test" and that "if either or both braze joint … were defective, this would allow helium to penetrate through the defective braze … or a corresponding crack in the alumina insulator 52 into the laminar delamination gap 62 and out to the other side of ferrule 56 where it could be readily detected …." (6:32-39.)

Thus, the '553 patent indicates that the purpose of the "laminar delamination gap" is to facilitate a helium leak detection test. Patent Owner has affirmed this in the pending litigation involving the '553 patent. Specifically, Patent Owner has stated that the "purpose of the gap is to permit the passage of helium gas–often utilized in leak detection quality control analyses–to pass readily to the outside edges of the ceramic capictor [*sic*]." (Ex. 1009 at 43; emph. added.) The '553 patent additionally states that "helium . . . contained within the laminar delamination gap 62 can pass readily to the outside of the ceramic capacitor 60." (7:48-50; emph. added.) A dictionary definition of the word "lamina" is "[a] thin

plate, sheet, or layer" and the dictionary identifies "laminar" as an adjective form of "lamina." (Ex. 1008 at 4, THE AMERICAN HERITAGE COLLEGE DICTIONARY 777 (4th ed. 2004).) In the phrase "laminar delamination gap," the adjective "laminar" modifies the noun "gap." Accordingly, the broadest reasonable construction of "laminar delamination gap" is a layer of space between materials through which helium may pass to an outside edge of the capacitor.

Patent Owner may attempt to assert a narrower construction of the "laminar delamination gap." For example, Patent Owner has previously argued that a "laminar delamination gap" should be construed as a "very thin space between layers of material allowing passage of helium gas to the outer edges of the capacitor." (Ex. 1009 at 42.) However, importing additional limitations to the construction of "laminar delamination gap" would not be consistent with a broadest reasonable construction of the term. As noted above, a broadest reasonable construction of the term "laminar delamination gap" according to the specification of the '553 patent is a layer of space between materials through which helium may pass to an outside edge of the capacitor.

Further, the "laminar delamination gap" should not be limited by Patent Owner's additional terms (i.e., "very thin space between layers".) First, the specification of the '553 patent describes the "laminar delamination gap" with qualifiers referencing size. For example, the '553 patent discloses "a very thin

laminar delamination gap," a "small delamination gap," and a "thin and controllable delamination gap." (6:27-32; 7:18-23.) Accordingly, since the "laminar delamination gap" of the '553 patent is qualified by dimensional adjectives throughout the specification of the '553 patent, there is no dimension inherent in the claim term "laminar delamination gap." Indeed, the Patent Owner has acknowledged just that, stating that the "laminar delamination gap can be of any shape and size large enough to allow passage of helium atoms" (Ex. 1009 at 44; emph. added) and that "the delamination gap is not limited to a single enumerated size." (Ex. 1010 at 35; emph. added.) Patent Owner further argued that "laminar delamination gap" should not be interpreted to limit the shape or size of such a gap because it is "compelling" that Greatbatch never amended the '553 Patent to limit the gap to '50 Angstroms or so' to avoid prior art." (Ex. 1010 at 34.) Similarly, as discussed herein, the Patent Owner did not dispute an assertion by the Examiner during prosecution that the prior art discloses a "laminar delamination gap," nor did the Patent Owner argue that the term "laminar delamination gap" has an inherent size or shape limitation. (*See supra* section III and Ex. 1006 at 19-27.) Accordingly, by Patent Owner's own statements, the laminar delamination gap as recited in the '553 patent should not be construed to be limited to any particular shape or size, and Patent Owner's prior construction

that the "laminar delamination gap" be a "very thin space between layers of material" should not be adopted.

The Patent Owner has also previously argued that the "laminar delamination gap" construction should be a "space between layers of material." (Ex. 1009 at 42.) This previous construction by the Patent Owner should also not be adopted. First, the broadest reasonable interpretation in light of the specification of a "laminar delamination gap" does not imply that a "laminar delamination gap" is "between layers of material." As discussed above, "laminar delamination gap" is not a term of art to one of ordinary skill in the art, so intrinsic evidence in specification must be looked at to determine its meaning. (*See* Ex. 1002 at 16.) Nowhere in the '553 patent is there discussion of a "laminar delamination gap" being "between layers of material" as previously proposed by the Patent Owner. In making this claim construction, the Patent Owner appears to have argued that the claim term "laminar" implies "between layers of material." However, the term "laminar" modifies the claim term "gap" and as discussed above the terms lamina/laminar means a "thin plate, sheet, or layer." (Ex. 1008 at 4.) Accordingly, the claimed "laminar delamination gap" is properly construed as a layer of space between materials through which helium may pass to an edge of the capacitor.

Lastly, Petitioner acknowledges that, in the pending litigation, Petitioner argued for a narrower construction of the term "laminar delamination gap." (*See, e.g.*, Ex.

1011 at 41 and 42; Ex. 1012 at 34 and 35). However, such differences are permissible and reasonable given the different claim construction standards applied during an *inter partes* review and a civil patent litigation suit. A claim in *inter partes* review is given the "broadest reasonable construction in light of the specification." (*See,* 37 C.F.R. § 42.100(b).) In contrast, the narrower claim construction standard prescribed for civil litigation is that the "ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, *i.e*., as of the effective filing date of the patent application." (*Phillips v. AWH Corp.,*415 F.3d 1303, 1313, 75 USPQ2d 1321, 1326 (Fed. Cir. 2005) (*en banc*).) Furthermore, the Patent Trial and Appeal Board (PTAB) has itself acknowledged that "in *inter partes* review proceedings the Board applies the broadest reasonable interpretation consistent with the specification." (*Google, Inc. v. Whitserve LLC*, IPR2013-00249, Paper 32, slip op. 29 (PTAB September 9, 2014).) The Board also details that federal district courts "appl[y] the claim construction standard articulated in *Phillips*. (*Id.* at 28-29.) The Board finally stated "that 'different results' in the outcome of validity challenges 'in the two forums may be entirely reasonable.'" (*Id.* at 29, citation omitted.) The Board further explained how this may occur: "[u]nder the district court standard . . . considerations such as preservation of validity or the notice function of claims may lead to the adoption of

the narrower of two equally plausible constructions. . . . Our claim construction standard, however, does not take factors such as presumption of validity into account." (*Id.* at 29 and 30, citations omitted.) Accordingly, Petitioner's argument for a broader claim construction in the instant Petition is proper in light of the differing claim construction standards between an *inter partes* review and a patent litigation in federal district court.

For at least these reasons, Petitioner submits that the broadest reasonable construction of "laminar delamination gap" is a layer of space between materials through which helium may pass to an outside edge of the capacitor.

iii. "Insulator" (Claims 3, 8, 13, and 18)

Claims 1-20 of the '553 patent require an "insulator." Claim 1, for example, requires "an insulator at one axial side of capacitor." Claim 3, which depends from Claim 1, requires "a corresponding plurality of conductive terminal pins extending respectively through the insulator …." Claim 4, which depends from Claim 3, requires that "the insulator comprises a plurality of insulators."

Thus, the claims make clear that the "insulator" can be a plurality of insulators. In contrast, the insulator may also be a single insulator with multiple pins passing through it, as apparently illustrated in Fig. 2 of the '553 patent. Specifically, Fig. 2 appears to show multiple terminal pins 14 extending through a single insulator 36.

Accordingly, one of ordinary skill in the art would recognize that the broadest reasonable construction of the term "insulator" is one or more insulators.

iv. "A Washer Disposed Between the Insulator and the Capacitor, Wherein the Insulator and the Washer Cooperatively Define an Adhesive Layer, a Laminar Delamination Gap, Disposed Between the Capacitor and the Washer" (Claim 12)

The phrase "a washer disposed between the insulator and the capacitor, wherein the insulator and the washer cooperatively define an adhesive layer, a laminar delamination gap, disposed between the capacitor and the washer" appears in Claim 12 of the '553 patent. One of ordinary skill in the art would recognize that the phrases "an adhesive layer" and "a laminar delamination gap" have been erroneously transposed in Claim 12, rendering the claim inconsistent with the specification of the '553 patent.

Specifically, Claim 12 of the '553 patent recites that the washer and the insulator "cooperatively define an adhesive layer." This is in contrast to the specification and stated purpose of the '553 patent. For example, the '553 patent states that "[i]t is an important feature of the present invention that the bottom surface of the non-adhesive washer 54 not be laminated to the top surface of the insulator 52 . . . . This leaves a very thin laminar delamination gap 62." (6:23-26; emph. added.) Furthermore, there are no embodiments in the '553 patent that disclose a washer and insulator cooperatively defining an adhesive layer as

required by Claim 12. The '553 patent also does not disclose a single embodiment where "a laminar delamination gap [is] disposed between the capacitor and the washer," as required by Claim 12. Instead, the '553 patent discloses that an adhesive layer "laminate[s] both to the bottom of the ceramic capacitor 60 and to the top of the non-adhesive washer 54." (6:20-24.) Indeed, Claim 12 of the '553 patent itself goes on to recite that "the capacitor, adhesive layer and washer are laminated together."

Accordingly, the broadest reasonable construction of the aforementioned phrase from Claim 12 is a washer disposed between the insulator and the capacitor, wherein the insulator and the washer cooperatively define a laminar delamination gap, an adhesive layer disposed between the capacitor and the washer.

v. "Laminated together" (Claim 12)

The phrase "laminated together" appears in Claim 12, in the context that "the capacitor, adhesive layer and washer are laminated together." The specification does not define the term "laminated together." Rather, the '553 patent states that "an adhesive layer disposed between the capacitor and the washer [] laminates the washer to the capacitor following a curing process." (4:12-14.) The American Heritage College Dictionary (4th ed. 2004) defines "laminate" as to "make by uniting several layers." (Ex. 1008 at 4) Accordingly, it would be apparent to one of ordinary skill in the art that Claim 12 of the '553 patent indicates that a

capacitor, washer, and adhesive layer are all adhered together by adhesive. (Ex. 1002 at 21.) Thus, the broadest reasonable construction of the term "laminated together" is adhered together in layers.

vi. "The Adhesive Layer is Formed from a Liquid polymer, an Adhesive Washer, or a Thermal Plastic Adhesive Coated Material" (Claims 2, 7, and 17)

The phrase "the adhesive layer is formed from a liquid polymer, an adhesive washer, or a thermal plastic adhesive coated material" appears at least in Claims 2, 7, and 17. The words "formed from" define a process. Similarly, the word "liquid" defines a state of a polymer adhesive before it is cured and hardened. (*See* 6:11-13, 19, and 20; 8:40-43.) Thus, the adjective "liquid" in the claim term "liquid polymer" describes a state of a polymer adhesive in a state during the process of making the claimed feedthrough filter assemblies, and not the actual structure of the claimed feedthrough filter assemblies.

Since Claims 2, 7, and 17 are all directed toward an "EMI feedthrough filter assembly for use in an active implantable medical device (AIMD)," (i.e., an apparatus), any phrases or words in those claims that describe a process are product-by-process elements. (*See* MPEP § 2173.05(p).) In a patentability analysis of an apparatus, such product-by-process elements are not given patentable weight. Rather, only the structure resulting from the process is given patentable weight. (*See Greenliant Systems, Inc. v. Xicor LLC,* 692 F.3d 1261,

1265 (Fed. Cir. 2012) ("process limitations in product-by-process claims … cannot be used to distinguish prior art unless the process imparts structural differences to the product."); *In re Pilkington*, 411 F.2d 1345, 1348 (CCPA 1969) ("[P]atentability of a claim to a *product* does not rest merely on a difference in the method by which that product is made. Rather, it is the product itself which must be new and unobvious."); *In re Stephens*, 345 F.2d 1020, 1023 (CCPA 1965) ("We think it well settled that the presence of process limitations in product claims, which product does not otherwise patentably distinguish over the prior art, cannot impart patentability to that product.").)

Furthermore, "[b]ecause validity is determined based on the requirements of patentability, a patent is invalid if a product made by the process recited in a product-by-process claim is anticipated by or obvious from prior art products, even if those prior art products are made by different processes." (*Amgen Inc. v. F. Hoffman-La Roche Ltd.*, 580 F.3d 1340, 1370 n 14, 92 USPQ2d 1289, 1312, n 14 (Fed. Cir. 2009) (emph. added.) Accordingly, "[t]he Patent Office bears a lesser burden of proof in making out a case of prima facie obviousness for product-by-process claims because of their peculiar nature" than when a product is claimed in the conventional fashion. (*In re Fessmann*, 489 F.2d 742, 744, 180 USPQ 324, 326 (CCPA 1974); emph. added.)

The words "formed from" and "liquid" in Claims 2, 7, and 17 are not entitled to patentable weight because they merely describe the process by which an "adhesive layer" is formed. The terms "formed from" and "liquid" do not add structure to the claimed apparatus. The broadest reasonable construction of the phrase "the adhesive layer is formed from a liquid polymer, an adhesive washer, or a thermal plastic adhesive coated material" is the adhesive layer comprises a polymer, an adhesive washer, or a thermal plastic adhesive coated material.

vii. "The Washer is Formed from a Nonconductive Polyimide Sheet or a Thin Sheet of Alumina" (Claims 5, 10, and 20)

The phrase "the washer is formed from a nonconductive polyimide sheet or a thin sheet of alumina" appears at least in Claims 5, 10, and 20. The words "formed from" define a process. Similarly, the words "sheet" and "thin sheet" define the state and shape of a material from which the claimed washer is formed. (*See* 6:3-9.) Thus, the words "sheet" and "thin sheet" in the claims describe the state of a raw material used during the process of making the claimed washers, and not the actual structure of the claimed washers. Since Claims 5, 10, and 20 are all directed toward an "EMI feedthrough filter assembly for use in an active implantable medical device (AIMD)," (i.e., an apparatus), any phrases or words in those claims that describe a process are product-by-process elements.

As discussed in detail above (*see* section IV.vi), in a patentability analysis, such process elements are not given patent able weight. Rather, only the structure resulting from the process is given patentable weight. Accordingly, the terms "formed from," "sheet," and "thin sheet" do not deserve any patentable weight because they merely describe the process by which a "washer" is formed. The terms "formed from," "sheet," and "thin sheet" do not add structure to the apparatus. Accordingly, the broadest reasonable construction of the phrase "the washer is formed from a nonconductive polyimide sheet or a thin sheet of alumina" is the washer comprises a nonconductive polyimide or alumina.

V. Claim-By-Claim Explanation of Grounds for Unpatentability

Ground 1. Fraley anticipates Claims 1-20.

Claims 1-20 of the '553 patent are anticipated under 35 U.S.C. § 102(b) by U.S. Pat. 6,349,025 ("Fraley," Ex. 1003).

i. Independent Claims 1, 7, 12, and 16

Independent Claims 1, 7, 12, and 16 have several claim elements in common. In the discussion of the claims below, each common claim element is discussed only once, with a reference to the independent claims in which that claim element is found. Additional elements that are not common to all of the independent claims are addressed following the discussions of the common claim elements. Each of the limitations of Claims 1, 7, 12, and 16 are disclosed by Fraley as discussed in

detail below and as shown in the claim-by-claim chart in the expert declaration of Dr. Irazoqui in Ex. 1002. (*See* Ex. 1002 at 27-61.)

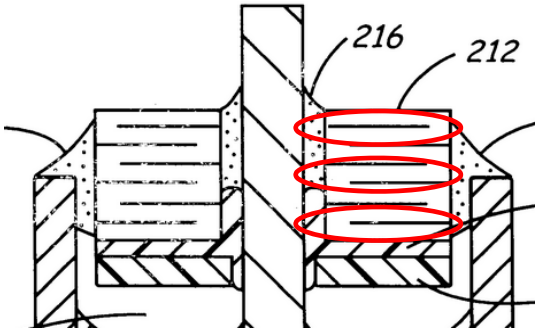
(1) Preamble of Claims 1, 7, 12, and 16

Claims 1, 7, and 12 are directed to an "EMI feedthrough filter assembly for use in an active implantable medical device (AIMD)." Claim 16 is directed to an "EMI feedthrough filter assembly for use in an electronic device (AIMD)." Fraley discloses a feedthrough filter assembly for use in an active implantable medical device. (Figs. 1-10; Ex. 1002 at 27, 53, 54, 56, and 57.) Fraley also discloses several embodiments of a "filtered feedthrough" "for use with implantable medical devices." (Abstract; 1:14; Ex. 1002 at 27, 53, 54, 56, and 57.)

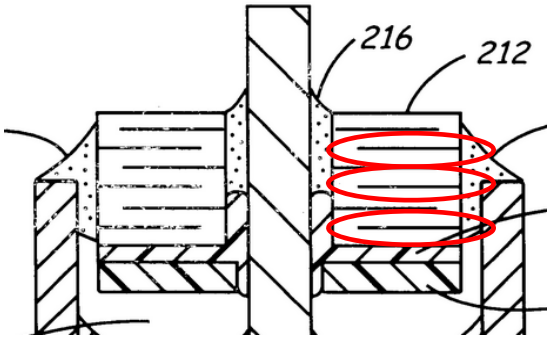
Regarding Claim 16, Fraley discloses the use of a feedthrough filter assembly in an electronic device. (Ex. 1002 at 60.) For example, Fraley discloses that "sensitive internal electronic components" can exist in an implantable medical device that utilizes feedthrough filters. (2:35-38; emph. added.) Fraley also discloses that a "filter feedthrough array of a further embodiment" may be "fitted into an opening of a housing of a hermetically sealed electronic device." (4:15-20; emph. added.) Accordingly, Fraley discloses an EMI feedthrough filter assembly used in an electronic device as recited by Claim 16. (Ex. 1002 at 60.)

(2) "capacitor having first and second sets of electrode plates" as recited in Claims 1, 7, 12, and 16

The claimed "feedthrough filter assembl[ies]" include "a capacitor having first and second sets electrode plates." Fraley discloses a capacitor (e.g., 212) having first and second sets of electrode plates. (Fig. 3; 7:48-8:14; Ex. 1002 at 27, 53, 54, 57, and 60.) Specifically, Fraley discloses that Fig. 3 includes "a discoidal capacitor 212." (7:52; Ex. 1002 at 28.) The "discoidal capacitor 212" in Fig. 3 includes a first set of electrode plates as circled below:



The "discoidal capacitor 212" in Fig. 3 also includes a second set of electrode plates as circled below:



A person of ordinary skill in the art would recognize that the horizontal lines shown in the "discoidal capacitor 212" in Fig. 3 of Fraley correspond to "first and

second sets of electrode plates" as claimed. (Ex. 1002 at 29.) Fraley further discloses that the "discoidal capacitor 212 correspond[s] generally to . . . [the] discoidal capacitor 112 of Fig. 1." (7:52-54.) Fig. 1 of Fraley does not actually include a reference numeral 112. Rather, Fig. 1 includes a "discoidal capacitor 12." However, even if Fraley mistakenly referred to Fig. 1 instead of Fig. 2, which includes a "discoidal capacitor 112," Fraley discloses that an interconnection of "the discoidal capacitor 112 . . . correspond[s] generally to the interconnection of the discoidal capacitor 12 . . . in Fig. 1." (7:6-9; Ex. 1002 at 29.) Accordingly, it would be apparent to one of ordinary skill in the art that the capacitor 212 of Fig. 3, the capacitor 12 of Fig. 1, and the capacitor 112 of Fig. 2 in Fraley are similar in that all the capacitors have first and second sets of electrode plates. (Ex. 1002 at 29.) Fig. 1 is shown below for convenience.

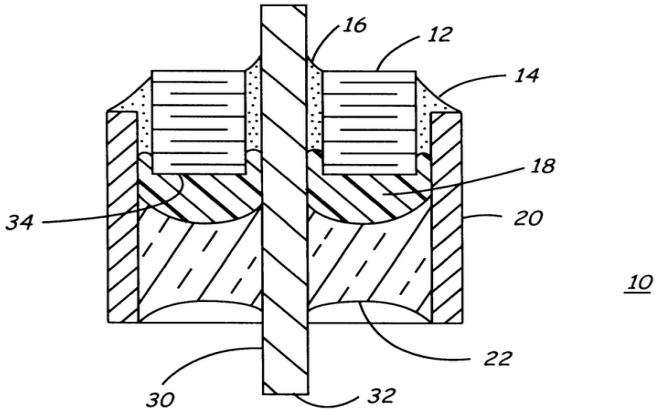


FIG. 1
PRIOR ART

With respect to the capacitor 12 shown in Fig. 1, Fraley discloses that "[t]he discoidal capacitor 12 is typically formed of a number of washer shaped layers or substrates of high dielectric barium titanate that are stacked together in a cylindrical, discoidal shape. Capacitor electrodes are deposited on the substrate surfaces in a first pattern that extends only to the outer edge of the washer shaped layer or in a second pattern that extends only to an inner through-hole or the substrate. The alternate patterned substrates are stacked together in the cylindrical shape to form overlapping, opposite polarity, capacitor electrodes." (4:52-61; emph. added.) It would be apparent to one of ordinary skill in the art that the "first pattern" and "second pattern" of "capacitor electrodes" in the "discoidal capacitor 12" in Fig. 1 of Fraley are "first and second sets electrode plates" of a "capacitor." (Ex. 1002 at 30.) As discussed above, the "discoidal capacitor 12" in Fig. 1 of Fraley corresponds generally to the "discoidal capacitor 212" of Fig. 3 of Fraley. Accordingly, Fig. 3 of Fraley also includes a capacitor (e.g., 12, 212) having first and second sets electrode plates. (Ex. 1002 at 30 and 31.)

Furthermore, "a capacitor having first and second sets electrode plates" as claimed is also disclosed in Fraley at least in Fig. 2 (e.g., 112), Fig. 7 (e.g., 312), Fig. 9 (e.g., 312), Fig. 10 (e.g. 412), and the accompanying descriptions of these figures. (Ex. 1002 at 31.)

(3) "the second set of electrode plates being grounded to the AIMD" as recited in Claims 7 and 12

Claims 7 and 12 further recite "the second set of electrode plates being grounded to the AIMD." It would be apparent to one of skill in the art, particularly in light of the discussion above with respect to the first and second sets of electrode plates of Fraley, that a "second set of electrode plates [of the capacitor may be] grounded to [an] AIMD," as claimed. (Ex. 1002 at 53 and 57.)

As an example, Fig. 3 of Fraley shows that a second set of electrode plates of a capacitor in Fraley is conductively coupled to a conductive ferrule. It would be apparent to one of ordinary skill in the art from Fig. 3 of Fraley that a conductive ferrule may be grounded or conductively coupled to the housing of an AIMD, thus making the second set of electrode plates grounded to the AIMD. (Ex. 1002 at 54.) Fraley discloses such: "feedthroughs typically include a ferrule adapted to fit within an opening [of an implantable medical device]. . . . The ferrule is typically of a metal that can be welded or otherwise joined to the housing in a hermetically sealed manner." (1:32-50; emph. added.) Fraley further discloses that "capacitor structure[s] upon the internally facing portion of the feedthrough ferrule coupled between each feedthrough conductor and a common ground, the ferrule, [can] filter out any high frequency EMI transmitted from the external lead conductor through the feedthrough conductor." (2:3-23; emph. added.) It would therefore be

apparent to one of ordinary skill in the art that the feedthrough filters (e.g., Figs. 1-10) of Fraley have a second set of electrode plates that can be grounded to an AIMD in which the feedthrough filter is installed. (Ex. 1002 at 54.)

(4) "a conductive ferrule conductively coupled to the second set of electrode plates" as recited in Claims 1 and 16

Claims 1 and 16 further recite "a conductive ferrule conductively coupled to the second set of electrode plates." Fraley discloses a conductive ferrule (e.g., 220) conductively coupled (e.g., 232, 234) to the second set of electrode plates. (*See* Fig. 3; 7:48-8:14; Ex. 1002 at 31 and 60.) Fig. 3 of Fraley shows that the second set of electrode plates of the "discoidal capacitor 212" is coupled to a "conductive ferrule 220" with "adhesive segments 232, 234." (7:48-8:7; Ex. 1002 at 31.) Specifically, Fraley discloses "conductive adhesive coupling the second pole of the discoidal capacitor 212 to the ferrule 220." (7:64-65.)

It would be apparent to one of skill in the art that the "adhesive segments 232, 234" shown in Fig. 3 of Fraley are conductive, thus making the second set of electrode plates in the "discoidal capacitor 212" conductively coupled to the "conductive ferrule 220." (Ex. 1002 at 32.) Fraley explicitly discloses "conductive adhesive coupling the second pole of the discoidal capacitor 212 to the ferrule 220." (7:64-65.) Accordingly, it would also be apparent to one of skill in the art that without being conductively coupled to the "conductive ferrule 220," the

"discoidal capacitor 212" could not function correctly, as no current could flow through the "discoidal capacitor 212." (Ex. 1002 at 32.) Other adhesive segments disclosed in Fraley are also conductive. For example, "conductive adhesive 14" is used to conductively couple a second set of electrode plates in a "discoidal capacitor 12" to a "metallic ferrule 20" in Fig. 1 (shown above) of Fraley. (4:38-52; Ex. 1002 at 32.) It would be apparent to one of skill in the art that the "adhesive segments 232, 234" shown in Fig. 3 of Fraley are conductive similar to the "conductive adhesive 14" shown in Fig. 1 of Fraley. (Ex. 1002 at 32.)

Fraley further discloses that "the discoidal capacitor electrodes that extend to the outer cylindrical surface of the stacked substrates are electrically connected together by a conductive metal layer that is deposited or otherwise formed around and over the outer cylindrical surface that thereby provides a second termination or pole of the discoidal capacitor for attachment to the ferrule 20 via conductive adhesive 16." (5:7-14; emph. added.) It would be apparent to one of skill in the art that the preceding quote from Fraley mistakenly referred to the relevant "conductive adhesive" with reference numeral "16," instead of "14." (Ex. 1002 at 33.) Accounting for this apparent error, the preceding quote from Fraley discloses that the "ferrule 20" is attached to the discoidal capacitor "via conductive adhesive 14." (*Id*.) This is readily apparent to one of skill in the art, because, as evident in Fraley, element 16 in Fig. 1 does not attach the capacitor 12 to the ferrule 20. (*Id*.)

It would be apparent to one of ordinary skill that the "adhesive segments 232, 234" of Fig. 3 in Fraley conductively couple the second set of electrodes in the "discoidal capacitor 212" to the "conductive ferrule 220." (Ex. 1002 at 33 and 34.) Accordingly, Fraley discloses a conductive ferrule (e.g., 20, 220) conductively coupled to the second set of electrode plates as recited in Claims 1 and 16.

Furthermore, Fraley discloses "a conductive ferrule conductively coupled to the second set of electrode plates" at least in Fig. 2 (e.g., 112, 132, 134, 120), Figs. 5-7 (e.g., 312, 320, 332, 334, 336, 338, 340, 342, 344, 346, 348, 350), Fig. 9 (e.g., 312, 320, 332, 350), Fig. 10 (e.g. 412, 414, 420), and the accompanying descriptions of these figures. (Ex. 1002 at 34.)

(5) "an insulator at one axial side of capacitor" as recited in Claims 1, 7, 12, and 16

Independent Claims 1, 7, 12, and 16 of the '553 patent also recite "an insulator at one axial side of capacitor." Fraley discloses an insulator (e.g., 222) at one axial side of the capacitor (e.g., 212), extending across and sealing an aperture in the ferrule (e.g., 220). (Fig. 3; 7:48-8:14; Ex. 1002 at 34, 54, 57, and 60.)

The insulator 222 is also at one axial side of the capacitor 212 in Fig. 3 of Fraley. As discussed above, an axial side of the capacitor is properly construed as a side of the capacitor along an axis of the capacitor. An axis of a discoidal capacitor such as the capacitor 212 in Fraley may coincide with the pin 230 in

Fraley. (Ex. 1002 at 35.) That is, an axis of the capacitor 212 of Fig. 3 of Fraley can be defined to run along the pin 230. (*Id.*) Accordingly, the "discoidal capacitor 212" shown in Fraley has two axial sides: a first axial side below the capacitor 212 and a second axial side toward the top of the capacitor 212 in Fig. 3. The two axial sides of the "discoidal capacitor 212" may be generally defined as shown below, where each axial side represents a side of the capacitor 212 that exists along an axis (such as an axis coinciding with pin 230) of the capacitor.

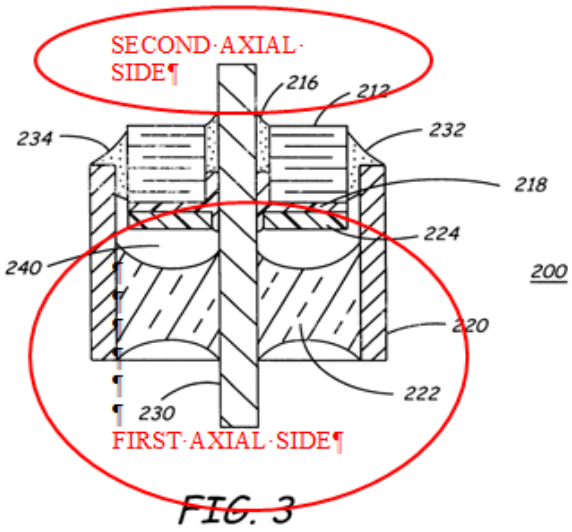


FIG. 3

Accordingly, the insulator 222 of Fig. 3 in Fraley is at one axial side of the capacitor 212 as recited in Claim 1 of the '553 Patent. (Ex. 1002 at 35.)

(6) insulator "extend[s] across and seal[s] an aperture in the ferrule" as recited in Claims 1 and 16

Independent Claims 1 and 16 of the '553 patent further recite that the insulator "extend[s] across and seal[s] an aperture in the ferrule." It would be apparent to

one of ordinary skill in the art that at least one purpose of the insulator 222 in Fig. 3 of Fraley is to extend across and seal an aperture or opening in the ferrule 220. (Ex. 1002 at 35 and 60.) For example, Claim 1 of Fraley discloses "a conductive ferrule having a ferrule inner wall hermetically sealed with and surrounding the outer insulator surface." (Emph. added.) In other words, one purpose of the insulator in Fraley is to seal an opening of the ferrule. (Ex. 1002 at 36.)

Furthermore, other insulators disclosed in Fraley extend across and seal an aperture in a ferrule. For example, Fig. 1 (shown above) of Fraley shows an "insulator 22." It would be apparent to one of ordinary skill in the art that the "insulator 22" of Fig. 1 of Fraley is similar to the "insulator 222" of Fig. 3 of Fraley in that both insulators are located at one axial side of a capacitor and extend across and seal an aperture in a ferrule. (Ex. 1002 at 36.)

With respect to the insulator 22 of Fig. 1, Fraley discloses: "[i]n the typical fabrication of a discoidal capacitive filtered feedthrough 10, the non-conductive insulator 22, pin 30 and ferrule 20 are first assembled together to form a feedthrough sub-assembly that is hermetically sealed." (5:18-21; emph. added.) Fraley also discloses that the "insulator 22" is "attach[ed] to the ferrule 20" and that the "ferrule 20 . . . adjoin[s the] insulator surface." (5:63-65.) Fraley further discloses that "the insulator 22 that is either formed in situ or brazed between the feedthrough pin 30 and ferrule 20 and provides a fluid barrier as long as the

insulator 22 (and the braze, when used) is intact. It is preferable to be able to determine whether there is a defect in the insulator 22 or its attachment to the ferrule 20 or pin 30 before it is attached to an IMD and implanted in a patient." (6:4-11; emph. added.) Fraley thus discloses that its insulator (e.g., 22, 222) both extends across an aperture and seals the aperture in a ferrule (e.g., 20, 220). (Ex. 1002 at 37.)

Furthermore, Fraley discloses "an insulator at one axial side of capacitor, extending across and sealing an aperture in the ferrule" at least in Fig. 2 (e.g., 120, 122), Fig. 7 (e.g., 320, 322), Fig. 9 (e.g., 320, 322), Fig. 10 (e.g. 420, 422), and the accompanying descriptions of these figures. (Ex. 1002 at 37.)

(7) "a conductive terminal pin extending through the insulator and the capacitor in conductive relation with the first set of electrode plates" as recited in Claims 1, 7, 12, and 16

Independent Claims 1, 7, 12, and 16 also recite "a conductive terminal pin extending through the insulator and the capacitor in conductive relation with the first set of electrode plates." Fraley discloses a conductive terminal pin (e.g., 230) extending through the insulator (e.g., 222) and the capacitor (e.g., 212) in conductive relation with the first set of electrode plates. (Fig. 3; 7:48-8:14; Ex. 1002 at 37, 54, 55, 57, 60, and 61.) Fig. 3 illustrates that the "conductive pin 230" extends through the insulator 222 and the capacitor 212. (Ex. 1002 at 37 and 38.)

Fig. 4 of Fraley also illustrates that the "conductive pin 230" extends through the capacitor 212. (Ex. 1002 at 39.) "Fig. 4 is a top plan view of the filtered feedthrough[] illustrated in Fig[]. 3." (4:13-14.)

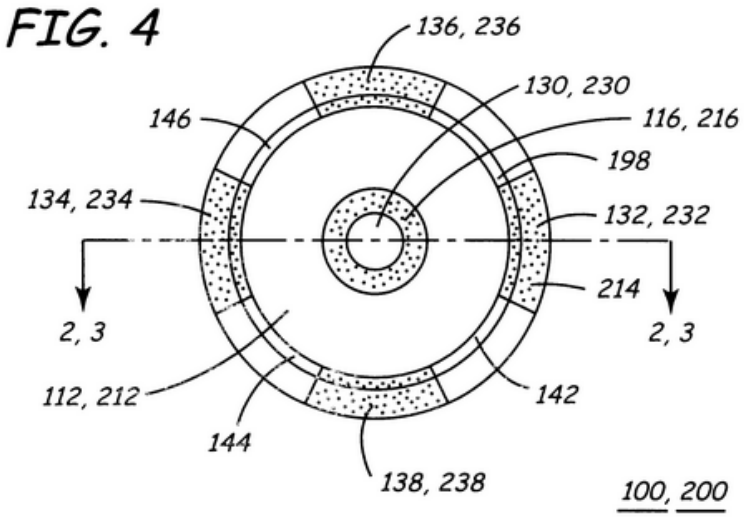


Fig. 4 of Fraley shows the "conductive pin 230" extending through the center of the "discoidal capacitor 212." (Ex. 1002 at 39.) The "conductive pin 230" of Fraley is in conductive relation with the first set of electrode plates of the "discoidal capacitor 212" as shown in Fig. 3. (Ex. 1002 at 39.) In particular, Fraley discloses that "the first pole of the discoidal capacitor 212 is coupled to the conductor pin 230 by a conductive adhesive 216." (7:54-56; emph. added.) The first pole of the discoidal capacitor 212 in Fraley corresponds to the first set of electrode plates as claimed. (4:50-5:7; Ex. 1002 at 40.) A similar example is shown in Fig. 1 of Fraley. It would be apparent to one of skill in the art that pin 230 of Fig. 3 in Fraley is similar to pin 30 of Fig. 1 in Fraley, at least with respect

to the pins extending through an insulator and a capacitor, and being in conductive relation with a first set of electrode plates in a capacitor. (Ex. 1002 at 40.)

With respect to the discoidal capacitor 12 in Fig. 1 of Fraley, "[t]he discoidal capacitor electrodes that extend to the through-hole cylindrical surface of the stacked substrates are electrically connected together by a conductive metal layer that is deposited or otherwise formed around and over the inner through-hole cylindrical surface that thereby provides a first termination or pole of the discoidal capacitor for attachment to the feedthrough pin 30." (5:1-7; emph. added.) Further, Fraley discloses that "[a]fter the non-conductive adhesive 18 solidifies, conductive adhesives 14 and 16 (or a solder or the like) are applied to make the electrical connections with the first and second poles of the discoidal capacitor 12. The conductive adhesive 16 typically extends around the entire periphery of the pin 30 and fills the entire space between the pin 30 and the pole or termination of the discoidal capacitor 12 that the pin 30 is fitted through." (5:31-38; emph. added.) Accordingly, Fraley discloses a conductive terminal pin (e.g., 30, 230) extending through the insulator (e.g., 22, 222) and the capacitor (e.g., 12, 212) in conductive relation with the first set of electrode plates. (Ex. 1002 at 41.)

Furthermore, Fraley discloses "a conductive terminal pin extending through the insulator and the capacitor in conductive relation with the first set of electrode plates" at least in Fig. 2 (e.g., 112, 122, 130), Fig. 7 (e.g., 312, 322, 330), Fig. 9

(e.g., 312, 322, 330), Fig. 10 (e.g. 412, 422, 430), and the accompanying descriptions of these figures. (Ex. 1002 at 41.)

(8) "a washer disposed between the insulator and the capacitor, wherein the insulator and the washer cooperatively define a laminar delamination gap" as recited in Claims 1, 7, 12, and 16

Independent Claims 1, 7, and 16 also require "a washer disposed between the insulator and the capacitor, wherein the insulator and the washer cooperatively define a laminar delamination gap." Independent Claim 12 requires "a washer disposed between the insulator and the capacitor, wherein the insulator and the washer cooperatively define an adhesive layer." As detailed in the claim construction discussion above (Section IV(iv)), this element in Claim 12 is properly construed to mean the same as the corresponding claim elements of Claims 1, 7, and 16 regarding the washer. That is, Claim 12 is properly construed to mean "a washer disposed between the insulator and the capacitor, wherein the insulator and the washer cooperatively define a laminar delamination gap."

Fraley discloses a washer (e.g., 224) disposed between the insulator (e.g., 222) and the capacitor (e.g., 212), wherein the insulator (e.g., 222) and the washer (e.g., 224) cooperatively define a laminar delamination gap (e.g., 240). (*See* Fig. 3; 7:48-8:14; Ex. 1002 at 41, 55, 57, and 61.) Fig. 3 of Fraley shows a washer 224 disposed between an insulator 222 and a capacitor 212. (Ex. 1002 at 42.) In

particular, Fraley discloses that "the feedthrough 200 is fabricated with an insulative spacer or washer 224 coupled to the lower, interior surface of the discoidal capacitor 212 by a non-conductive adhesive 218." (7:57-60; emph. added.)

Fraley further discloses that the washer 224 is "otherwise configured as described above with respect to washer 124." (7:61-62.) The washer 124 is shown in Fig. 2 of Fraley. It would be apparent to one of skill in the art that the washer 224 in Fig. 3 is similar to the washer 124 in Fig. 2, at least in that both washers are disposed between an insulator and a capacitor. (Ex. 1002 at 42.) Fraley even discloses that "the non-conductive spacer or washer 124 is inserted over the pin 130 and between the facing end surfaces of the discoidal filter 112 and the insulator 122." (6:38-40; emph. added.)

Accordingly, Fraley discloses a washer (e.g. 124, 224) disposed between an insulator (e.g., 122, 222) and a capacitor (e.g., 112, 212) as claimed. (Ex. 1002 at 43.) Fraley also discloses that an insulator (e.g., 122, 222) and washer (e.g., 124, 224) cooperatively define a laminar delamination gap (e.g., 140, 240) as claimed. (Ex. 1002 at 43.) As shown in Figs. 2 and 3 of Fraley above, a "space 140" and an "interior space 240" are disclosed between the insulator (e.g., 122, 222) and the washer (e.g., 124, 224). (Ex. 1002 at 43.) This space extends up between the ferrule (e.g., 120, 220) and the combination of the washer (e.g., 124, 224), the

adhesive (e.g., 218), and the capacitor (e.g., 112, 212). (Ex. 1002 at 43.) It would be apparent to one of ordinary skill that the "space 140" and the "interior space 240" of Fraley are both a "laminar delamination gap cooperatively defined by an insulator and a washer," as claimed. (Ex. 1002 at 43.)

One of ordinary skill in the art would not immediately recognize the claim term "laminar delamination gap." (Ex. 1002 at 43.) However, as discussed above, the broadest reasonable construction of "laminar delamination gap" is a layer of space between materials through which helium may pass to an outside edge of the capacitor. (*See* Ex. 1002 at 43 and 44.) In the claim, the "laminar delamination gap" is cooperatively defined by the washer and the insulator. It would be apparent to one of ordinary skill that the space 140 of Fig. 2 in Fraley is cooperatively defined by the washer 124 and the insulator 122 of Fig. 2. (Ex. 1002 at 44.) Similarly, the space 240 of Fig. 3 in Fraley is cooperatively defined by the washer 224 and the insulator 222 of Fig. 3. (Ex. 1002 at 44.) Fraley also describes a "space 140" where "helium gas [can] pass through if the insulator 122 or its braze . . . is not hermetic," and that a "gas flow passage [] extends from the upper, inner surface of insulator 122." (7:18-21 and 27-29.) Accordingly, it would be apparent to one of skill in the art that the spaces 140 and 240 of Fraley are the same as a the claimed "laminar delamination gap," insofar as both the spaces 140 and 240 of Fraley and the "laminar delamination gap" as claimed provide a layer

of space between materials through which helium may pass to an outside edge of the capacitor, where the gap is cooperatively defined by a washer and insulator. (Ex. 1002 at 44.)

Fraley further discloses that the passage of helium gas is to the outside edge of the capacitor. (6:55-7:4; 7:12-22 and 36-47; 7:56-8:3; 8:56-67; 9:20-25 and 39-52; Figs. 2-4 and 9; Ex. 1002 at 44.) Specifically, with regard to Fig. 3, Fraley discloses that "[t]he insulative washer outer diameter is smaller than the inner diameter of the ferrule 220 or otherwise configured as described above with respect to washer 124, thereby providing a gap for the passage of leak test gas. And, again, the conductive adhesive coupling the second pole of the discoidal capacitor 212 to the ferrule 220 is formed preferably with at least one gap providing a **gas pathway** from the interior space 240 of the feedthrough 200 providing a **gas pathway which bypasses the discoidal capacitor 212** and allows the feedthrough 200 to be readily leak tested after fabrication is completed." (7:60-8:3; emph. added.) Accordingly, it would be apparent to one of ordinary skill in the art that since Fraley provides a washer attached to the capacitor that allows passage of helium between the edge of the washer and the ferrule and bypasses the capacitor, Fraley discloses a layer of space between materials through which helium may pass to an outside edge of the capacitor. (Ex. 1002 at 45.)

Additionally, Fraley discloses "a washer disposed between the insulator and the capacitor, wherein the insulator and the washer cooperatively define a laminar delamination gap" at least in Fig. 9 (e.g., 322, 324, 390 (although 390 is mistakenly labeled as 340 in Fig. 9)) and Fig. 10 (e.g., 422, 424, 440), and the accompanying descriptions of these figures. (Ex. 1002 at 45.)

As noted above in section IV(ii), the Patent Owner has previously argued that a "laminar delamination gap" should be construed as a "very thin space between layers of material allowing passage of helium gas to the outer edges of the capacitor." (Ex. 1009 at 37.) Even if, *arguendo*, the Board were to adopt the Patent Owner's previously argued claim construction, Fraley still discloses the claimed "laminar delamination gap." With respect to Patent Owner's previous construction that a space by "very thin," Fraley discloses that gaps provided in the feedthrough "can be minute in cross-section and not visible to the eye." (7:31-32 emph. added; *see also* 8:13-14.) A minute gap as in Fraley discloses a very thin space as previously argued by the Patent Owner. (Ex. 1002 at 45.) Further, the Patent Owner's previously argued construction requires that a laminar delamination gap be "between layers of material." As shown in Fig. 3 of Fraley above, the space 240 is located between the insulator 222 and the washer 224. It would be apparent to one of skill in the art that the washer 224 and the insulator 222 are "layers of material." (Ex. 1002 at 46.) Indeed, Fraley discloses that its

"pre-formed insulative washer provides an insulation layer." (3:49-50.) Accordingly, the space 240 in Fraley is equivalent to a "very thin space between layers of material" in the event that the Board adopts the previously proposed claim construction of the Patent Owner. (Ex. 1002 at 46.)

(9) "an adhesive layer disposed between the capacitor and the washer" as recited in Claims 1, 7, 12, and 16

Independent Claims 1, 7, and 16 recite "an adhesive layer disposed between the capacitor and the washer." Independent Claim 12 recites "a laminar delamination gap, disposed between the capacitor and the washer." As discussed above (Section IV(iv)), this claim element in Claim 12 is construed to mean the same as the corresponding claim elements of Claims 1, 7, and 16 regarding the adhesive layer. That is, Claim 12 is properly construed to mean "an adhesive layer disposed between the capacitor and the washer."

Fraley discloses an adhesive layer (e.g., 218) disposed between the capacitor (e.g., 212) and the washer (e.g., 224). (Fig. 3; 7:48-8:14; Ex. 1002 at 46, 55, 57, and 61.) As shown in Fig. 3, a "non-conductive adhesive 218" is disposed between the capacitor 212 and the washer 224. (7:59-60; Ex. 1002 at 46.) Fraley further discloses that "the feedthrough 200 is fabricated with an insulative spacer or washer 224 coupled to the lower, interior surface of the discoidal capacitor 212 by a non-conductive adhesive 218." (7:57-60; emph. added.)

Fig. 2 of Fraley shows a similar adhesive 118 (although the reference numeral 118 in Fig. 2 mistakenly points to the washer 124). (Ex. 1002 at 47.) Fraley further discloses that the "inner or lower surface of the discoidal capacitor 112 then is adhered via the non-conductive adhesive 118 to the washer 124." (6:47-49.) Accordingly, it would be apparent to one of ordinary skill in the art that Fraley discloses an adhesive layer (e.g., 118, 218) disposed between the capacitor (e.g., 112, 212) and the washer (e.g., 124, 224) as claimed. (Ex. 1002 at 47.)

Fraley also discloses "an adhesive layer disposed between the capacitor and the washer" at least in Fig. 9 (e.g., 312, 318, 324) and Fig. 10 (e.g., 412, 418, 424), and the accompanying descriptions of these figures. (Ex. 1002 at 47.)

(10) "the adhesive layer is formed from a liquid polymer, an adhesive washer, or a thermal plastic adhesive coated material" as recited in Claim 7

Independent Claim 7 further recites that "the adhesive layer is formed from a liquid polymer, an adhesive washer, or a thermal plastic adhesive coated material." Fraley discloses that an adhesive layer between a capacitor and washer may be formed from a liquid polymer. (Ex. 1002 at 48 and 55.) "The non-conductive adhesive 118, 218, 318 may be an epoxy (paste or performed) or any other polymeric non-conductive adhesive such as Ablestick 789-3 adhesive provided by ABLESTIK LABORATORIES of Rancho Dominguez, Calif." (10:2-8; emph. added.) This disclosure in Fraley is an "adhesive layer" and Fraley's disclosure of

a "polymeric adhesive" discloses that the "adhesive layer" may be formed from a "liquid polymer," as required by Claim 7 of the '553 patent. (Ex. 1002 at 48.)

Additionally, the requirement that the "adhesive layer" be "formed from a liquid polymer, an adhesive washer, or a thermal plastic adhesive coated material" results in a product-by-process claim as noted above in the claim construction section (section IV(vi)). As discussed above, product-by-process elements are not considered for the determination of patentability (and therefore validity). In other words, the patentability of a product-by-process claim is based on the product itself, not the process by which the product is formed. Thus, Claim 7 is construed to mean "the adhesive layer comprises a polymer, an adhesive washer, or a thermal plastic adhesive coated material." Since, as noted above, Fraley discloses that its "non-conductive adhesive 118, 218, 318 may be . . . [a] polymeric non-conductive adhesive," an adhesive layer made of a polymer as claimed is explicitly disclosed. (10:2-8; Ex. 1002 at 48.) Accordingly, Fraley discloses an adhesive layer that is structurally the same as the adhesive layer of Claim 7. (Ex. 1002 at 48.)

(11) "the capacitor, adhesive layer and washer are laminated together" as recited in Claim 12

Independent Claim 12 requires "that the capacitor, adhesive layer and washer are laminated together." Fraley discloses an adhesive layer (e.g. 218) disposed between a capacitor (e.g. 212) and a washer (e.g., 224), such that the capacitor (e.g.

212), adhesive layer (e.g. 218), and washer (e.g., 224) are laminated together, as recited in Claim 12 of the '553 Patent. (Fig. 3; 7:56-60; Ex. 1002 at 57.)

In particular, Fraley discloses that "the feedthrough 200 is fabricated with an insulative spacer or washer 224 coupled to the lower, interior surface of the discoidal capacitor 212 by a non-conductive adhesive 218." (7:56-60.) The claim term "laminated together" is construed above to mean adhered together in layers. Here, Fraley discloses an adhesive 218, a capacitor 212, and a washer 224 all adhered together in layers by the adhesive 218 itself. (Ex. 1002 at 58.) Accordingly, Fraley discloses that a "capacitor, adhesive layer and washer are laminated together," as required by Claim 12 of the '553 Patent. (Ex. 1002 at 58.)

ii. Dependent Claims 2 and 17

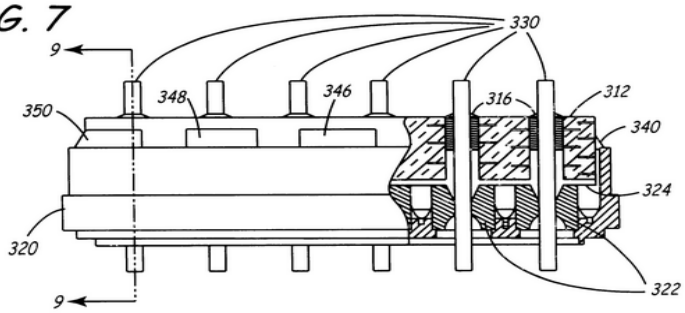
Dependent Claims 2 and 17 require that "the adhesive layer is formed from a liquid polymer, an adhesive washer, or a thermal plastic adhesive coated material." Similar language is recited in independent Claim 7. Accordingly, Fraley discloses the elements recited in Claims 2 and 17 for the same reasons discussed above in section V(i)(10) with respect to Claim 7. (Ex. 1002 at 48, 55, and 61.)

iii. Dependent Claims 3, 8, 13, and 18

Dependent Claims 3, 8, 13, and 18 require that "the conductive terminal pin comprises a corresponding plurality of conductive terminal pins extending respectively through the insulator and the capacitor in conductive relation with the

first set of electrode plates." Fraley discloses that a conductive terminal pin comprises a corresponding plurality of conductive terminal pins (e.g., 330) extending respectively through the insulator (e.g., 322) and the capacitor (e.g., 312 of Figs. 7 and 9 of Fraley) in conductive relation with the first set of electrode plates. (*See* Figs. 7 and 9; 8:15-9:25; Ex. 1002 at 48, 49, 55, 59, and 61.) Figs. 7 and 9 are shown below for convenience.

FIG. 7



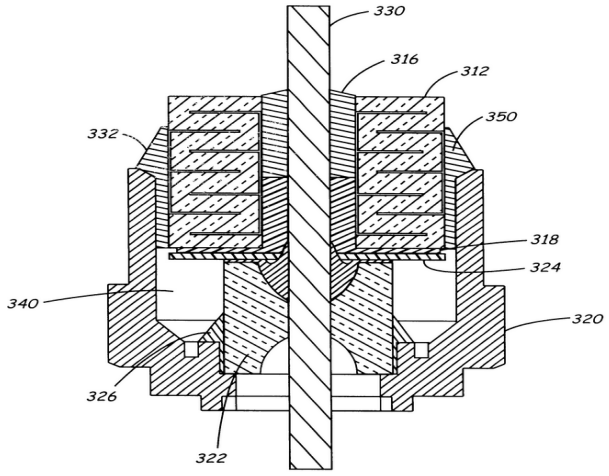


FIG. 9

Accordingly, the multiple pins 330 of Fraley are the same as a plurality of conductive terminal pins as claimed in the '553 Patent. (Ex. 1002 at 49 and 50.)

The pins 330 of Fraley, as seen in Figs. 7 and 9, all extend through insulators 322. (*See* 8:47-53 and 56-60; Ex. 1002 at 50.) It would have been apparent to one of ordinary skill in the art that the insulator as claimed could be a single insulator that all of the pins extend through or a plurality of insulators where each pin passes through a separate insulator. (Ex. 1002 at 49 and 50.) Accordingly, the claimed "insulator" is construed as indicated in section IV(iii) above to mean one or more insulators. In other words, the insulators 322 shown in Figs. 7 and 9 of Fraley disclose "the insulator" recited in the '553 Patent. (Ex. 1002 at 50.)

Further, the pins 330 of Fraley are in conductive relation with a first set of plates of the capacitor 312, just as the pin 230 of Fig. 3 in Fraley is in conductive relation to a first set of plates of a capacitor 212 as discussed with respect to Claim 1. (Ex. 1002 at 50.) Fraley discloses that the capacitor 312 is a single capacitor, or could be formed as discrete capacitors as well: "a discoidal capacitor array 312 is depicted having six integrally formed capacitive filters, it will be understood that a plurality of discretely formed discoidal capacitors could be employed instead that are each inserted into a ferrule having discrete cylindrical walls for receiving the discretely formed discoidal capacitors." (8:40-45; emph. added.)

Accordingly, Fraley discloses that a conductive terminal pin comprises a corresponding plurality of conductive terminal pins (e.g., 330) extending respectively through the insulator (e.g., 322) and the capacitor (e.g., 312 of Figs. 7

and 9 of Fraley) in conductive relation with the first set of electrode plates. (Ex. 1002 at 50.)

iv. Dependent Claims 4, 9, 14, and 19

Dependent Claims 4, 9, 14, and 19 require that "the insulator comprises a plurality of insulators corresponding to a plurality of ferrule apertures." Fraley discloses that the insulator (e.g., 322) comprises a plurality of insulators that correspond to a plurality of ferrule (e.g., 320) apertures. (*See* Figs. 7 and 9; 8:15-9:25; Ex. 1002 at 50, 51, 55, 56, 59, 61, and 62.)

Figs. 7 and 9 of Fraley show a plurality of insulators that correspond to a plurality of ferrule apertures. (Ex. 1002 at 51.) Fraley also discloses that "[e]ach feedthrough pin 330 is separately supported by its own cylindrical insulator 322 that is mechanically attached to a circular recess of the ferrule 320 employing a brazing pre-form 326." (8:47-51; emph. added.) Fraley also discloses that "several feedthrough pins 330 [are] supported within a common ferrule 320 by a plurality of insulators 322." (8:17-18; emph. added.) Accordingly, Fraley discloses that the insulator (e.g., 322) comprises a plurality of insulators that correspond to a plurality of ferrule (e.g., 320) apertures. (Ex. 1002 at 52.)

v. Dependent Claims 5, 10, and 20

Dependent Claims 5, 10, and 20 recite that "the washer is formed from a nonconductive polyimide sheet or a thin sheet of alumina." Fraley discloses

several washers (e.g., 124, 224, 324). (6:26-7:4; 7:56-64; 8:56-9:5; 9:19-25 and 39-53; 10:24, 25, and 36-44.) Fraley further discloses that its washers are non-conductive. (6:29-39; 7:57-64; 8:56-9:19.) Fraley further discloses that its non-conductive spacers or washers (e.g., 124, 224, 324) may be formed from a nonconductive polyimide sheet. (Ex. 1002 at 52, 56, and 62.) "The spacer 124, 224, 324 may be fabricated of polymeric materials, e.g., polyimide." (10:24-25.) It would be apparent to one of skill in the art that the reference to "polymeric materials" such as "polyimide" in Fraley refers to forming a washer or spacer from a nonconductive polyimide sheet as claimed. (Ex. 1002 at 52.) Further, it was well known at the time of the '553 patent to form a washer for feedthrough filters from a nonconductive polyimide sheet or a thin sheet of alumina. (Ex. 1002 at 52.)

Furthermore, Claim 5 requires that the "washer" be "formed from a nonconductive polyimide sheet or a thin sheet of alumina." (Emph. added.) These elements (particularly "formed from," "sheet," and "thin sheet") recite product-by-process claim elements, which are not considered for the determination of patentability (and therefore validity), as discussed above. Claim 5 is properly construed to mean "the washer comprises nonconductive polyimide or alumina." Since, as noted above, Fraley discloses that its washers are non-conductive and "may be fabricated of polymeric materials, e.g., polyimide," a washer made of non-conductive polyimide as claimed is explicitly disclosed by Fraley. (10:24-25;

Ex. 1002 at 53.) Accordingly, Fraley discloses a washer that is structurally the same as the washer of Claims 5, 10, and 20. (Ex. 1002 at 53.)

vi. Dependent Claims 6, 11, and 15

Dependent Claims 6, 11, and 15 recite that "the AIMD is a cardiac pacemaker, a cardiac sensing system, a neurostimulator, a cochlear implant, a deep brain stimulator, an implantable defibrillator, a congestive heart failure device, a hearing implant, a drug pump, a ventricular assist device, an insulin pump, a spinal cord stimulator, an artificial heart, an incontinence device, a bone growth stimulator, a gastric pacemaker, or a prosthetic device." Fraley discloses that its feedthrough capacitors (e.g., 10, 100, 200, 300, 400) may be used with varying active implantable medical devices such as "implantable pulse generators (IPGs) for cardiac pacemakers, implantable cardioverter/defibrillators (ICDs), nerve, brain, organ and muscle stimulators and implantable monitors, or the like." (1:20-24; Ex. 1002 at 53, 56, 59, and 60.) Accordingly, Fraley discloses at least the use of a feedthrough filter with a cardiac pacemaker, as well as other devices. (Ex. 1002 at 53.)

Ground 2. Fraley in view of Brendel renders Claims 2, 7, and 17 unpatentable.

Claims 2, 7, and 17 of the '553 patent are unpatentable under 35 USC § 103(a) as obvious over Fraley (Ex. 1003) in view of U.S. Patent No. 6,765,780 ("Brendel," Ex. 1004).

Independent Claim 7 and dependent Claims 2 and 17 all recite that "the adhesive layer is formed from a liquid polymer, an adhesive washer, or a thermal plastic adhesive coated material." Independent Claim 7 recites additional elements, and those elements are all disclosed by Fraley, as discussed above in section V(i).

As discussed, Fraley discloses that an adhesive layer between a capacitor and washer may be formed from a liquid polymer. (Ex. 1002 at 48, 55, and 61; *see also* Ex. 1002 at 63, 81, and 82.) "The non-conductive adhesive 118, 218, 318 may be an epoxy (paste or performed) or any other polymeric non-conductive adhesive such as Ablestick 789-3 adhesive provided by ABLESTIK LABORATORIES of Rancho Dominguez, Calif." (10:2-8; emph. added.) It would have been apparent to one of ordinary skill in the art that an epoxy is a type of adhesive. (Ex. 1002 at 63.) This disclosure in Fraley is an "adhesive layer" and Fraley's disclosure of a polymeric adhesive discloses that the "adhesive layer" may be formed from a "liquid polymer," as recited in Claim 2 of the '553 patent. (Ex. 1002 at 63.) The disclosure in Fraley explicitly discloses at least an "adhesive layer" as recited in Claim 2 of the '553 Patent. (Ex. 1002 at 63.)

Although Fraley explicitly discloses at least an "adhesive layer" as discussed above with respect to Claim 2, Fraley does not explicitly disclose that the "adhesive layer" is "formed from a liquid polymer, an adhesive washer, or a thermal plastic adhesive coated material." (Ex. 1002 at 63 and 64.)

Brendel discloses a "thermalsetting insulative material 448," shown in Fig. 24 of Brendel. (Ex. 1002 at 64.) Brendel further discloses that an example of the "thermalsetting insulative material 448 is a unique thermal polyimide supportive tape (coated with thermalsetting adhesive) manufactured by Ablestik Electronic Materials and Adhesives . . . . This material, which is known as Ableloc 5500, is unique in that it has the high temperature characteristics of a polyimide and yet will not flow." (16:3-19.) It would have been apparent to one of ordinary skill in the art that this "unique thermal polyimide supportive tape (coated with thermalsetting adhesive)" as in Brendel is the same as the "thermal plastic adhesive coated material" as recited in Claim 2 of the '553 Patent. (Ex. 1002 at 64.) The '553 patent validates this, stating that "[t]he most suitable material for [an adhesive layer] is a thermal plastic adhesive coated tape material." (6:11-15; emph. added.) It would further be apparent to one of skill in the art that a polyimide is a type of plastic. (Ex. 1002 at 64.) Indeed, Brendel also refers to Ableloc as mentioned above as a "thermal plastic polyimide supported tape." (9:41-42; emph. added.) Elsewhere, Brendel refers to Ableloc 5500 as a "high temperature thermal plastic

polyimide supportive tape." (17:21-22; emph. added.) Accordingly, the "thermal plastic adhesive coated material" as recited by Claim 2 of the '553 patent is the same as the "thermal polyimide supportive tape (coated with thermalsetting adhesive)" and "thermal plastic polyimide supportive tape" as disclosed by the Brendel reference. (Ex. 1002 at 64.)

Furthermore, Brendel discloses that its "thermal plastic polyimide supportive tape" could be replaced by "B staged epoxy washers." (17:21-25; emph. added.) Accordingly, Brendel also discloses an "adhesive washer" as recited in Claim 2 of the '553 Patent. (Ex. 1002 at 65.) It would be apparent to one of ordinary skill in the art that an "adhesive washer" and an "epoxy washer" would be the same thing, since an epoxy is a type of adhesive. (Ex. 1002 at 65.)

Since both Brendel and Fraley teach attaching a capacitor (e.g., 212 of Fraley, 400 of Brendel) to a non-conductive component (e.g., non-conductive washer 224 of Fraley, insulator 424 of Brendel) with an adhesive layer (such as an epoxy), it would have been obvious to one of ordinary skill in the art to substitute the "thermal polyimide supportive tape (coated with thermalsetting adhesive)" or the "epoxy washers" of Brendel for the "epoxy" in a feedthrough filter capacitor assembly for the same purpose and use as recited in Claim 2 of the '553 Patent. (Ex. 1002 at 66 and 67.)

i. Reasons to Combine Fraley with Brendel

It would have been obvious to one of ordinary skill in the art to combine the "thermal polyimide supportive tape (coated with thermalsetting adhesive)" or the "epoxy washers" of Brendel with the teachings of Fraley. (Ex. 1002 at 65.) Doing so would merely have amounted to substituting one element for another known element in the same field (e.g., substituting the "thermal polyimide supportive tape (coated with thermalsetting adhesive)" or the "epoxy washers" as taught in Brendel for the "epoxy" or adhesive layer of Fraley). (Ex. 1002 at 65.) Such a combination would still result in a washer as in Fraley being bonded to a capacitor as in Fraley.

Further, such a modification would have resulted in the predictable use of prior art elements according to their established functions. (Ex. 1002 at 65.) The Brendel reference teaches that its "thermal polyimide supportive tape (coated with thermalsetting adhesive)" or "epoxy washers" are used in a similar manner that Fraley utilizes an epoxy. (Ex. 1002 at 65.) For example, Fig. 24 of Brendel shows the "thermalsetting insulative material 448" being used to adhere an "insulator 424" and "capacitor 400." (16:1-26.)

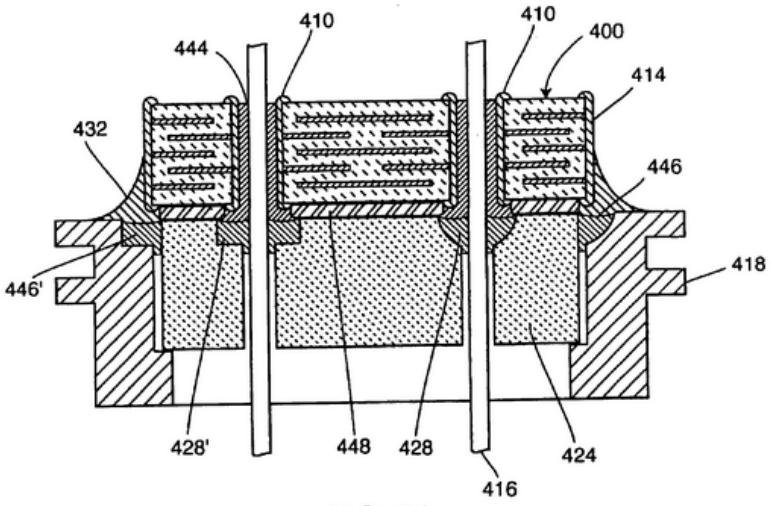


FIG. 24

In the same way demonstrated by Fig. 24 of Brendel, Fraley teaches in Fig. 3 (shown above) using an epoxy to adhere a "washer 224" (which is also non-conductive like the insulator 424 of Brendel) to a "capacitor 212." (7:56-60; Ex. 1002 at 66.)

Ground 3. Fraley in view of Applicant Admitted Prior Art renders Claims 3, 8, 13, and 18 unpatentable.

Claims 3, 8, 13, and 18 of the '553 patent are unpatentable under 35 U.S.C. § 103(a) over Fraley (Ex. 1003) in view of Admitted Prior Art.

Claims 3, 8, 13, and 18 all require that "the conductive terminal pin comprises a corresponding plurality of conductive terminal pins extending respectively through the insulator and the capacitor in conductive relation with the first set of electrode plates." Fraley discloses that a conductive terminal pin comprises a corresponding plurality of conductive terminal pins (e.g., 330 of Figs. 7 and 9 of Fraley; 14 of

Fig. 2 of admitted prior art in the '553 Patent) extending respectively through the insulator (e.g., 36 of Fig. 2 of admitted prior art in the '553 Patent) and the capacitor (e.g., 312 of Figs. 7 and 9 of Fraley; 16 of Fig. 2 of admitted prior art in the '553 Patent) in conductive relation with the first set of electrode plates. (Figs. 7 and 9; 8:15-9:25; Ex. 1002 at 83, 88, and 89.)

The pins 330 of Fraley are in conductive relation with a first set of plates of the capacitor 312, just as the pin 230 of Fig. 3 in Fraley is in conductive relation to a first set of plates of a capacitor 212 as discussed above with respect to Claim 1. (Ex. 1002 at 84.) Fraley discloses that the capacitor 312 is a single capacitor as claimed, or could be formed as discrete capacitors as well: "a discoidal capacitor array 312 is depicted having six integrally formed capacitive filters, it will be understood that a plurality of discretely formed discoidal capacitors could be employed instead that are each inserted into a ferrule having discrete cylindrical walls for receiving the discretely formed discoidal capacitors." (8:40-45; emph. added.) The multiple pins 330 of Fraley are also the same as a plurality of conductive terminal pins as claimed in the '553 Patent. (Ex. 1002 at 84 and 85.) The pins 330 of Fraley, as seen in Figs. 7 and 9, all extend through insulators 322. (*See* 8: 47-53 and 56-60.)

Fraley explicitly discloses that the insulators 322 of Figs. 7 and 9 are a "plurality of insulators 322." (Ex. 1002 at 85.) For example, Fraley discloses that

"[e]ach feedthrough pin 330 is separately supported by its own cylindrical insulator 322 that is mechanically attached to a circular recess of the ferrule 320 employing a brazing pre-form 326." (8:47-51.) Fraley also discloses that "several feedthrough pins 330 [are] supported within a common ferrule 320 by a plurality of insulators 322." (8:17-18.) Claim 3 of the '553 patent merely recites "the insulator." Although the claimed "insulator" is construed to mean one or more insulators, Fraley does not explicitly disclose multiple pins extending through a single insulator. (Ex. 1002 at 85.) However, a single insulator with multiple pins extending through it is disclosed as admitted prior art in the '553 patent.

Fig. 2 of the '553 patent discloses a "plurality of conductive terminal pins extending respectively through the insulator and the capacitor in conductive relation with the first set of electrode plates," as required by Claim 3. Fig. 2 is labeled as "prior art" in the '553 patent, and shows a plurality of conductive terminal pins (e.g., 14) extending respectively through the insulator (e.g., 36) and the capacitor (e.g., 16) in conductive relation with the first set of electrode plates as claimed. (*See* 2:29-60; Ex. 1002 at 85.) Fig. 2 of the '553 patent is shown below for convenience.

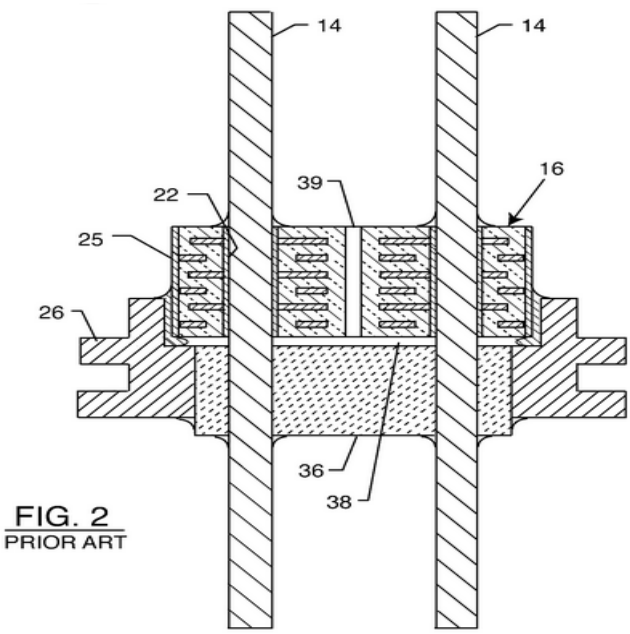


FIG. 2
PRIOR ART

In addition to the insulator 36 of Fig. 2 appearing to be only a single insulator, the '553 patent only refers to the "insulator 36" of the admitted prior art Fig. 2 in the singular form, indicating that there are multiple pins passing through only one insulator. (*See* 2:33-38 and 55; 5:22 and 30.)

Accordingly, Fraley in combination with the admitted prior art discloses that a conductive terminal pin comprises a corresponding plurality of conductive terminal pins (e.g., 330 of Figs. 7 and 9 of Fraley) extending respectively through the insulator (e.g., 36 of Fig. 2 of admitted prior art in the '553 Patent) and the capacitor (e.g., 312 of Figs. 7 and 9 of Fraley; 16 of Fig. 2 of admitted prior art in the '553 Patent) in conductive relation with the first set of electrode plates. (Ex. 1002 at 86.)

i. Reasons to Combine Fraley with Admitted Prior Art

It would have been obvious to one of ordinary skill in the art to combine the features of the Fraley reference (multiple pins passing through a capacitor and insulators) with the admitted prior art of the '553 patent (multiple pins passing through a capacitor and a single insulator) to yield the claimed invention because both Fraley and the admitted prior art of the '553 patent are related to feedthrough filter capacitors that filter electromagnetic interference (EMI), and more specifically are designed to facilitate effective helium leak testing to ensure that the feedthrough filter capacitors can be effective in an implantable medical device. (Ex. 1002 at 86 and 87.) One of ordinary skill in the art would have been motivated to combine Fraley and the admitted prior art in the '553 patent because such a combination would have allowed for the possibility of a more compact and easier to manufacture filter feedthrough capacitor assembly. (Ex. 1002 at 87.) For example, utilizing a single insulator would reduce the number of apertures in the ferrule that must be brazed and sealed closed. For example, the cross-section shown in the admitted prior art Fig. 2 of the '553 Patent shows only one aperture in the ferrule 26 filled with the insulator 36 where the ferrule 26 and the insulator 36 are brazed together. In contrast, Figs. 7 and 9 of Fraley show six apertures in the ferrule 320 filled with the insulators 322 that are all brazed together separately. Accordingly, one of skill in the art would have been motivated to make the

combination to allow for an assembly that reduced the number of brazes present. (Ex. 1002 at 87.) Furthermore, reducing the number of brazes would also reduce the number of potential failure points for the hermetic seal and helium testing of the hermetic seal of a feedthrough filter capacitor. Since both Fraley and the admitted prior art of the '553 patent are directed toward improving filter feedthrough capacitors for helium leak testing, one of skill in the art would have been motivated to combine the two features to further increase the likelihood that a given feedthrough filter capacitor passes a helium leak test. (Ex. 1002 at 87.)

In addition, the modification would have resulted in the predictable use of prior art elements according to their established functions. Whether multiple insulators (as in Figs. 7 and 9 of Fraley) or a single insulator (as in the admitted prior art in the '553 patent) is used would not affect how the insulator(s) actually function. (Ex. 1002 at 87 and 88.) Accordingly, one of ordinary skill in the art would readily recognize that a single insulator or multiple insulators could be used in a predictable manner to yield a similar result. (Ex. 1002 at 88.)

Ground 4. Fraley in view of Snow renders Claims 5, 10, and 20 unpatentable.

Claims 5, 10, and 20 of the '553 patent are unpatentable under 35 U.S.C. § 103(a) over Fraley (Ex. 1003) in view of U.S. Patent No. 4,246,556 ("Snow," Ex. 1005).

Dependent Claims 5, 10, and 20 all require that "the washer is formed from a nonconductive polyimide sheet or a thin sheet of alumina." Fraley discloses several washers (e.g., 124, 224, 324). (*See* 6:26-7:4; 7:56-64; 8:56 -9:5; 9:25 and 39-53;10:24, 25, and 36-44.) Fraley further discloses that its washers are non-conductive. (6:29-39; 7:57-64; 8:56; 9:1, 5, and 19.) Fraley further discloses that its non-conductive spacers or washers (e.g., 124, 224, 324) may be formed from polymeric materials such as polyimide: "The spacer 124, 224, 324 may be fabricated of polymeric materials, e.g., polyimide." (10:24-25.) Accordingly, Fraley explicitly discloses non-conductive washers made from polyimide. (Ex. 1002 at 89, 90, and 92.)

Although Fraley explicitly discloses at least "non-conductive washers made from polyimide," Fraley does not appear to explicitly disclose that the "washer" is "formed from a nonconductive polyimide sheet or a thin sheet of alumina." (Ex. 1002 at 90.) However, Snow explicitly discloses "a polyimide insulating washer 60." (2:42-43; emph. added); *see also* 2:62-3:3.) Snow further discloses that its "insulating washer 60 [] has been punched from a sheet of the previously described polyimide material." (2:62-64; emph. added.) Accordingly, Snow discloses that a washer may be formed from a non-conductive polyimide sheet as required by Claims 5, 10, and 20 of the '553 Patent. (*See* Ex. 1002 at 90.)

i. Reasons to Combine Fraley with Snow

It would have been obvious to combine the teaching of Fraley's non-conductive washer made from polyimide with the teaching of Snow that a non-conductive polyimide washer may be punched or formed from a sheet of polyimide. (Ex. 1002 at 90.) One of ordinary skill in the art would have been motivated to combine Fraley and Snow in this manner because Fraley teaches the use of a non-conductive polyimide washer, and Snow teaches that such a component may be formed from a sheet of non-conductive polyimide. (Ex. 1002 at 90.) One of ordinary skill seeking to manufacture the non-conductive polyimide washers of Fraley would have utilized known methods to manufacture such washers, such as punching the washers from a sheet as disclosed in Snow. (Ex. 1002 at 90 and 91.) One of ordinary skill in the art would have recognized the technique of Snow as a viable and practicable way to make the washers taught in Fraley. (Ex. 1002 at 91.)

In addition, the combination of Fraley and Snow would have resulted in the predictable use of prior art elements according to their established functions. (Ex. 1002 at 91.) Snow teaches punching washers from non-conductive sheets of polyimide. Fraley teaches utilizing non-conductive washers made from polyimide. Accordingly, a washer as disclosed in Snow would be used according to its established qualities, traits, and established functions. (Ex. 1002 at 91.) As just one example, Fraley discloses that a conductive object (e.g., a pin 130) exists in the

center of the washer (e.g., washer 124), and that epoxy or adhesive (e.g., adhesive 18) is applied to the washer to attach another object (e.g., capacitor 112) to the washer. (*See* 6:38-54.) Similarly, Snow discloses that a conductive object (e.g. electrode lead 50, electrode lead 55, diode 40) exists in the center of the washer (e.g., washer 60), and that epoxy or adhesive is applied to the washer to attach another object (e.g., gold disk 70) to the washer. (*See* 2:54-3:9 and Fig. 1 (reproduced below).)

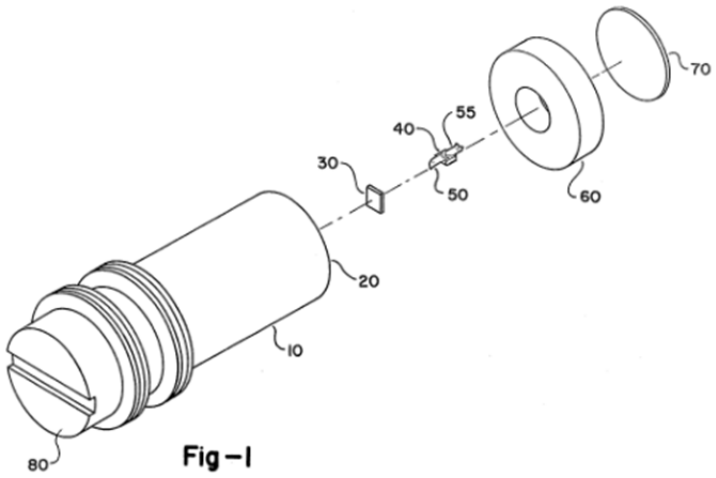


Fig – I

Accordingly, since Fraley and Snow both teach a non-conductive washer made from polyimide and used for a similar purpose, it would have been obvious to one of ordinary skill in the art to form the washer of Fraley in the manner taught by Snow. (Ex. 1002 at 91 and 92.)

Further, since the washer of Snow is made of the same material and used for a similar purpose as the washer in Fraley, it would have been obvious to one of

ordinary skill in the art to substitute the washer of Snow for the washer of Fraley. (Ex. 1002 at 92.) Doing so would have merely amounted to substituting one element for another known element in the same field (e.g., substituting a non-conductive washer formed from a polyimide sheet for a non-conductive washer made of polyimide). Such a substitution would still result in the feedthrough filter capacitor disclosed in Fraley, regardless of how the washer used in the assembly is formed. (Ex. 1002 at 92.)

CONCLUSION

For the foregoing reasons, Petitioner respectfully requests that Trial be instituted and that claims 1-20 be canceled.

Respectfully submitted,

Dated: February 6, 2015

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that a copy of the foregoing Petition for Inter Partes Review together with all exhibits and other papers filed therewith was served on February 6, 2015, by United States Postal Service Express Mail directed to the attorneys of record for the patent at the following address:

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