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. 7,035,077
Issue Date: April 25, 2006
Title: DEVICE TO PROTECT AN ACTIVE IMPLANTABLE MEDICAL DEVICE FEEDTHROUGH CAPACITOR FROM STRAY LASER WELD STRIKES, AND RELATED MANUFACTURING PROCESS

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.*

TABLE OF CONTENTS

EXHIBIT LIST iv
NOTICE OF LEAD AND BACKUP COUNSEL 1
NOTICE OF EACH REAL-PARTY-IN-INTEREST 1
NOTICE OF RELATED MATTERS 1
NOTICE OF SERVICE INFORMATION 1
GROUNDS FOR STANDING 1
STATEMENT OF MATERIAL FACTS 2
STATEMENT OF PRECISE RELIEF REQUESTED 2
THRESHOLD REQUIREMENT FOR *INTER PARTES* REVIEW 3
STATEMENT OF REASONS FOR RELIEF REQUESTED 3

I. Introduction to the Technology of the '077 patent 3

II. Independent Claim 1 of the '077 Patent 4

III. Construction of the Claims 4
- **i. "On a Surface" (Claims 23 and 25)** 5
- **ii. "Insulative Shield" (Claims 1, 2, 6, 13, 14, 23, 24, 28, 35, and 36)** 6
- **iii. "Ceramic" (Claims 2, 14, 24, and 36)** 7
- **iv. "Co-bonding" or "co-bonds" (Claims 6, 13, 28, and 35)** 8
- **v. "Wherein the insulative shield protects the surface of the feedthrough capacitor from heat, splatter or debris occasioned by said coupling of the electronic circuitry to the terminal pin or leadwire" (Claims 1, 13, 23, and 35)** 9
- **vi. "By laser welding, thermal or ultrasonic bonding, soldering, or brazing" (Claims 31 and 35)** 12
- **vii. "Thermal Bonding" (Claims 9, 13, 31, and 35)** 14

IV. Claim-By-Claim Explanation of Grounds for Unpatentability 14

Ground 1. Engmark in view of Kurihara and Stevenson '095 renders Claims 1, 2, 6-9, 13, 14, 18, 19, 23, 24, 28-31, 35, 36, 40, and 41 unpatentable. 15
- **i. Independent Claims 1, 13, 23, and 35** 15
- **ii. Dependent Claims 2, 6-9, 14, 18, 19, 24, 28-31, 36, 40, and 41** 26
- **iii. Reasons to Combine Engmark with Kurihara and Stevenson '095** 30

Ground 2. A first embodiment of Stevenson '347 anticipates Claims 1, 2, 6-9, 13, 14, 18, 19, 23, 24, 28-31, 35, 36, 40, and 41.....34
i. Independent Claims 1 and 13 34
ii. Independent Claims 23 and 35 41
iii. Dependent Claims 2, 6-9, 14, 18, 19, 24, 28-31, 36, 40, and 4147
Ground 3. A second embodiment of Stevenson '347 anticipates Claims 1, 2, 8, 9, 23, 24, 30, and 31.....51
i. Independent Claims 1 and 23 51
ii. Dependent Claims 2, 8, 9, 24, 30, and 31.....58

CONCLUSION.....60

EXHIBIT LIST

Ex. #	Exhibit
1001	U.S. Patent No. 7,035,077 ("'077 Patent")
1002	Declaration of Mr. Pedro Irazoqui
1003	U.S. Patent No. 6,985,347 ("Stevenson '347")
1004	U.S. Patent Application Publication No. 2003/0040779 ("Engmark")
1005	U.S. Patent Application Publication No. 2004/0130849 ("Kurihara")
1006	Image File Wrapper for '077 Patent
1007	Curriculum Vitae of Mr. Pedro Irazoqui
1008	THE AMERICAN HERITAGE COLLEGE DICTIONARY (4th ed. 2004)
1009	Merriam Webster's Collegiate Dictionary (10th ed. 1997)
1010	U.S. Patent No. 5,333,095 ("Stevenson '095")
1011	U.S. Patent No. 5,751,539
1012	U.S. Patent No. 5,905,627
1013	Ivan G. Sarda & William H. Payne, *Ceramic EMI Filters: A Review*, 67 Ceramic Bulletin 737 (1988) (published by the American Ceramic Society)
1014	MCGRAW-HILL DICTIONARY OF SCIENTIFIC AND TECHNICAL TERMS (2003)
1015	Advanced Ceramic Technologies & Products, Y. Imanaka et al. (2012)
1016	ROBERT K. BARNHART, HAMMOND BARNHART DICTIONARY OF SCIENCE (Sol Steinmetz ed., 1986)
1017	NATIONAL INSTITUTE OF INDUSTRIAL RESEARCH BOARD OF CONSULTANTS & ENGINEERS, THE COMPLETE BOOK ON GLASS AND CERAMICS TECHNOLOGY
1018	Peng Wang, *The General Properties and Applications of Ceramic Materials*, *in* APPLIED MECHANICS AND MATERIALS, Vols. 174-177 (2012)

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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 '077 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

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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 '077 patent is May 10, 2004. (*See* Ex. 1001.) U.S. Patent No. 6,985,347 ("Stevenson '347," Ex. 1003) has an effective filing date of at least February 28, 2002 and is at least § 102(e) prior art to the claims of the '077 patent. U.S. Patent Application Publication No. 2003/0040779 ("Engmark," Ex. 1004) has a publication date of February 27, 2003 and is at least § 102(b) prior art to the claims of the '077 patent. U.S. Patent Application Publication No. 2004/0130849 ("Kurihara," Ex. 1004) has a filing date of November 13, 2003 and is at least § 102(e) prior art to the claims of the '077 patent. U.S. Patent No. 5,333,095 ("Stevenson '095," Ex. 1010) has a patent grant date of July 26, 1994 and is at least § 102(b) prior art to the claims of the '077 patent.

STATEMENT OF PRECISE RELIEF REQUESTED

The Petitioner respectfully requests the Board initiate an *inter partes* review and cancel Claims 1, 2, 6-9, 13, 14, 18, 19, 23, 24, 28-31, 35, 36, 40, and 41 of the '077 patent as unpatentable pursuant to 35 U.S.C. § 311(b) based on the following three 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, 2, 6-9, 13, 14, 18, 19, 23, 24, 28-31, 35, 36, 40, and 41 of the '077 patent are taught in the prior art as explained below in the proposed grounds of unpatentability. Also, the reasons to combine 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 '077 patent

The '077 patent is directed to "electromagnetic interference (EMI) feedthrough terminal assemblies, and related methods of construction, designed to decouple and shield undesirable electromagnetic interference signals from associated active implantable medical devices." (Col. 1, ll. 9-13; *see also*, Abstract.) The '077 patent purports to provide an "insulative shield" over a "ceramic capacitor" that "provides protection against damage and degradation of the feedthrough capacitor and/or its conformal coating from heat, splatter or debris resulting from the electromechanical connection of components during construction." (Abstract.)

II. Independent Claim 1 of the '077 Patent

The "process for manufacturing a feedthrough terminal assembly" of Claim 1 includes "associating a feedthrough capacitor with a conductive ferrule," "passing a terminal pin or leadwire through the ferrule" and "through the feedthrough capacitor," "placing an insulative shield over a surface of the feedthrough capacitor," and "conductively coupling electronic circuitry … to the terminal pin or leadwire." (Ex. 1001). As shown in Figs. 2-4, insulative shield 28 is placed over a feedthrough capacitor 30. (Col. 4, l. 56 – col. 5, l. 45.)

The insulative shield 28 may include any of a variety of insulative materials such as ceramic or non-ceramic materials, polyimides, cyanate esters, BY epoxies, alumina, alumina ceramic, alumina-oxide, Fosterite, berrylia, aluminum nitride, printed circuit board materials, rein reinforced by a fabric cloth, epoxy, fiberglass, and various other similar materials. (S*ee* col. 5, l. 61 – col. 6, l. 42; claims 2-5.)

III. 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. "On a Surface" (Claims 23 and 25)

The phrase "on a surface" appears at least in each of independent Claims 23 and 35. In Claim 23, the phrase is used in the context of the "insulative shield [being] on a surface of the feedthrough capacitor." The '077 patent mentions the phrase "over the surface" in the summary section at column 3, lines 17-18 of the '077 patent (which simply restates the element from claim 1) and the phrase "over the top surface" at column 6, lines 66-67 of the '077 patent. However, the specification of the '077 patent does not explicitly define the term "on a surface." The proper claim construction of "on a surface" is "over a surface," as recited in independent Claims 1 and 13. (Ex. 1002 at 13-14.)

With respect to the insulative shield being "over" or "on" a surface of the capacitor, the '077 patent indicates that the "insulative shield 28" is positioned over a surface of the "feedthrough capacitor 30." (*See* Figs. 3 and 4.) Further, the '077 patent states that the "insulative shield 28 protects the top surface of the feedthrough capacitor 30. Specifically, the insulative shield 28 protects the conformal coating 46 on the top surface of the feedthrough capacitor 30." (Col. 5, lines 37-42.) Thus, the '077 patent implies that the "insulative shield" does not

necessarily touch the "feedthrough capacitor." (*See also* Figs. 3 and 4.) Indeed, "on a surface" does not mean on and in direct contact with a surface of the feedthrough capacitor because dependent Claim 28 and independent Claim 35 indicate that a "conformal coating" is located between the "insulative shield" and the "feedthrough capacitor." (Ex. 1002 at 13-14.) For example, Claim 28 recites "a conformal coating on the feedthrough capacitor, wherein the conformal coating co-bonds the insulative shield," and independent Claim 35 recites similar elements. Thus, if the conformal coating co-bonds the insulative shield to the feedthrough capacitor, then the conformal coating is positioned between the insulative shield and the feedthrough capacitor. (*See* Figs. 3 and 4.) Accordingly, the proper claim construction of "on a surface" is "over a surface." (*See* Ex. 1002 at 13-14.)

ii. "Insulative Shield" (Claims 1, 2, 6, 13, 14, 23, 24, 28, 35, and 36)

The phrase "insulative shield" appears at least in each of Claims 1, 2, 6, 13, 14, 23, 24, 28, 35, and 36. In Claim 1, the phrase is used in the context of "placing an insulative shield over a surface of the feedthrough capacitor" and that "the insulative shield protects the surface of the feedthrough capacitor from heat, splatter or debris." The '077 patent describes the "insulative shield" as being many different things, including "ceramics, polyimides, cyanate esters and BT epoxies" (col. 5, lines 62-63), "ceramic or non-ceramic materials" (col. 5, line 64), "alumina

ceramic" (col. 6, line 2), "alumina-oxide, Fosterite, alumina in various purities, berrylia and aluminum nitride" (col. 6, lines 9-11), "[n]on-ceramic printed circuit board materials" including "resin reinforced by a fabric cloth," "[e]poxy (FR-4), polyimide and cyanate ester," and fiberglass (col. 6, lines 21-26), and "polyimides, modified polyimides, cyanate esters, BT epoxies, composite epoxies, multifunctional epoxies, tetra-functional epoxies, modified FR-4s and standard FR-4s" (col. 6, lines 39-42). The various materials listed for the "insulative shield" share the property of being insulators. Thus, one of ordinary skill in the art would have understood the term "insulative" to refer to a shield that is insulative. (Ex. 1002 at 14-15.) The "insulative shield" is located between the "feedthrough capacitor" and the "heat, splatter or debris 44 [that] can have a damaging or degrading effect on the feedthrough capacitor 30." (*See* col. 5, lines 31-45; *see also* Fig. 3.) The "insulative shield" can "prevent[ ] [heat, splatter, or debris 44] from reaching the feedthrough capacitor 30." (Col. 5, lines 43-44.) Thus, the proper broadest reasonable construction of "insulative shield" in the '077 patent is an insulating material capable of shielding a surface from heat, splatter, and/or debris. (*See* Ex. 1002 at 14-15.)

iii. "Ceramic" (Claims 2, 14, 24, and 36)

The term "ceramic" appears at least in each of dependent Claims 2, 14, 24, and 36. In Claim 2, the term is used in the context that the "insulative shield comprises

… ceramic." The '077 patent does not explicitly define "ceramic," but states that "[f]or ceramic substrates, the scribe characteristics of the ceramic materials is important so that the individual substrates of the present invention can be cut or snapped out of a larger production array of said substrates." (Col. 6, lines 16-20.) A person of ordinary skill in the art would recognize that a "ceramic" is a non-metallic, inorganic solid. (Ex. 1002 at 15; Ex. 1015 at 7; Ex. 1016 at 256; Ex. 1017 at 527-528; Ex. 1018 at Abstract, 216 (last paragraph).) Accordingly, the proper construction of "ceramic" is a non-metallic, inorganic solid.

iv. "Co-bonding" or "co-bonds" (Claims 6, 13, 28, and 35)

The term "co-bonding" appears at least in each of Claims 6 and 13, and the term "co-bonds" appears at least in each of Claims 28 and 35. In Claim 6, the term "co-bonding" is used in the context of "co-bonding the insulative shield to the feedthrough capacitor using a conformal coating." In Claim 28, the term "co-bonds" is used in the context of "the conformal coating co-bonds the insulative shield to the feedthrough capacitor." The '077 patent does not define the term "co-bonding" or the term "co-bonds."

A "bond" is a "substance or an agent that causes two or more objects or parts to cohere" or a "union or cohesion brought about by such a substance or agent." (Ex. 1008 at pg. 163.) The prefix "co-" means "[t]ogether; joint; jointly; mutually." (*Id.* at pg. 274.) Thus, the dictionary definition of the term "co-bonding" is

causing two or more objects to cohere together. The ’077 patent supports such a meaning. For example, the ’077 patent states “a thin substrate or insulative shield [is] co-bonded to the top surface of a feedthrough capacitor in a feedthrough filter assembly” and that the “insulative shield is co-bonded using the capacitor's own conformal coating material.” (Col. 4, lines 14-20.) In addition, the ’077 patent indicates that the conformal coating can be used to “co-bond” the insulative shield to the feedthrough capacitor. (*See* col. 5, lines 6-8.) In one example, the conformal coating can be a washer with supportive tape adhesive. (’077 patent; col. 2, lines 40-43; col. 5, lines 47-49.) Thus, a washer with adhesive tape can “co-bond” the insulative shield to the feedthrough capacitor in that the insulative shield and the feedthrough capacitor are caused to cohere together via the washer with adhesive tape. Accordingly, the proper claim construction of the term “co-bonding” is causing two or more objects to cohere together. (*See* Ex. 1002 at 15-16.)

v. “Wherein the insulative shield protects the surface of the feedthrough capacitor from heat, splatter or debris occasioned by said coupling of the electronic circuitry to the terminal pin or leadwire” (Claims 1, 13, 23, and 35)

The phrase “wherein the insulative shield protects the surface of the feedthrough capacitor from heat, splatter or debris occasioned by said coupling of the electronic circuitry to the terminal pin or leadwire” appears at least in each of

independent Claims 1, 13, 23, and 35. The phrase merely recites an intended use of the "insulative shield" and, therefore, should not be given patentable weight beyond the claim construction for the phrase "insulative shield" discussed above, i.e., "an insulating material capable of shielding a surface from heat, splatter, and/or debris." (*See* Ex. 1002 at 14-16.)

"Claim scope is not limited by claim language that suggests or makes optional but does not require steps to be performed." MPEP § 2111.04. An element of a method claim that "is [ ] functional, describing a result only, and not a process" has no patentable weight. *In re Fuller*, 35 F.2d 62 (CCPA 1929).

With respect to apparatus Claims 23 and 35, "claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function." MPEP § 2114. "[A]pparatus claims cover what a device *is*, not what a device *does*." *Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 909 F.2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990) (emphasis in original). "A claim containing a 'recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus' if the prior art apparatus teaches all the structural limitations of the claim." MPEP § 2114(II) (citing *Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987)). A claim element that describes how an apparatus should be used to achieve the desired result is not given patentable weight because an

apparatus claim is differentiated from the prior art by structure alone. *Ex Parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Interf. 1987) ("The apparatus disclosed [ ] does not undergo a metamorphosis to a new apparatus merely by affixing instructions thereto indicating" how to use the apparatus.).

Functional language has long been ignored by courts. *See, e.g., General Electric Co. v. Wabash Appliance Co.*, 304 U.S. 364, 371-72 (1938) ("But the vice of a functional claim exists not only when a claim is 'wholly' functional, if that is ever true, but also when the inventor is painstaking when he recites what has already been seen [observed by the inventor as the novel feature], and then uses conveniently functional language at the exact point of novelty. … [A] characteristic essential to novelty may not be distinguished from the old art solely by its tendency to remedy the problems in the art met by the patent."); *In re Fuller*, 35 F.2d 62 (CCPA 1929) ("It [the claimed element] is also functional, describing a result only, and not a process, and can, therefore, have no standing here."). Although there is "nothing intrinsically wrong with" using functional claim language, if a claim element merely recites the outcome of a step (rather than a step itself) or what a structure does (rather than the structure itself), such an element should be ignored. *See In re Swineheart*, 439 F.2d 210, 212-13 (CCPA 1971).

Accordingly, the phrase "wherein the insulative shield protects the surface of the feedthrough capacitor from heat, splatter or debris occasioned by said coupling of the electronic circuitry to the terminal pin or leadwire" should not be given any patentable weight beyond the above-referenced claim construction for the phrase "insulative shield," i.e., "an insulating material capable of shielding a surface from heat, splatter, and/or debris." In method Claims 1 and 13, the phrase does not recite a step to be performed, but merely describes the result of a previously recited step (e.g., "placing an insulative shield over a surface of the feedthrough capacitor" and "conductively coupling electronic circuitry"), and, therefore, deserves no patentable weight. In apparatus Claims 23 and 35, the phrase recites no structure, nor adds any structural limitations to the previously recited elements (e.g., "an insulative shield on a surface of the feedthrough capacitor") and, therefore, deserves no patentable weight.

vi. "By laser welding, thermal or ultrasonic bonding, soldering, or brazing" (Claims 31 and 35)

The phrase "by laser welding, thermal or ultrasonic bonding, soldering, or brazing" appears at least in each of Claims 31 and 35. The phrase is used in the context that "the electronic circuitry is conductively coupled to the terminal pin or leadwire by laser welding, thermal or ultrasonic bonding, soldering, or brazing." The words "welding," "bonding," "soldering," and "brazing" are verbs

and, therefore, define a process. Because Claims 31 and 35 are directed to apparatuses, the phrase which describes a process, is a product-by-process element. *See* MPEP § 2173.05(p). However, in a patentability analysis, such process elements are not given patentable weight. *See id.* ("[I]t [must be] clear that the claim is directed to the product and not the process."). Rather, only the structure resulting from the process is given patentable weight. *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."). Accordingly, the phrase "by laser welding, thermal or ultrasonic bonding, soldering, or brazing" does not deserve any patentable weight, because it merely describes the process by which the electronic circuitry is conductively coupled to the terminal pin or leadwire. The phrase does not add any structure to the claimed apparatus. (Ex. 1002 at 16-17.)

vii. "Thermal Bonding" (Claims 9, 13, 31, and 35)

The phrase "thermal bonding" appears at least in each of Claims 9, 13, 31, and 35. In Claim 9, the phrase is used in the context that "the conductive coupling comprises laser welding, thermal or ultrasonic bonding, soldering, or brazing." The phrase is used in a similar context in Claims 31 and 35, i.e., in a manner intended to define conductively coupling. In Claim 13, the phrase is used in the context of "laser welding, thermal or ultrasonic bonding, soldering, or brazing electronic circuitry." The term "thermal bonding" is not specifically defined in the specification of the '077 patent. One of skill in the art would understand "thermal bonding" to be a method of adhering firmly using heat. (Ex. 1002 at 17.) A dictionary definition of "bonding" is "to cause to adhere firmly." (Ex. 1009 at pg. 130.) A dictionary definition of "thermal" is "[o]f, relating to, using, producing, or caused by heat." (Ex. 1008 at 1430.) Thus, in the context of "conductive coupling," the proper construction of "thermal bonding" is a method of adhering firmly using heat.

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

Please note that, to reduce redundancy, various claim elements from different claims are discussed together. In an effort to be as complete as possible, the declaration by Dr. Irazoqui discusses each claim individually. Accordingly, various citations in this petition that support an assertion applied to multiple claims

may refer to various portions of the declaration that each respectively discuss a specific one of the multiple claims.

Ground 1. Engmark in view of Kurihara and Stevenson '095 renders Claims 1, 2, 6-9, 13, 14, 18, 19, 23, 24, 28-31, 35, 36, 40, and 41 unpatentable.

Claims 1, 2, 6-9, 13, 14, 18, 19, 23, 24, 28-31, 35, 36, 40, and 41 of the '077 patent are unpatentable under 35 U.S.C. § 103(a) over U.S. Patent Application Publication No. 2003/0040779 ("Engmark") in view of U.S. Patent Application Publication No. 2004/0130849 ("Kurihara") and further in view of U.S. Patent No. 5,333,095 ("Stevenson '095"). Engmark and Stevenson '095 were each published more than a year before the effective filing date of the '077 patent and are prior art under 35 U.S.C. § 102(b). Kurihara was filed before the effective filing date of the '077 patent and is prior art at least under 35 U.S.C. § 102(e). Each of the limitations of Claims 1, 2, 6-9, 13, 14, 18, 19, 23, 24, 28-31, 35, 36, 40, and 41 are rendered obvious by Engmark, Kurihara, and Stevenson '095 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.)

i. Independent Claims 1, 13, 23, and 35

Independent Claims 1 and 13 are each directed to a "process for manufacturing a feedthrough terminal assembly for an active implantable medical device," which is shown at least in Figs. 3 and 41 of Engmark. (Ex. 1002 at 23, 39.) The claimed

"process[es]" include "associating a feedthrough capacitor with a conductive ferrule, the feedthrough capacitor having first and second sets of electrode plates." Independent Claims 23 and 35 are each directed to a "feedthrough terminal assembly for an active implantable medical device," which is shown also at least in Figs. 3 and 41 of Engmark. (Ex. 1002 at 55, 70.) The claimed "feedthrough terminal assembl[ies]" include "a feedthrough capacitor having first and second sets of electrode plates."

Engmark discloses a "feedthrough 135" that includes a "capacitor section 142" and that is associated with a "ferrule wall 139." (Fig. 41; paragraphs [0096] and [0097]; Ex. 1002 at 23-24, 39-40, 55-56, 70-71.) For convenience, Fig. 41 of Engmark is reproduced below:

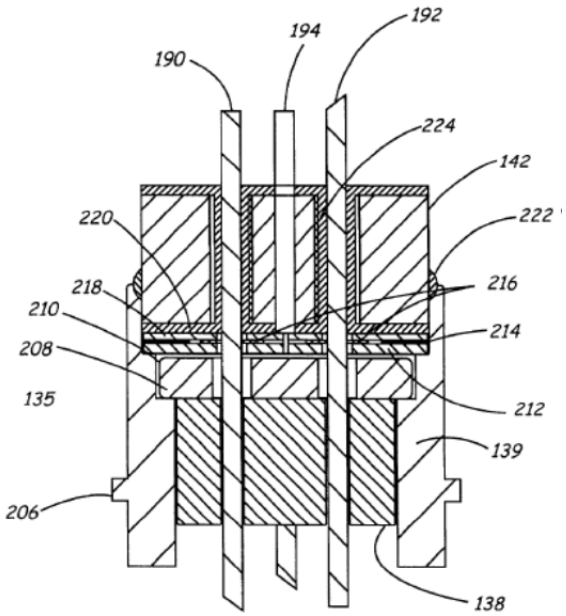

FIG. 41

"Capacitor 142" is a "feedthrough capacitor" at least in that "capacitor 142" is part of "feedthrough 135" and "encompass[es] conductive pins … and form[s] [a] capacitive filter[ ] that reduce[s] the effects of electromagnetic interference on the signals carried by the pins." (Engmark; paragraph [0091]; Exhibit 1002 at 23-24, 39-40, 55-56, 70-71.) Accordingly, a person of skill in the art would recognize that "capacitor 142" of Engmark is equivalent to the claimed "feedthrough capacitor" and is "associat[ed]" with a "conductive ferrule" (e.g., "ferrule wall 139") as recited in each of independent Claims 1, 13, 23, and 35. (Ex. 1002 at 23-24, 39-40, 55-56, 70-71.)

The "capacitor 142" of Engmark is a discoidal capacitor that filters electromagnetic interference. (Paragraph [0096].) One of skill in the art would readily recognize that such a discoidal capacitor includes first and second sets of electrode plates. (Ex. 1002 at 24-25, 40-41, 56, 71-72.) However, Engmark does not explicitly state that discoidal "capacitor 142" includes first and second sets of electrode plates. Similar to Engmark, Stevenson '095 discloses a discoidal feedthrough filter capacitor used for filtering electromagnetic interference in implantable medical devices. (*See* Abstract; col. 5, lines 9-18; Figs. 2, 5, and 6; Ex. 1002 at 25-26, 41-42, 57-58, 72-73.) Specifically, Stevenson '095 states that the "filter capacitor 24 comprises, in the form shown in FIGS. 2, 5 and 6, a

discoidal capacitor having first and second sets of electrode plates 40 and 42 embedded within an insulative or dielectric base structure 44 of ceramic monolith construction or the like." (Col. 6, lines 30-34; *see also* Fig. 2; Ex. 1002 at 25-26, 41-42, 57-58, 72-73.) It would have been obvious to use a discoidal capacitor having first and second sets of plates which are respectively conductively coupled to the terminal pin and the ferrule as taught in Stevenson '095 for the discoidal capacitor 142 of Engmark since such a substitution would have resulted in the predictable use of a discoidal capacitor as known to those of skill in the art. (Ex. 1002 at 26, 42, 58, 73.) Thus, Engmark, alone or in combination with Stevenson '095, discloses a "feedthrough capacitor having first and second sets of plates," as recited in Claims 1, 13, 23, and 35.

Independent Claims 1, 13, 23, and 35 of the '077 patent further recite that "the second set of electrode plates is conductively coupled to [a] conductive ferrule." One set of electrode plates of "capacitor 142" of Engmark is "conductively coupled" to the "ferrule wall 139" in order to create a capacitance between the pins 190, 192 and the "ferrule wall 139." (Paragraphs [0096] and [0097]; Ex. 1002 at 26-27, 42-43, 58-59.) In addition, Stevenson '095 discloses a set of "electrode plates 42" that are conductively coupled to "ferrule 28." *See* Figs. 2, 5, 6; col. 4, lines 20-26; col. 6, lines 57-64; col. 7, lines 28-32; Ex. 1002 at 27, 43, 59.)

Claims 1 and 13 further recite "passing a terminal pin or leadwire through the ferrule in non-conductive relation and through the feedthrough capacitor in conductive relation with the first set of electrode plates." Claims 23 and 35 similarly recite "a terminal pin or leadwire passing through the ferrule in non-conductive relation and through the feedthrough capacitor in conductive relation with the first set of electrode plates." Engmark discloses passing "pins 190, 192" through the ferrule 139 in "non-conductive relation" with the ferrule 139. (*See* Fig. 41; Ex. 1002 at 27-28, 44, 59-60, 75-76.) One of ordinary skill in the art would readily recognize that the "pins 190, 192" of Engmark are in "non-conductive relation" with the ferrule 139 at least in view of the presence of "glass 208," "seal section 138," and "layer 210," which collectively insulatively separate the "pins 190, 192" from the ferrule 139. (Fig. 41; paragraph [0097]; Ex. 1002 at 28, 44, 59-60, 75-76.) In addition, the "pins 190, 192" in Engmark could not be in conductive relation with the ferrule 139, since such a connection would short the "pins 190, 192" to the ferrule 139 and destroy the functionality of the feedthrough assembly of Engmark. (Ex. 1002 at 28, 44, 60, 76.) One of skill in the art would further recognize that the "pins 190, 192" of Engmark are in "conductive relation" with a set of electrode plates of "capacitor 142." (*See* paragraph [0096]; Ex. 1002 at 28, 44, 60, 75.)

Claims 1 and 13 of the ’077 patent also recite “placing an insulative shield over a surface of the feedthrough capacitor.” Claims 23 and 35 of the ’077 patent similarly recite “an insulative shield on a surface of the feedthrough capacitor.” Engmark discloses a conformal coating (e.g., nonconductive epoxy 220) that is placed on both sides of the feedthrough capacitor 142, including on the electronics side (e.g., on the side of the capacitor 142 facing the interior of the housing of the implantable medical device where the electronics of the device are located). (*See* Figs. 29 and 41; paragraph [0089]; Ex. 1002 at 29, 45, 60, 76.) Engmark additionally discloses various washers 212, 214, 216, and 218, a glass layer 208, and a seal section 138 that are all located on the body-side of the capacitor 142 (e.g., on the side of the capacitor 142 facing away from the interior of the housing of the implantable medical device). (*See* Figs. 28, 29, and 41; paragraphs [0096] and [0097]; Ex. 1002 at 29, 45, 60, 76.) Engmark does not explicitly disclose placing an insulative shield over the nonconductive epoxy 220 at the electronics side of the feedthrough capacitor 142.[1]

[1]Petitioner notes that there is substantial overlap between the structure and materials of a “conformal coating” and an “insulative shield” as described in the ‘077 patent. Because Engmark does not explicitly disclose the functional

Kurihara discloses a "protective insulating layer 16 made of for example a polyimide resin [that] is formed over the barrier layer 15." (Paragraph [0128]; Ex. 1002 at 30, 46, 62, 77.) The purpose of the polyimide "protective insulating layer 16" of Kurihara is to protect the "capacitor 30" from harmful effects produced by heat. (*See* paragraph [0016]; Ex. 1002 at 30, 46, 62, 77.) One of ordinary skill in the art would understand that Kurihara discloses applying a polyimide protective insulating layer (i.e., an "insulating shield") to help prevent heat from soldering electrical connections reaching the capacitor. (Ex. 1002 at 31, 47, 62, 78.) Indeed, the protective insulating layer of Kurihara consists of the same material (i.e., polyimide) as an exemplary insulative shield in the '077 patent. (*See* Kurihara, paragraph [0017]; '077 patent, col. 5, ll. 61-62; Ex. 1002 at 31.) It would have been obvious to one of ordinary skill in the art with the teachings of Engmark and Kurihara to add an insulative shield as taught in Kurihara (e.g., a polyimide protective insulating layer or other material with equivalent insulative and heat protective properties) over a surface of the feedthrough capacitor 142 of Engmark on its electronics side to protect the feedthrough capacitor 142 from heat, splatter or debris occasioned by coupling of electronic circuitry (e.g., 44). (Ex.

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characteristics of nonconductive epoxy 220 that would cause it to correspond to the claimed insulative shield, Petitioner treats it here as a conformal coating.

1002 at 31, 47, 62, 78.) Accordingly, a person of skill in the art would understand the combination of Engmark and Kurihara to teach "placing an insulative shield over a surface of the feedthrough capacitor" as recited in Claims 1 and 13, and "an insulative shield on a surface of the feedthrough capacitor" as recited in Claims 23 and 35. (*Id*.)

Claim 1 further recites "conductively coupling electronic circuitry for the active implantable medical device to the terminal pin or leadwire." Claim 13 recites "laser welding, thermal or ultrasonic bonding, soldering, or brazing electronic circuitry for the active implantable medical device to the terminal pin or leadwire." Claims 23 and 35 further recite "electronic circuitry for the active implantable medical device conductively coupled to the terminal pin or leadwire." Engmark discloses that "pins 146, 148/190, 192" are conductively coupled to "circuit assembly 44" via "circuit elements 152, 154" inside the housing of an active implantable medical device. (*See* Figs. 30 and 41; paragraphs [0091] and [0096]; Ex. 1002 at 32-33, 50-51, 63-64, 81-82.) As would be apparent to one of skill in the art, the reference numerals "146, 148" in Engmark refer to the same pins as reference numerals "190, 192." (Ex. 1002 at 32-33, 50-51, 63-64, 81-82.) Engmark further states that electrical connections can be made via "parallel gap or ribbon welding" and that "[p]ins 190, 192, 194 can be welded to corresponding contact elements using automated welding techniques." (Paragraphs [0091] and

[0096]; Ex. 1002 at 32-33, 51-52, 63-64, 82-83.) Accordingly, one of skill in the art would understand Engmark to disclose that thermal bonding (i.e., adhering firmly using heat) is used to create electrical connections, including electrically connecting a terminal pin or leadwire (e.g., 146, 148/190, 192) with electronic circuitry. (Ex. 1002 at 51, 82-83.) Thus, one of skill in the art would understand Engmark to disclose "conductively coupling electronic circuitry for the active implantable medical device to the terminal pin or leadwire," as recited in Claim 1, "laser welding, thermal or ultrasonic bonding, soldering, or brazing electronic circuitry for the active implantable medical device to the terminal pin or leadwire," as recited in Claim 13," and "electronic circuitry for the active implantable medical device conductively coupled to the terminal pin or leadwire," as recited in Claims 23 and 35.

Engmark does not explicitly disclose forming electrical connections by soldering or brazing. However, Stevenson '095 discloses conductively coupling the "terminal pin 12" to electronic circuitry (e.g., a capacitor) by a "conductive adhesive bead 54, or by soldering or brazing or the like." (*See* col. 7, lines 21-24.) It would have been obvious to substitute such conductive coupling by soldering or brazing as disclosed in Stevenson '095 for the welding disclosed in Engmark. (Ex. 1002 at 52, 83.)

Claim 35 additionally recites that the "electronic circuitry [is] conductively coupled" by "laser welding, thermal or ultrasonic bonding, soldering, or brazing." As discussed in the Claim Construction above (*see* section III(vi)), this phrase recites a process element in an apparatus claim, and therefore, should not be given patentable weight. The phrase "by laser welding, thermal or ultrasonic bonding, soldering, or brazing" merely describes the process by which the electronic circuitry is conductively coupled to the terminal pin or leadwire. The phrase does not add any structure to the claimed apparatus. In the event the Board does apply patentable weight to such claim elements, Engmark and Stevenson '095 disclose that the "electronic circuitry [is] conductively coupled" by "laser welding, thermal or ultrasonic bonding, soldering, or brazing," as recited in Claim 35, for at least the reasons discussed above with respect to the similar claim language in Claim 13.

Claims 1, 13, 23, and 35 further recite that "the insulative shield protects the surface of the feedthrough capacitor from heat, splatter or debris occasioned by said coupling of the electronic circuitry to the terminal pin or leadwire." As discussed in the Claim Construction above (*see* section III(v)), this phrase merely recites an intended use and, therefore, should not be given patentable weight.

In addition, in the event the Board does apply patentable weight to this phrase, Kurihara discloses that the "insulative shield protects the surface of the feedthrough capacitor from heat, splatter or debris occasioned by said coupling of

the electronic circuitry to the terminal pin or leadwire." (Ex. 1002 at 33, 52-53, 64, 84.) Kurihara specifically indicates that a polyimide protective insulating layer protects a capacitor from the harmful effects of heat. (*See* paragraphs [0016] and [0017]; Ex. 1002 at 34, 52-53, 65, 84.)

Claim 13 further recites "co-bonding the insulative shield to the feedthrough capacitor using a conformal coating on the feedthrough capacitor." Similarly, Claim 35 recites "a conformal coating on the feedthrough capacitor, wherein the conformal coating co-bonds the insulative shield to the feedthrough capacitor." Engmark discloses a "nonconductive epoxy 220" that is equivalent to the claimed "conformal coating." (*See* Fig. 41; paragraph [0097]; Ex. 1002 at 48, 79.) Indeed, one of skill in the art would recognize that the "nonconductive epoxy 220" consists of a same material (i.e., a nonconductive polymer) as an exemplary embodiment of the "conformal coating" in the '077 patent. (*See* Ex. 1002 at 37, 68; Ex. 1014 at 732; '077 patent, claim 7.) The "nonconductive epoxy 220" of Engmark is disposed on both sides of "capacitor 142." (*See* Fig. 41; paragraph [0089]; Ex. 1002 at 48, 79.)

Engmark does not explicitly disclose co-bonding the insulative shield to the feedthrough capacitor using "nonconductive epoxy 220" on the feedthrough capacitor. However, it would have been obvious to one of skill in the art to co-bond the insulative shield (e.g., a polyimide protective insulating layer as disclosed

in Kurihara) to the feedthrough capacitor (e.g., 142) using a conformal coating (e.g., 220) on the feedthrough capacitor (e.g., 142) with the motivation supplied by Kurihara to protect the feedthrough capacitor (e.g., 142) from heat. (Ex. 1002 at 49-50, 80-81; Kurihara, paragraphs [0016] and [0017].) Indeed, Engmark indicates that the "nonconductive epoxy 220" may be used to co-bond a polyimide (e.g., "polyimide platform washer 218") to "capacitor 142." (*See* paragraph [0097]; Ex. 1002 at 49, 81.) As such, Engmark and Kurihara render obvious "co-bonding the insulative shield to the feedthrough capacitor using a conformal coating on the feedthrough capacitor," as recited in Claim 13, and "a conformal coating on the feedthrough capacitor, wherein the conformal coating co-bonds the insulative shield to the feedthrough capacitor," as recited in Claim 35.

For at least the reasons discussed above, Engmark, in combination with Kurihara and Stevenson '095, renders obvious each of independent Claims 1, 13, 23, and 35.

ii. Dependent Claims 2, 6-9, 14, 18, 19, 24, 28-31, 36, 40, and 41

Engmark in combination with Kurihara and Stevenson '095 also renders obvious the features of each of dependent Claims 2, 6-9, 14, 18, 19, 24, 28-31, 36, 40, and 41. Claims 2, 14, 24, and 36 recite that "the insulative shield comprises a circuit board, ceramic, alumina-oxide, Fosterite, alumina, BT epoxy, berrylia alumina oxide, polyimide, modified polyimide, cyanate ester, composite epoxy,

multifunctional epoxy, tetra-functional epoxy, modified epoxy or standard epoxy." (Emphasis added.) Kurihara discloses that the "protective insulating layer" includes polyimide. (*See* paragraphs [0017] and [0137]; Ex. 1002 at 34, 53, 65, 84-85.)

Claim 6 further recites "co-bonding the insulative shield to the feedthrough capacitor using a conformal coating on the feedthrough capacitor." Claim 28 similarly recites "a conformal coating on the feedthrough capacitor, wherein the conformal coating co-bonds the insulative shield to the feedthrough capacitor." As discussed above with respect to Claims 13 and 35, Engmark discloses a "nonconductive epoxy 220" that is equivalent to the claimed "conformal coating" and that is applied to a surface of a circuit or electrical component such as "capacitor 142." (*See* Fig. 41; paragraph [0097]; Ex. 1002 at 34-35, 66-67.) Engmark does not explicitly disclose co-bonding the insulative shield to the feedthrough capacitor using "nonconductive epoxy 220" on the feedthrough capacitor. However, it would have been obvious to one of skill in the art to co-bond the insulative shield (e.g., a polyimide protective insulating layer similar to that disclosed in Kurihara) to the feedthrough capacitor (e.g., 142) using a conformal coating (e.g., 220) on the feedthrough capacitor (e.g., 142) with the motivation supplied by Kurihara to protect the feedthrough capacitor (e.g., 142) from heat. (Ex. 1002 at 36-37, 67-68; Kurihara, paragraphs [0016] and [0017].)

Indeed, Engmark indicates that the "nonconductive epoxy 220" may be used to bond a polyimide (e.g., "polyimide platform washer 218") to "capacitor 142." (*See* paragraph [0097]; Ex. 1002 at 36, 67.) As such, Engmark and Kurihara render obvious "co-bonding the insulative shield to the feedthrough capacitor using a conformal coating on the feedthrough capacitor," as recited in Claim 6, and "a conformal coating on the feedthrough capacitor, wherein the conformal coating co-bonds the insulative shield to the feedthrough capacitor," as recited in Claim 28.

Claims 7, 18, 29, and 40 recite that the "conformal coating comprises a non-conductive polymer, a thermal setting epoxy, or a polyimide." As discussed above, Engmark discuses a "nonconductive epoxy 220" that is analogous to the claimed "conformal coating." One of ordinary skill in the art would understand a "nonconductive epoxy" to be a "non-conductive polymer," as claimed. (*See* Ex. 1002 at 37, 54, 68, 85; Ex. 1014 at 732.)

Claims 8, 19, 30, and 41 recite that "the active implantable medical device comprises a cardiac pacemaker, an implantable defibrillator, a congestive heart failure device, a hearing implant, a cochlear implant, a neurostimulator, a drug pump, a ventricular assist device, an insulin pump, a spinal cord stimulator, an implantable sensing system, a deep brain stimulator, an artificial heart, an incontinence device, a vagus nerve stimulator, a bone growth stimulator, a gastric pacemaker, or a prosthetic device." Engmark discloses such elements, stating in

paragraph [0002] that an example of the implantable medical device 10 is an "implantable cardioverter/defibrillator (ICD)." (Ex. 1002 at 37.)

Claim 9 recites that the "conductive coupling comprises laser welding, thermal or ultrasonic bonding, soldering, or brazing." Similarly, Claim 31 recites that the "electronic circuitry is conductively coupled to the terminal pin or leadwire by laser welding, thermal or ultrasonic bonding, soldering, or brazing." Engmark discloses that "pins 146, 148/190, 192" are conductively coupled to "circuit assembly 44" via "circuit elements 152, 154" inside the housing of an active implantable medical device. (*See* Figs. 30 and 41; paragraphs [0091] and [0096]; Ex. 1002 at 38, 69-70.) Engmark further states that electrical connections can be made via "parallel gap or ribbon welding" and that "[p]ins 190, 192, 194 can be welded to corresponding contact elements using automated welding techniques." (Paragraphs [0091] and [0096]; Ex. 1002 at 38, 69-70.) Accordingly, one of skill in the art would understand Engmark to disclose that thermal bonding (i.e., adhering firmly using heat) is used to create electrical connections, including electrically connecting a terminal pin or leadwire (e.g., 146, 148/190, 192) with electronic circuitry. (Ex. 1002 at 38-39, 69-70.) Engmark does not explicitly disclose forming electrical connections by soldering or brazing. However, Stevenson '095 discloses conductively coupling the "terminal pin 12" to electronic circuitry (e.g., capacitor 142) by a "conductive adhesive bead 54, or by soldering

or brazing or the like." (*See* col. 7, lines 21-24.) It would have been obvious to substitute such conductive coupling by soldering or brazing as disclosed in Stevenson '095 for the welding disclosed in Engmark. (Ex. 1002 at 38-39, 70.) Thus, one of skill in the art would understand Engmark, alone or in combination with Stevenson '095, to disclose "conductive coupling comprises laser welding, thermal or ultrasonic bonding, soldering, or brazing," as recited in Claim 9, and "electronic circuitry is conductively coupled to the terminal pin or leadwire by laser welding, thermal or ultrasonic bonding, soldering, or brazing," as recited in Claim 31.

In addition, as discussed above, the phrase "by laser welding, thermal or ultrasonic bonding, soldering, or brazing" recited in Claim 31 is a process element in an apparatus claim and should not be given patentable weight. (*See* Claim Construction section III(vi) above.) The phrase "by laser welding, thermal or ultrasonic bonding, soldering, or brazing" merely describes the process by which the electronic circuitry is conductively coupled to the terminal pin or leadwire. The phrase does not add any structure to the claimed apparatus.

iii. Reasons to Combine Engmark with Kurihara and Stevenson '095

At least one rationale to support a conclusion that the aforementioned claims would have been obvious is that "a person of ordinary skill in the art would have been motivated to combine the prior art to achieve the claimed invention and that

there would have been a reasonable expectation of success." *DyStar Textilfarben GmbH & Co. Deutschland KG v. C.H. Patrick Co.*, 464 F.3d 1356, 1360 (Fed. Cir. 2006). Obviousness can be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so. *In re Kahn*, 441 F.3d 977, 986 (Fed. Cir. 2006). As indicated in Kurihara, a person of ordinary skill in the art would have been motivated to combine a protective insulating layer as disclosed in Kurihara with the device of Engmark to protect the "capacitor 142" from the effects of heat. (Kurihara; paragraphs [0016] and [0017]; Ex. 1002 at 31-32, 47-48, 62-63, 78-79.) A person of ordinary skill in the art would recognize the need for protecting capacitors from heat. (Ex. 1002 at 31, 47-48, 62-63, 78-79.)

The prior art can be modified or combined to reject claims as *prima facie* obvious as long as there is a reasonable expectation of success. *In re Merck & Co., Inc.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). At the time of the filing date of the '077 Patent, there was a reasonable expectation of success for combining the protective insulating layer of Kurihara with the device of Engmark. (Ex. 1002 at 31-32, 47-48, 62-63, 78-79.) For example, Engmark discloses a "nonconductive epoxy 220" that already bonds a polyimide (i.e., "polyimide platform washer 218") to the "capacitor 142." (Fig. 41; paragraph [0097].) Thus, there would have been a reasonable expectation of success for applying a polyimide protecting insulating

layer to the nonconductive epoxy 220 of Engmark. (Ex. 1002 at 31-32, 47-48, 62-63, 78-79.) For at least the reasons above, a person of ordinary skill in the art would have found it obvious to "combine the known elements" of a protective insulating layer or similar protective layer as that disclosed in Kurihara and the implantable medical device (including the capacitor 142) of Engmark.

It also would also have been obvious to a person of ordinary skill in the art to include multiple sets of electrode plates in the discoidal capacitor 142 of Engmark as disclosed in Stevenson '095. (Ex. 1002 at 26, 42, 57-58, 73.) Similarly, it would have been obvious to perform conductive coupling of electronic circuitry to a terminal pin in Engmark using soldering or brazing processes as disclosed in Stevenson '095. (Ex. 1002 at 38-39, 52, 69-70, 82-83.) Such modifications would merely have amounted to substituting one element for another known element in the same field. When considering obviousness of a combination of known elements, the operative question is "whether the improvement is more than the predictable use of prior art elements according to their established functions." See *KSR International Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1740 (2007). Indeed, "when a patent claims a structure already known in the prior art that is altered by the mere substitution of one element for another known in the field, the combination must do more than yield a predictable result." *Id*. (discussing the holding in *United States v. Adams*, 383 U.S. 39, 40 (1966)). Including multiple

sets of electrode plates in the discoidal capacitor 142 of Engmark would have resulted in the predictable use of prior art elements according to their established functions. (Ex. 1002 at 26, 42, 57-58, 73.) For example, the purpose of the discoidal capacitor 142 of Engmark is to filter electromagnetic interference. (Paragraph [0096]; claim 41.) The discoidal capacitor with first and second sets of plates as disclosed in Stevenson '095 similarly filters electromagnetic interference. (Col. 5, lines 9-18.) Thus, the inclusion of multiple sets of electrodes plates in the discoidal capacitor 142 of Engmark would have yielded a predictable result because the discoidal capacitor would have predictably filtered electromagnetic interference as disclosed in both Stevenson '095 and Engmark. (Ex. 1002 at 26, 42, 57-58, 73.)

In addition, substituting the soldering or brazing processes of Stevenson '095 for the welding processes of Engmark would have resulted in the predictable use of prior art elements according to their established functions. (Ex. 1002 at 38-39, 52, 70, 82-83.) For example, such a substitution would have been predictable since soldering and brazing are well known in the art for forming reliable electrical connections. (Ex. 1002 at 38-39, 52, 70, 82-83.)

Ground 2. A first embodiment of Stevenson '347 anticipates Claims 1, 2, 6-9, 13, 14, 18, 19, 23, 24, 28-31, 35, 36, 40, and 41.

Claims 1, 2, 6-9, 13, 14, 18, 19, 23, 24, 28-31, 35, 36, 40, and 41 of the '077 patent are unpatentable under 35 U.S.C. § 102(e) as anticipated by U.S. Patent No. 6,985,347 (hereinafter "Stevenson '347"). Stevenson '347 includes the same assignee as the '077 patent. Stevenson '347 was filed before the effective filing date of the '077 patent and is prior art at least under 35 U.S.C. § 102(e).

As discussed in detail below, in a first embodiment as disclosed generally in Fig. 43, Stevenson '347 discloses a "process for manufacturing a feedthrough terminal assembly" and a "feedthrough terminal assembly" including the features recited by each of Claims 1, 2, 6-9, 13, 14, 18, 19, 23, 24, 28-31, 35, 36, 40, and 41 of the '077 patent. (*See* Ex. 1002 at 94-135.)

i. Independent Claims 1 and 13

Independent Claims 1 and 13 are each directed to a "process for manufacturing a feedthrough terminal assembly for an active implantable medical device," which is shown in Fig. 43 of Stevenson '347. (Ex. 1002 at 93, 104.) For convenience, Fig. 43 of Stevenson '347 is reproduced below:

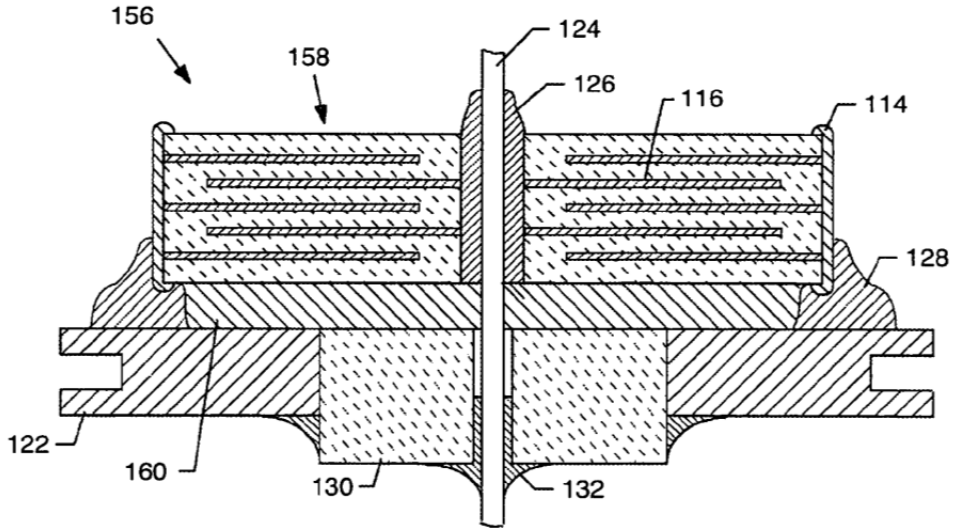

FIG. 43

The claimed "process[es]" include "associating a feedthrough capacitor with a conductive ferrule, the feedthrough capacitor having first and second sets of electrode plates." Stevenson '347 discloses a "feedthrough capacitor 158" that is associated with a "conductive ferrule 122." (Col. 19, ll. 52-56; Ex. 1002 at 94-95, 105.) The "feedthrough capacitor 158" includes "active electrodes 116" and "ground electrode plates 118." (Col. 15, ll. 34-35; col. 19, ll. 25-27; Ex. 1002 at 95, 105.) One of ordinary skill in the art would recognize that these "active electrodes 116" and "ground electrode plates 118" are "first and second sets of electrode plates," as claimed. (Ex. 1002 at 95, 105.) The "ground electrode plates 118" (which are analogous to the claimed "second set of electrode plates") are "conductively coupled to the ferrule," as recited in Claims 1 and 13. (Col. 19, ll. 15-20; col 20., ll. 12-15; Ex. 1002 at 96, 106.)

Claims 1 and 13 further recite "passing a terminal pin or leadwire through the ferrule in non-conductive relation and through the feedthrough capacitor in conductive relation with the first set of electrode plates." Stevenson '347 discloses passing a "lead wire or terminal pin 124" through the "conductive ferrule 122" in "non-conductive relation" with the "conductive ferrule 122." (*See* Fig. 43; Ex. 1002 at 96-97, 106-07.) One of ordinary skill in the art would readily recognize that the "lead wire or terminal pin 124" is in "non-conductive relation" with the "conductive ferrule 122" at least in view of the presence of an "insulator 130" that insulatively separates the "lead wire or terminal pin 124" from the "conductive ferrule 122." (Ex. 1002 at 96, 107.) In addition, the "lead wire or terminal pin 124" in Stevenson '347 could not be in conductive relation with the "conductive ferrule 122," since such a connection would short the "lead wire or terminal pin 124" to the "conductive ferrule 122" and destroy the functionality of the "EMI filter capacitor assembly" of Stevenson '347. (*Id*. at 96-97, 107) One of skill in the art would further recognize that the "lead wire or terminal pin 124" of Stevenson '347 is in "conductive relation" with the "active electrode plates 116." (*See* col. 19, lines 25-28; Ex. 1002 at 97, 107.)

Claims 1 and 13 of the '077 patent also recite "placing an insulative shield over a surface of the feedthrough capacitor." Stevenson '347 discloses an "insulator 130" that is analogous to the claimed "insulative shield." (Ex. 1002 at 97-98, 107-

108.) As discussed above, one of skill in the art would recognize that an "insulative shield" as recited in Claims 1 and 13 is an "insulating material capable of shielding a surface from heat, splatter, and/or debris." The "insulator 130" of Stevenson '347 includes an insulative material such as alumina or glass and is positioned between the "capacitor 158" and the electronics of the implantable medical device. (*See* col. 14, lines 16-26; col. 16, lines 34-35; Ex. 1002 at 98, 108-09.) The '077 patent indicates that the "insulative shield" may include materials such as alumina or ceramic (i.e., glass). (*See* '077 patent; col. 5, lines 61-62; col. 6, lines 9-11; col. 7, lines 53-55.) Thus, the "insulator 130" of Stevenson and the "insulative shield" of the '077 patent include the same materials. Accordingly, a person of skill in the art would understand the "insulator 130" of Stevenson '347 to be an insulative material that is capable of and does shield a surface from heat, splatter, and/or debris. (Ex. 1002 at 100, 112.) In addition, the "insulator 130" of Stevenson '347 is located over a surface of the "feedthrough capacitor 158." (*See* Fig. 43; Ex. 1002 at 97, 107.) Accordingly, a person of skill in the art would readily recognize that Stevenson '347 discloses "placing an insulative shield over a surface of the feedthrough capacitor" as recited in Claims 1 and 13. (Ex. 1002 at 97, 107.)

Claim 1 further recites "conductively coupling electronic circuitry for the active implantable medical device to the terminal pin or leadwire." Claim 13 recites

"laser welding, thermal or ultrasonic bonding, soldering, or brazing electronic circuitry for the active implantable medical device to the terminal pin or leadwire." Stevenson '347 indicates that "terminal pins or lead wires 102, 124" are conductively coupled to electronic circuitry inside the housing of an active implantable medical device. (*See* col. 1, lines 13-23; col. 13, lines 47-60; col. 57-62; Ex. 1002 at 99-100, 110-11.) Indeed, a person of skill in the art would readily understand that the reason for the feedthrough filter of an implantable medical device is to filter electromagnetic interference from the leads, which are conductively coupled to electronic circuitry within the implantable medical device. (Ex. 1002 at 99, 111.) Stevenson '347 further indicates that electrical connections can be made via thermal-setting, brazing, welding, or soldering. (*See* col. 10, lines 32-34.) Accordingly, one of skill in the art would understand Stevenson '347 to further disclose that laser welding, thermal or ultrasonic bonding, soldering, and brazing are commonly used to create electrical connections, including electrically connecting a terminal pin or leadwire (e.g., 124) with electronic circuitry. (Ex. 1002 at 111.) Thus, one of skill in the art would understand Stevenson '347 to disclose "conductively coupling electronic circuitry for the active implantable medical device to the terminal pin or leadwire," as recited in Claim 1, and "laser welding, thermal or ultrasonic bonding, soldering, or brazing electronic circuitry

for the active implantable medical device to the terminal pin or leadwire," as recited in Claim 13. (*Id*.)

Claims 1 and 13 further recite that "the insulative shield protects the surface of the feedthrough capacitor from heat, splatter or debris occasioned by said coupling of the electronic circuitry to the terminal pin or leadwire." As discussed in the Claim Construction above (see section III(v)), this phrase merely recites an intended use and, therefore, should not be given patentable weight.

In addition, in the event the Board does apply patentable weight to such claim elements, Stevenson '347 discloses that the "insulative shield protects the surface of the feedthrough capacitor from heat, splatter or debris occasioned by said coupling of the electronic circuitry to the terminal pin or leadwire." (*See* Ex. 1002 at 100-01, 111-12.) Stevenson '347 specifically discloses that a capacitor can be adversely affected by and should be protected from laser welding. (*See* col. 2, lines 27-30; Ex. 1002 at 100, 111.) Similarly, one of skill in the art would recognize the benefits of protecting a capacitor from all sources of heat and debris including processes for forming electrical connections such as thermal-setting, brazing, welding, and soldering as disclosed by Stevenson '347. (*See* col. 10, lines 30-34; Ex. 1002 at 110, 111.) As discussed above, the "insulator 130" of Stevenson '347 includes an insulative material such as alumina or glass that is positioned between the "capacitor 158" and the electronics of the implantable

medical device. (*See* col. 14, lines 16-26; col. 16, lines 34-35; Ex. 1002 at 100-01, 112.) The "insulator 130" of Stevenson '347 includes the same materials as various examples of the "insulative shield" provided in the '077 patent, e.g., alumina or ceramic (i.e., glass). (*See* '077 patent; col. 5, lines 61-62; col. 6, lines 9-11; col. 7, lines 53-55.) Accordingly, a person of skill in the art would understand that the "insulator 130" of Stevenson '347 is an insulating material that is capable of and does shield the "capacitor 158" from heat, splatter, and/or debris occasioned by coupling of electronic circuitry to a terminal pin or leadwire in the same manner as the "insulative shield" of the '077 patent. (Ex. 1002 at 100-01, 111-12.)

Claim 13 further recites "co-bonding the insulative shield to the feedthrough capacitor using a conformal coating on the feedthrough capacitor." Stevenson '347 discloses an "insulating material or insulating washer 160" that is equivalent to the claimed "conformal coating." (*See* col. 19, line 43; Ex. 1002 at 110.) The "insulating material or insulating washer 160" of Stevenson '347 is an adhesive washer that is adhered to and "disposed below the capacitor 158" and above the insulative shield (e.g., "insulator 130"). (*See* col. 19, line 44; Fig. 43; Ex. 1002 at 109-10.) Accordingly, the "insulating material or insulating washer 160" of Stevenson '347 is applied to a surface of a circuit or electric component such as "capacitor 158." (Ex. 1002 at 110.) In addition, the "insulator 130" of

Stevenson ’347 is co-bonded to the “feedthrough capacitor 158” using an “insulating material or insulating washer 160.” (*See* col. 19, lines 46-48; Ex. 1002 at 110.)

For at least the foregoing reasons, the embodiment of Fig. 43 of Stevenson ’347 discloses the elements of both independent Claims 1 and 13.

ii. Independent Claims 23 and 35

Independent Claims 23 and 35 are each directed to a “feedthrough terminal assembly for an active implantable medical device,” which is shown at least in Fig. 43 of Stevenson ’347. (Ex. 1002 at 114, 125.) The claimed “feedthrough terminal assembl[ies]” include “a feedthrough capacitor having first and second sets of electrode plates, wherein the second set of electrode plates is conductively coupled to a conductive ferrule.” Stevenson ’347 discloses a “feedthrough capacitor 158” that includes “active electrodes 116” and “ground electrode plates 118.” (Col. 15, ll. 34-35; col. 19, ll. 25-27; Ex. 1002 at 115, 126.) One of ordinary skill in the art would recognize that these “active electrodes 116” and “ground electrode plates 118” are “first and second sets of electrode plates,” as claimed. (Ex. 1002 at 115, 126.) The “ground electrode plates 118” (which are analogous to the claimed “second set of electrode plates”) are “conductively coupled to the ferrule,” as claimed. (Col. 19, ll. 15-20 and 52-56; col 20., ll. 12-15; Ex. 1002 at 116, 126-27.)

Claims 23 and 35 further recite "a terminal pin or leadwire passing through the ferrule in non-conductive relation and through the feedthrough capacitor in conductive relation with the first set of electrode plates." Stevenson '347 discloses a "lead wire or terminal pin 124" that passes through the "conductive ferrule 122" in "non-conductive relation" with the "conductive ferrule 122." (*See* Fig. 43; Ex. 1002 at 117, 127.) One of skill in the art would readily recognize that the "lead wire or terminal pin 124" is in "non-conductive relation" with the "conductive ferrule 122" at least in view of the presence of an "insulator 130" that insulatively separates the "lead wire or terminal pin 124" from the "conductive ferrule 122." (Ex. 1002 at 117, 127.) In addition, the "lead wire or terminal pin 124" in Stevenson '347 could not be in conductive relation with the "conductive ferrule 122," since such a connection would short the "lead wire or terminal pin 124" to the "conductive ferrule 122" and destroy the functionality of the "EMI filter capacitor assembly" of Stevenson '347. (*Id*.) One of skill in the art would further recognize that the "lead wire or terminal pin 124" of Stevenson '347 is in "conductive relation" with the "active electrode plates 116." (*See* col. 19, lines 25-28; Ex. 1002 at 117, 127-28.)

Claims 23 and 35 of the '077 patent also recite "an insulative shield on a surface of the feedthrough capacitor." Stevenson '347 discloses an "insulator 130" that is analogous to the claimed "insulative shield." (Ex. 1002 at 117-18.) As

discussed above, one of skill in the art would recognize that an "insulative shield" as recited in Claims 23 and 35 is an "insulating material capable of shielding a surface from heat, splatter, and/or debris." The "insulator 130" of Stevenson '347 includes an insulative material such as alumina or glass and is positioned between the "capacitor 158" and the electronics of the implantable medical device. (*See* col. 14, lines 16-26; col. 16, lines 34-35; Ex. 1002 at 118-19, 128-29.) The '077 patent itself indicates that the "insulative shield" may include the same materials, i.e., alumina or ceramic (i.e., glass). (*See* '077 patent; col. 5, lines 61-62; col. 6, lines 9-11; col. 7, lines 53-55.) Accordingly, a person of skill in the art would understand that the "insulator 130" of Stevenson '347 is an insulating material that is capable of and does shield a surface from heat, splatter, and/or debris. (Ex. 1002 at 119, 129-30.) In addition, the "insulator 130" of Stevenson '347 is located over a surface of the "feedthrough capacitor 158." (*See* Fig. 43; Ex. 1002 at 119, 130.) Accordingly, a person of skill in the art would readily recognize that Stevenson '347 discloses "an insulative shield on a surface of the feedthrough capacitor" as recited in Claims 23 and 35. (Ex. 1002 at 117-18, 128-30.)

Claims 23 and 35 further recite "electronic circuitry for the active implantable medical device conductively coupled to the terminal pin or leadwire." Stevenson '347 indicates that "terminal pins or lead wires 102" are conductively coupled to electronic circuitry inside the housing of an active implantable medical

device. (*See* col. 1, lines 13-23; col. 13, lines 47-60; col. 57-62; Ex. 1002 at 119-20, 131-32.) Indeed, a person of skill in the art would readily understand that the reason for the feedthrough filter of an implantable medical device is to filter electromagnetic interference from the leads, which are conductively coupled to electronic circuitry within the implantable medical device. (Ex. 1002 at 120, 131-32.)

Claim 35 additionally recites that the "electronic circuitry [is] conductively coupled" by "laser welding, thermal or ultrasonic bonding, soldering, or brazing." As discussed in the Claim Construction above (see section III(vi)), this phrase recites a process element in an apparatus claim, and therefore, should not be given patentable weight. The phrase "by laser welding, thermal or ultrasonic bonding, soldering, or brazing" merely describes the process by which the electronic circuitry is conductively coupled to the terminal pin or leadwire. The phrase does not add any structure to the claimed apparatus.

In addition, in the event the Board does apply patentable weight to such claim elements, Stevenson '347 does disclose that the "electronic circuitry [is] conductively coupled" by "laser welding, thermal or ultrasonic bonding, soldering, or brazing," as recited in Claim 35. For example, Stevenson '347 states that electrical connections can be made via "thermal-setting, brazing, welding, or soldering" processes. (*See* col. 10, lines 32-34.) Accordingly, one of skill in the

art would understand Stevenson ’347 to further disclose that laser welding, thermal or ultrasonic bonding, soldering, and brazing are commonly used to create electrical connections, including electrically connecting a terminal pin or leadwire (e.g., 124) with electronic circuitry. (Ex. 1002 at 132.)

Claims 23 and 35 further recite that “the insulative shield protects the surface of the feedthrough capacitor from heat, splatter or debris occasioned by said coupling of the electronic circuitry to the terminal pin or leadwire.” As discussed in the Claim Construction above (see section III(v)), this phrase merely recites an intended use and, therefore, should not be given patentable weight.

In addition, in the event the Board does apply patentable weight to such claim elements, Stevenson ’347 discloses that the “insulative shield protects the surface of the feedthrough capacitor from heat, splatter or debris occasioned by said coupling of the electronic circuitry to the terminal pin or leadwire.” (*See* Ex. 1002 at 120-21.) Stevenson ’347 specifically discloses that a capacitor can be adversely affected by and should be protected from laser welding. (*See* col. 2, lines 27-30; Ex. 1002 at 132-33.) Similarly, one of skill in the art would recognize the benefits of protecting a capacitor from all sources of heat and debris including processes for forming electrical connections such as thermal-setting, brazing, welding, and soldering as disclosed by Stevenson ’347. (*See* col. 10, lines 30-34; Ex. 1002 at 120, 132.) As discussed above, the “insulator 130” of Stevenson includes an

insulative material such as alumina or glass and is positioned between the "capacitor 158" and the electronics of the implantable medical device. (*See* col. 14, lines 16-26; col. 16, lines 34-35; Ex. 1002 at 121, 133.) The "insulator 130" of Stevenson '347 includes the same materials as examples of the "insulative shield" provided in the '077 patent, e.g., alumina or ceramic (i.e., glass). (*See* '077 patent; col. 5, lines 61-62; col. 6, lines 9-11; col. 7, lines 53-55.) Accordingly, a person of skill in the art would understand that the "insulator 130" of Stevenson '347 is an insulating material that is capable of and does shield the "capacitor 158" from heat, splatter, and/or debris occasioned by coupling of electronic circuitry to a terminal pin or leadwire in the same manner as the "insulative shield" of the '077 patent. (Ex. 1002 at 120-21, 132-33.)

Claim 35 further recites "a conformal coating on the feedthrough capacitor, wherein the conformal coating co-bonds the insulative shield to the feedthrough capacitor." Stevenson '347 discloses an "insulating material or insulating washer 160" that is equivalent to the claimed "conformal coating." (*See* col. 19, line 43; Ex. 1002 at 130-31.) The "insulating material or insulating washer 160" of Stevenson '347 is an adhesive washer that is adhered to and "disposed below the capacitor 158" and above the insulative shield (e.g., " insulator 130"). (*See* col. 19, line 44; Fig. 43; Ex. 1002 at 130.) The adhesive washer of Stevenson '347 consists of a same material (i.e., polyimide) as an exemplary conformal coating of the '077

patent. (*See* Stevenson '047, col. 19, lines 46-48; Ex. 1002 at 103.) Accordingly, the "insulating material or insulating washer 160" is a "conformal coating" that is applied to a surface of a circuit or electrical component such as "capacitor 158." (Ex. 1002 at 130.) In addition, the "insulator 130" of Stevenson '347 is co-bonded to the "feedthrough capacitor 158" using a "insulating material or insulating washer 160." (*See* col. 19, lines 46-48; Ex. 1002 at 130.) Accordingly, Stevenson '347 discloses "a conformal coating on the feedthrough capacitor, wherein the conformal coating co-bonds the insulative shield to the feedthrough capacitor," as recited in Claim 35.

For at least the foregoing reasons, the embodiment of Fig. 43 of Stevenson '347 discloses both of independent Claims 23 and 35.

iii. Dependent Claims 2, 6-9, 14, 18, 19, 24, 28-31, 36, 40, and 41

Stevenson '347 also describes the features of each of dependent Claims 2, 6-9, 14, 18, 19, 24, 28-31, 36, 40, and 41. Claims 2, 14, 24, and 36 recite that "the insulative shield comprises a circuit board, ceramic, alumina-oxide, Fosterite, alumina, BT epoxy, berrylia alumina oxide, polyimide, modified polyimide, cyanate ester, composite epoxy, multifunctional epoxy, tetra-functional epoxy, modified epoxy or standard epoxy." Stevenson '347 discloses that the "insulator 130" includes alumina or glass. (*See* col. 14, lines 18-26; Ex. 1002 at 101-02, 113, 122, 134.) One of skill in the art would recognize that glass is a ceramic. (Ex.

1002 at 101, 121; Ex. 1015; pg. 7, Fig. 2.1.; Ex. 1016 at 256; Ex. 1017 at 527-28; Ex. 1018 at Abstract, 216 (last paragraph).) Accordingly, a person of ordinary skill in the art would understand that the "insulator 130" (which as discussed above is equivalent to the claimed "insulative shield") of Stevenson '347 comprises at least one of alumina or a ceramic such as glass. (Ex. 1002 at 101-02, 122; Ex. 1015; pg. 7, Fig. 2.1.) Accordingly, Stevenson '347 discloses each of Claims 2, 14, 24, and 26.

Claim 6 further recites "co-bonding the insulative shield to the feedthrough capacitor using a conformal coating on the feedthrough capacitor." Claim 28 similarly recites "a conformal coating on the feedthrough capacitor, wherein the conformal coating co-bonds the insulative shield to the feedthrough capacitor." As discussed above, Stevenson '347 discloses an "insulating material or insulating washer 160" that is equivalent to the claimed "conformal coating." (*See* col. 19, line 43; Ex. 1002 at 102-03, 122-23.) Accordingly, the "insulating material or insulating washer 160" is applied to a surface of a circuit or electrical component such as "capacitor 158." (*See* col. 19, line 44; Fig. 43; Ex. 1002 at 102.) In addition, the "insulator 130" of Stevenson '347 is co-bonded to the "feedthrough capacitor 158" using the "insulating material or insulating washer 160" (which may include an adhesive)." (*See* Fig. 43; col. 19, lines 46-48; Ex. 1002 at 123.) As such, Stevenson '347 discloses both "co-bonding the insulative shield to the

feedthrough capacitor using a conformal coating on the feedthrough capacitor," as recited in Claim 6, and "a conformal coating on the feedthrough capacitor, wherein the conformal coating co-bonds the insulative shield to the feedthrough capacitor," as recited in Claim 28.

Claims 7, 18, 29, and 40 recite that the "conformal coating comprises a non-conductive polymer, a thermal setting epoxy, or a polyimide." Stevenson '347 indicates that the "insulating material 160" may include an "adhesively coated polyimide washer." (Col. 19, lines 46-48.) Accordingly, Stevenson '347 discloses that the conformal coating (e.g., 160) comprises a polyimide. (*See* col. 19, lines 46-48; Ex. 1002 at 103, 113, 124, 134.) Accordingly, Stevenson '347 discloses each of Claims 7, 18, 29, and 40.

Claims 8, 19, 30, and 41 recite that "the active implantable medical device comprises a cardiac pacemaker, an implantable defibrillator, a congestive heart failure device, a hearing implant, a cochlear implant, a neurostimulator, a drug pump, a ventricular assist device, an insulin pump, a spinal cord stimulator, an implantable sensing system, a deep brain stimulator, an artificial heart, an incontinence device, a vagus nerve stimulator, a bone growth stimulator, a gastric pacemaker, or a prosthetic device." Stevenson '347 discloses such elements, stating in column 1, lines 15-19 that the implantable medical devices used include "cardiac pacemakers (bradycardia devices), cardioverter defibrillators

(tachycardia), neuro-stimulators, internal drug pumps, cochlear implants, ventricular assist devices, and other medical implant applications." Accordingly, Stevenson '347 discloses each of Claims 8, 19, 30, and 41.

Claim 9 recites that the "conductive coupling comprises laser welding, thermal or ultrasonic bonding, soldering, or brazing." Similarly, Claim 31 recites that the "electronic circuitry is conductively coupled to the terminal pin or leadwire by laser welding, thermal or ultrasonic bonding, soldering, or brazing." Stevenson '347 discloses that electrical connections can be made via thermal-setting, brazing, welding, or soldering. (*See* col. 10, lines 32-34.) One of ordinary skill in the art would readily understand that, as disclosed in Stevenson '347, welding, thermal bonding, soldering, and brazing were known processes for creating electrical connections, including for conductively coupling a terminal pin or leadwire (e.g., 124) with electronic circuitry. (Ex. 1002 at 104, 124-25.) Accordingly, Stevenson '347 discloses the elements of each of Claims 9 and 31.

In addition, as discussed above, the phrase "by laser welding, thermal or ultrasonic bonding, soldering, or brazing" recited in Claim 31 is a process element in an apparatus claim and should not be given patentable weight. (*See* Claim Construction section III(vi) above.) The phrase "by laser welding, thermal or ultrasonic bonding, soldering, or brazing" merely describes the process by which

the electronic circuitry is conductively coupled to the terminal pin or leadwire. The phrase does not add any structure to the claimed apparatus.

Ground 3. A second embodiment of Stevenson '347 anticipates Claims 1, 2, 8, 9, 23, 24, 30, and 31

Claims 1, 2, 8, 9, 23, 24, 30, and 31 of the '077 patent are unpatentable under 35 U.S.C. § 102(e) as anticipated by Stevenson '347. As discussed in detail below, in a second embodiment as disclosed generally in Figs. 36-42, Stevenson '347 discloses a "process for manufacturing a feedthrough terminal assembly" and a "feedthrough terminal assembly" including the features recited by Claims 1, 2, 8, 9, 23, 24, 30, and 31 of the '077 patent. (*See* Ex. 1002 at 135-154.)

i. Independent Claims 1 and 23

Independent Claim 1 is directed to a "process for manufacturing a feedthrough terminal assembly for an active implantable medical device," and independent Claim 23 is directed to a "feedthrough terminal assembly for an active implantable medical device," which are shown in Figs. 36-42 of Stevenson '347. (Ex. 1002 at 135-36, 145-46.) For convenience, Figs. 36, 37, and 41 are reproduced below:

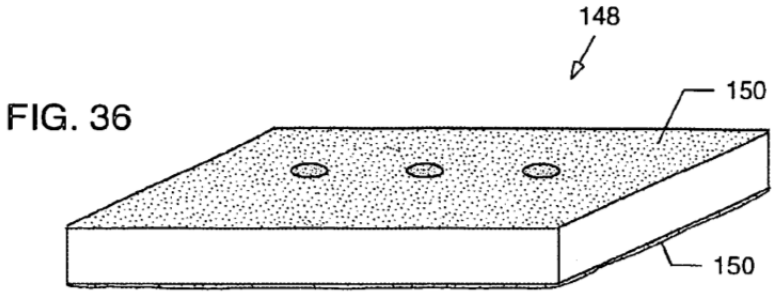

FIG. 36

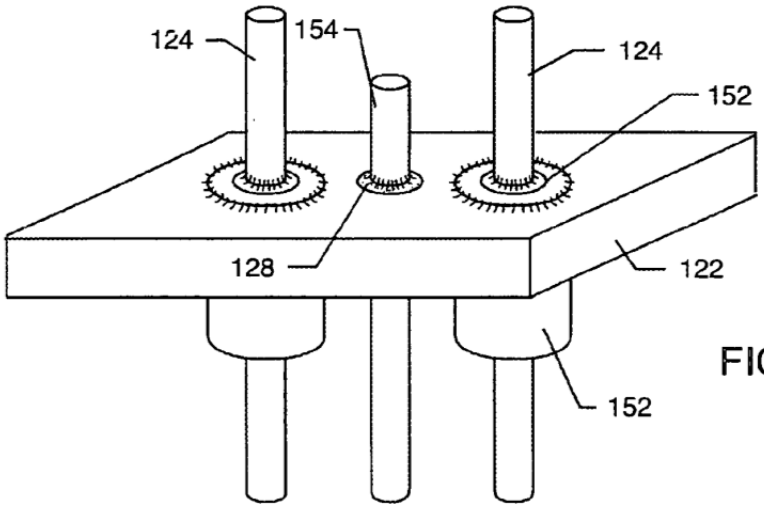

FIG. 37

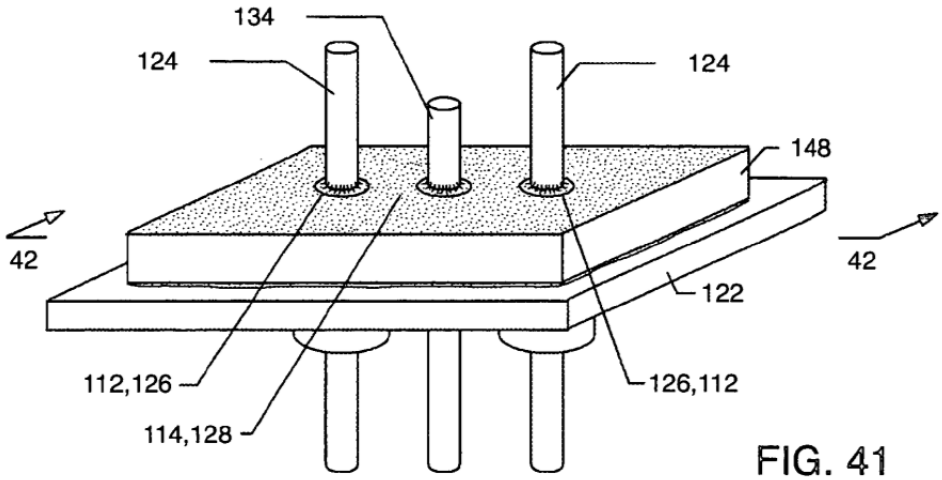

FIG. 41

The "process" of Claim 1 includes "associating a feedthrough capacitor with a conductive ferrule, the feedthrough capacitor having first and second sets of electrode plates, wherein the second set of electrode plates is conductively coupled to the ferrule." The "feedthrough terminal assembly" of Claim 23 includes a "feedthrough capacitor having first and second sets of electrode plates, wherein the second set of electrode plates is conductively coupled to a conductive ferrule."

Stevenson ’347 discloses a “capacitor 148” that is associated with a “conductive ferrule 122.” (Col. 17, ll. 56-58; Ex. 1002 at 136.) The “capacitor 148” is a feedthrough capacitor at least in that “[t]erminal pins or lead wires 102 extend into and pass through [the] EMI feedthrough filter capacitor, as is well known in the art.” (*See* col. 13, lines 57-60; *see also* col. 15, lines 57-62; Ex. 1002 at 136, 146.) The “capacitor 148” includes “active electrodes 116” and “ground electrode plates 118.” (Fig. 42; col. 15, ll. 34-35; col. 18, lines 30-42; Ex. 1002 at 136, 146.) One of ordinary skill in the art would recognize that these “active electrodes 116” and “ground electrode plates 118” are “first and second sets of electrode plates,” as claimed. (Ex. 1002 at 136, 146.) The “ground electrode plates 118” (which are analogous to the claimed “second set of electrode plates”) are “conductively coupled to the ferrule,” as claimed. (Fig. 42; col. 18, ll. 35-43; Ex. 1002 at 138-39, 147-48.)

Claim 1 further recites “passing a terminal pin or leadwire through the ferrule in non-conductive relation and through the feedthrough capacitor in conductive relation with the first set of electrode plates.” Similarly, Claim 23 recites “a terminal pin or leadwire passing through the conductive ferrule in non-conductive relation and through the feedthrough capacitor in conductive relation with the first set of electrode plates.” Stevenson ’347 discloses passing “lead wires or terminal pins 124” through the “conductive ferrule 122” in “non-conductive relation” with

the "conductive ferrule 122." (*See* Figs. 37, 41, 42; col. 18, ll. 33-35; Ex. 1002 at 139, 148.) One of skill in the art would readily recognize that the "lead wire or terminal pin 124" is in "non-conductive relation" with the "conductive ferrule 122" at least in view of the presence of an "insulator 130" that insulatively separates the "lead wire or terminal pin 124" from the "conductive ferrule 122." (Ex. 1002 at 139, 148.) In addition, the "lead wire or terminal pin 124" in Stevenson '347 could not be in conductive relation with the "conductive ferrule 122," since such a connection would short the "lead wire or terminal pin 124" to the "conductive ferrule 122" and destroy the functionality of the "EMI filter capacitor assembly" of Stevenson '347. (*Id*.) One of skill in the art would further recognize that the "lead wire or terminal pin 124" of Stevenson '347 is in "conductive relation" with the "active electrode plates 116." (*See* col. 19, lines 25-34; Ex. 1002 at 139-40, 148-49.)

Claim 1 of the '077 patent also recites "placing an insulative shield over a surface of the feedthrough capacitor," and Claim 23 recites "an insulative shield on a surface of the feedthrough capacitor." Stevenson '347 discloses a "glass layer 150" that is analogous to the claimed "insulative shield." (Fig. 36; col. 17, ll. 58-61; Ex. 1002 at 140-41, 149-50.) As discussed above, one of skill in the art would recognize that an "insulative shield" as recited in Claims 1 and 23 is an "insulating material capable of shielding a surface from heat, splatter, and/or debris." The

"glass layer 150" of Stevenson '347 includes an insulative material, i.e., glass, that is formed on both sides of the "capacitor 148." (Fig. 36.) Accordingly, the "glass layer 150" is positioned between the "capacitor 148" and the electronics of the implantable medical device. (*See* Figs. 41 and 42; Ex. 1002 at 141-42, 150.) The '077 patent indicates that the "insulative shield" may include materials such as alumina or ceramic (i.e., glass). (*See* '077 patent; col. 5, lines 61-62; col. 6, lines 9-11; col. 7, lines 53-55; *see also* Ex. 1015; pg. 7, Fig. 2.1.) Accordingly, a person of skill in the art would understand the "glass layer 150" of Stevenson '347 to be an insulating material that is capable of and does shield a surface from heat, splatter, and/or debris. (Ex. 1002 at 141, 150.) In addition, the "glass layer 150" of Stevenson '347 is located at a position over a surface of the "feedthrough capacitor 158." (*See* Fig. 43; Ex. 1002 at 141, 150.) Accordingly, a person of skill in the art would readily recognize that Stevenson '347 discloses "placing an insulative shield over a surface of the feedthrough capacitor" as recited in Claim 1, and "an insulative shield on a surface of the feedthrough capacitor," as recited in Claim 23. (Ex. 1002 at 140-41, 149-50.) As discussed above, "on a surface" should be construed to mean "over a surface." (*See* Claim Construction above (section III(i)).)

Claim 1 further recites "conductively coupling electronic circuitry for the active implantable medical device to the terminal pin or leadwire." Similarly, Claim 23

recites "electronic circuitry for the active implantable medical device conductively coupled to the terminal pin or leadwire." Stevenson '347 indicates that "terminal pins or lead wires 102" are conductively coupled to electronic circuitry inside the housing of an active implantable medical device. (*See* col. 1, lines 13-23; col. 13, lines 47-60; col. 57-62; Ex. 1002 at 142-43, 151.) Indeed, a person of skill in the art would readily understand that the reason for the feedthrough filter of an implantable medical device is to filter electromagnetic interference from the leads, which are conductively coupled to electronic circuitry within the implantable medical device. (Ex. 1002 at 142, 151.) Stevenson '347 further states that electrical connections can be made via thermal-setting, brazing, welding, or soldering. (*See* col. 10, lines 32-34.) Accordingly, one of skill in the art would understand Stevenson '347 to further disclose that laser welding, thermal or ultrasonic bonding, soldering, and brazing are commonly used to create electrical connections, including electrically connecting a terminal pin or leadwire (e.g., 124) with electronic circuitry. (Ex. 1002 at 142-43, 151.) Thus, one of skill in the art would understand Stevenson '347 to disclose "conductively coupling electronic circuitry for the active implantable medical device to the terminal pin or leadwire," as recited in Claim 1, and "laser welding, thermal or ultrasonic bonding, soldering, or brazing electronic circuitry for the active implantable medical device to the terminal pin or leadwire," as recited in Claim 13.

Claims 1 and 23 further recite that "the insulative shield protects the surface of the feedthrough capacitor from heat, splatter or debris occasioned by said coupling of the electronic circuitry to the terminal pin or leadwire." As discussed in the Claim Construction above (see section III(v)), this phrase merely recites an intended use and, therefore, should not be given patentable weight.

In addition, in the event the Board does apply patentable weight to such claim elements, Stevenson '347 discloses that the "insulative shield protects the surface of the feedthrough capacitor from heat, splatter or debris occasioned by said coupling of the electronic circuitry to the terminal pin or leadwire." (Ex. 1002 at 143-44, 152-53.) Stevenson '347 specifically discloses that a capacitor can be adversely affected by and should be protected from laser welding. (*See* col. 2, lines 27-30; Ex. 1002 at 143, 152.) Similarly, one of skill in the art would recognize the benefits of protecting a capacitor from all sources of heat and debris including processes for forming electrical connections such as thermal-setting, brazing, welding, and soldering as disclosed by Stevenson '347. (*See* col. 10, lines 30-34; Ex. 1002 at 143, 152.) As discussed above, the "glass layer 150" of Stevenson '347 includes an insulative material, i.e., glass, and is positioned between the "capacitor 148" and the electronics of the implantable medical device (indeed, the "glass layer 150" is placed on both the top and bottom surfaces of the "capacitor 148." (*See* col. 14, lines 16-26; col. 16, lines 34-35; Ex. 1002 at 144,

152-53.) In addition, Stevenson '347 states that "such glass layers 150 [ ] render the overall capacitor 148 stronger [so] that it will better resist both mechanical and thermal stress during handling, installation and assembly of the implantable medical device." (Col. 17, lines 61-65.) Accordingly, a person of skill in the art would understand the "glass layer 150" of Stevenson '347 to be an insulating material that is capable of and does shield the "capacitor 148" from heat, splatter, and/or debris occasioned by coupling of electronic circuitry to a terminal pin or leadwire in the same manner as the "insulative shield" of the '077 patent. (Ex. 1002 at 144, 152-53.)

For at least the foregoing reasons, the embodiment of Figs. 36-42 of Stevenson '347 discloses each of the elements of independent Claims 1 and 23.

ii. Dependent Claims 2, 8, 9, 24, 30, and 31

Stevenson '347 also describes the features of each of dependent Claims 2, 8, 9, 24, 30, and 31. Claims 2 and 24 recite that "the insulative shield comprises a circuit board, ceramic, alumina-oxide, Fosterite, alumina, BT epoxy, berrylia alumina oxide, polyimide, modified polyimide, cyanate ester, composite epoxy, multifunctional epoxy, tetra-functional epoxy, modified epoxy or standard epoxy." As discussed above, the "glass layer 150" of Stevenson '347 is analogous to the claimed "insulative shield." One of skill in the art would recognize that glass is a ceramic. (Ex. 1002 at 144, 153; Ex. 1015; pg. 7, Fig. 2.1.; Ex. 1016 at 256; Ex.

1017 at 527-28; Ex. 1018 at Abstract, 216 (last paragraph).) Accordingly, Stevenson '347 discloses each of Claims 2 and 24.

Claims 8 and 30 recite that "the active implantable medical device comprises a cardiac pacemaker, an implantable defibrillator, a congestive heart failure device, a hearing implant, a cochlear implant, a neurostimulator, a drug pump, a ventricular assist device, an insulin pump, a spinal cord stimulator, an implantable sensing system, a deep brain stimulator, an artificial heart, an incontinence device, a vagus nerve stimulator, a bone growth stimulator, a gastric pacemaker, or a prosthetic device." Stevenson '347 discloses such elements, stating in column 1, lines 15-19 that the implantable medical devices used include "cardiac pacemakers (bradycardia devices), cardioverter defibrillators (tachycardia), neuro-stimulators, internal drug pumps, cochlear implants, ventricular assist devices, and other medical implant applications." Accordingly, Stevenson '347 discloses each of Claims 8 and 30.

Claim 9 recites that the "conductive coupling comprises laser welding, thermal or ultrasonic bonding, soldering, or brazing." Similarly, Claim 31 recites that the "electronic circuitry is conductively coupled to the terminal pin or leadwire by laser welding, thermal or ultrasonic bonding, soldering, or brazing." Stevenson '347 discloses that electrical connections can be made via thermal-setting, brazing, welding, or soldering. (*See* col. 10, lines 32-34.) One of ordinary skill in the art

would readily understand that, as disclosed in Stevenson '347, welding, thermal bonding, soldering, and brazing were known processes for creating electrical connections, including for conductively coupling a terminal pin or leadwire (e.g., 124) with electronic circuitry. (Ex. 1002 at 145, 154.) Accordingly, Stevenson '347 discloses the elements of each of Claims 9 and 31.

In addition, as discussed above, the phrase "by laser welding, thermal or ultrasonic bonding, soldering, or brazing" recited in Claim 31 is a process element in an apparatus claim and should not be given patentable weight. (*See* Claim Construction section III(vi) above.) The phrase "by laser welding, thermal or ultrasonic bonding, soldering, or brazing" merely describes the process by which the electronic circuitry is conductively coupled to the terminal pin or leadwire. The phrase does not add any structure to the claimed apparatus.

CONCLUSION

For the foregoing reasons, Petitioner respectfully requests that Trial be instituted and that Claims 1, 2, 6-9, 13, 14, 18, 19, 23, 24, 28-31, 35, 36, 40, and 41 be canceled.

Respectfully submitted,

Dated: February 6, 2015 By: */Paul S. Hunter/*

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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 06, 2015, by USPS Express Mail directed to the attorneys of record for the patent at the following address:

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