PETITION FOR INTER PARTES REVIEW
OF U.S. PATENT NO. 9,059,532 UNDER 35 U.S.C. §§ 311-319

On behalf of Natus Medical Inc., Natus Neurology Inc., Embla Systems LLC and Embla Systems Ltd. ("Petitioners"), inter partes review is respectfully requested for claims 1-9 and 13 of U.S. Patent No. 9,059,532 ("the '532 Patent").
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LIST OF EXHIBITS

Exhibit 1001 – U.S. Patent No. 9,059,532 B2 ("the ’532 Patent")

Exhibit 1002 – Expert Invalidity Report of Dr. Justin C. Williams and all attachments thereto (for the purposes of this Petition, Dr. Williams’s report and attachments are consecutively paginated and citation herein is made to the Exhibit page number).

Exhibit 1003 – U.S. Patent No. 937,130 to Williams ("Williams")

Exhibit 1004 – U.S. Patent No. 1,001,054 to Lawrence ("Lawrence")

Exhibit 1005 – U.S. Patent No. 1,115,459 to Abizaid ("Abizaid")

Exhibit 1006 – U.S. Patent No. 1,193,050 to Orewiler ("Orewiler")

Exhibit 1007 – U.S. Patent No. 3,092,759 to Sommer ("Sommer")

Exhibit 1008 – U.S. Patent No. 4,671,591 to Archer ("Archer")

Exhibit 1009 – U.S. Patent No. 4,832,608 to Kroll ("Kroll")

Exhibit 1010 – U.S. Patent No. 5,326,272 to Harhen et al. ("Harhen")

Exhibit 1011 – U.S. Patent No. 6,148,486 to Uehara et al. ("Uehara")

Exhibit 1012 – U.S. Patent No. 6,461,307 to Kristbjarnarson et al. ("Kristbjarnarson")


Exhibit 1015 – International Patent Application Publication No. WO 2008/102140 to Caldecott (“Caldecott”) (for the purposes of this Petition, citation to Caldecott is made to the original page numbers)


Exhibit 1017 – U.S. Patent No. 8,025,539 to Hermannsson (“Hermannsson”)

Exhibit 1018 – U.S. Patent No. 8,251,736 to McIntire et al. (“McIntire”)

Exhibit 1019 – U.S. Provisional Application No. 61/358,472

Exhibit 1020 – PCT Application No. IS/050010


Exhibit 1025 – File History European Patent No. 2584962, Response to Opposition, November 23, 2015


Exhibit 1028 – 2009 CareFusion Catalog

Exhibit 1029 – U.S. Patent No. 4,430,777 to Takeda (‘Takeda’)

I. MANDATORY NOTICES PURSUANT TO 37 C.F.R. § 42.8

A. Real Parties-in-Interest

Natus Medical Inc., Natus Neurology Inc., Embla Systems LLC and Embla Systems Ltd. are the Petitioners and real parties-in-interest.

B. Related Matters


C. Lead and Back-Up Counsel and Service Information

Petitioners designate the following counsel, available at 316 N. Milwaukee St., Suite 200, Milwaukee, WI 53202. Petitioners consent to electronic service.

<table>
<thead>
<tr>
<th>Lead Counsel</th>
<th>Back-Up Counsel</th>
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<td>Thomas S. Reynolds II</td>
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II. GROUNDS FOR STANDING

Petitioners certify that the ’532 Patent is available for inter partes review and that Petitioners are not barred or estopped from requesting inter partes review based on the grounds identified in this Petition.
III. INTRODUCTION

A. The ’532 Patent

The ’532 Patent describes and claims a belt connector for electrically connecting an electrode belt to a biometric device. As the patent admits, belts and belt connectors were known in the prior art and used for, among other things, respiratory inductance plethysmography (RIP), a method of monitoring respiration based on the inductive changes in a wire loop that encircles the torso of a patient. ’532 Patent, col. 1 ll. 12-18. Such belts—comprising conductive wires attached in a zig-zag pattern to elastic bandages—were known since at least the 1980s. See, e.g., U.S. Patent No. 4,308,872; Ex. 1002 at 13-15. The invention of the ’532 Patent is purportedly an “improved belt connector[] that [is] reliable and easy to use and maintain.” ’532 Patent, col. 1 ll. 16-18.

Claim 1, the only independent claim at issue in this Petition, is directed to typical features of electrode belt connectors. It requires a molded plastic connector frame including a receiving hole with a slot extending from it “configured to function as a female snap button fastener for receiving and fastening the frame to a protrusion of the male portion of the snap connector electrode.” ’532 Patent, col. 5 ll. 36-60. Electrical contact between the electrode belt and a “male portion of the snap connector electrode” is made between a conductor of the belt that passes through the

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receiving hole while being “wrapped around” an “engaging member” adjacent to the receiving hole. Figure 2A of the patent, annotated below, shows an embodiment:

Snap connections for making electrical contact, of course, were well known prior to 2010, as were electrical connections in which male conductor is inserted into a hole to make electrical contact. *See* Ex. 1002 at 28-47. These features were also known in electrode belt connectors well before the date of the purported invention. *Id.* at 26-27. Although the dependent claims addressed in this Petition recite certain additional features—a shield, a cover, and a row of teeth to fasten the belt and adjust its length—all of these features were also conventional and known prior to the time of the purported invention. *Id.* at 27. The purported invention, therefore, does not improve upon prior art belt connectors; it is unpatentable over the prior art.
B. The ’532 Patent Prosecution


All applications leading to the issuance of the ’532 Patent identify Kormakur Hlini Hermannsson as the sole named inventor. Exs. 1019, 1020, 1021. After the ’532 Patent issued, however, the Patent Owner (“Nox”) filed a request to add Sveinbjorn Hoskuldsson as a named inventor. Ex. 1024. On February 2, 2016, the PTO granted Nox’s request to change the inventorship of the ’532 Patent and issued a post-issuance Certificate of Correction on March 1, 2016. Id. An earlier Nox patent (U.S. Patent No. 8,025,539 to Hermannsson) was not considered as prior art by the PTO during examination of the application that issued as the ’532 Patent because the Hermannsson ’539 Patent appeared to enjoy unity of inventorship with the application that issued as the ’532 Patent. It was not until March 1, 2016, nine months after the ’532 Patent issued and when Hoskuldsson was added as an inventor post-issuance, that unity of inventorship with the Hermannsson ’539 Patent was broken.
IV. STATUTORY GROUNDS FOR THE CHALLENGES

The ’532 Patent issued from an application filed before March 16, 2013, so pre-AIA law applies. MPEP 2159.01. This Petition provides challenges (discussed in Section VI as Grounds 1-8) under pre-AIA 35 U.S.C. §§ 102 and 103 based on the following prior art patent references:

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<th>Reference</th>
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<td>(1) US 937,130</td>
<td>Oct. 19, 1909</td>
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<td>(2) US 1,001,054</td>
<td>Aug. 22, 1911</td>
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<tr>
<td>(3) US 1,115,459</td>
<td>Oct. 27, 1914</td>
</tr>
<tr>
<td>(4) US 1,193,050</td>
<td>Aug. 1, 1916</td>
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<tr>
<td>(5) US 3,092,759</td>
<td>Jan. 2, 1959</td>
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<tr>
<td>(6) US 4,671,591</td>
<td>Jun. 9, 1987</td>
</tr>
<tr>
<td>(7) US 5,326,272</td>
<td>Jul. 5, 1994</td>
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<tr>
<td>(8) US 6,148,486</td>
<td>Nov. 21, 2000</td>
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<td>(9) US 6,461,307</td>
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<td>Nov. 16, 2006</td>
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<td>(13) US 8,025,539</td>
<td>Sep. 27, 2011</td>
</tr>
<tr>
<td>(14) US 8,251,736</td>
<td>Aug. 28, 2012</td>
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</table>

References 1-12 all published more than one year prior to June 25, 2010; thus, they are prior art under pre-AIA 35 U.S.C. § 102(b).

Hermannsson issued from an application filed on May 17, 2010—prior to the application that issued as the ’532 Patent—and lists only Kormakur Hermannsson as an inventor. Following issuance of the ’532 Patent, the PTO granted Nox’s request to add Sveinborn Hoskuldsson as an inventor to the ’532 Patent. Accordingly, Hermannsson is a previously filed application “to another” for the purposes of 35
U.S.C. § 102(e). See MPEP 2136.04 ("The inventive entity is different if not all inventors are the same. The fact that the application and reference have one or more inventors in common is immaterial."). Further, Nox admits that Hermannsson is prior art to the ’532 Patent. Ex. 1025 ¶ 3.19 (identifying U.S. Patent App. Pub. No. 2010/0297868, first publication of Hermannsson, as reference “D1, and admitting that an embodiment of the Hermannsson’s connector “was produced and sold by Nox prior to the invention of the present patent[.]” (Id. (emphasis added) (referring to EP 2,584,962, the European equivalent to the ’532 Patent)).


V. CLAIM CONSTRUCTION

Pursuant to 37 C.F.R. § 42.100(b), each claim at issue in this proceeding should be given its broadest reasonable construction or interpretation ("BRI") to a person
having ordinary skill in the art (“PHOSITA”)\(^1\) in light of the specification. *In re Cuozzo Speed Techs.*, 778 F.3d 1271, 1279-81 (Fed. Cir. 2015). Because the BRI standard of claim construction is different than the litigation standard, Petitioners reserve the right to present different claim constructions in the Related Litigation. *See In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1369 (Fed. Cir. 2004).

A. “flexibility”

Claim 1 recites a plastic frame including a “receiving hole having radial flexibility.” The specification does not discuss or define this “flexibility” other than to say that the receiving hole has “sufficient flexibility to function as a female snap fastener.” ’532 Patent, col. 5 ll. 18-20; col. 2 ll. 59-62.

Petitioners propose that the BRI for the term “flexibility” is “the ability of a part (related to its geometry and material properties) to elastically deform under an applied stress.” PHOSITAs understood that most engineering materials exhibit

\(^{1}\) Petitioners submit that the relevant field is medical device development and that a PHOSITA, at the time of the alleged invention of the ’532 Patent, would have a Master’s or Doctorate’s degree in mechanical engineering, bio-medical engineering or equivalent related field; a Bachelor’s degree and roughly one year of relevant experience; or an Associate’s degree with approximately three years of relevant design experience. Ex. 1002 at 11-12.
elastic properties, meaning that for applied stresses below the elastic limit (yield limit) of the material, a part made of the material will return to its original configuration (i.e., exhibit flexibility). Ex. 1002 at 24-24. PHOSITAs further understood that parts can undergo both plastic and elastic deformation if loaded above the elastic limit of their material, meaning that the applied stress causes both permanent (plastic) and temporary (elastic) deformation. *Id.* Parts loaded beyond the material’s elastic limit still exhibit “flexibility” consistent with a PHOSITA’s ordinary and customary understanding of the term, even if the higher applied stress also happens to lead to permanent deformation. *Id.*

B. “passing through the receiving hole”

Claim 1 also recites a conductor “passing through the receiving hole.” Petitioners propose that the BRI for the term “passing through the receiving hole” is self-evident and is without any limitation as to direction or extent. *Id.* at 25. The specification does not limit the ordinary and customary meaning of the term; the only requirement of the claimed conductor “passing through the receiving hole” is that it make physical (and thus electrical) contact with a male electrode inserted into the receiving hole. *Id.*; ’532 Patent, col. 5 ll. 49-54; col. 3 ll. 14-24.

VI. CLAIMS 1-9 AND 13 OF THE ’532 PATENT ARE UNPATENTABLE.

Claims 1-9 and 13 are unpatentable based on the prior art and grounds discussed herein. These grounds are supported by the declaration and opinions of Dr. Justin C.
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Williams, chair of the department of Biomedical Engineering at the University of Wisconsin-Madison. Ex. 1002. Dr. William’s declaration includes further analysis and detailed claim charts demonstrating the invalidity of the claims of the ’532 Patent in view of the prior art. *See* Ex. 1002.

**A. Ground 1: Claims 1-3, 6-9, and 13 Are Anticipated by Hermannsson.**

Claims 1-3, 6-9, and 13 are anticipated by Hermannsson under 35 U.S.C. § 102(e) because it discloses each limitation of those claims either expressly or inherently. *See* Schering Corp. v. Geneva Pharms., Inc., 339 F.3d 1373, 1377 (Fed. Cir. 2003); Verdegal Bros., Inc. v. Union Oil Co. of Cal., 814 F.2d 628, 631 (Fed. Cir. 1987) (citations omitted).

Hermannsson, the Nox-owned patent not considered as prior art during prosecution of the ’532 Patent, teaches an “electrode belt and a belt connector” with a plastic frame that receives and fastens to a mating male snap protrusion to make an electrical connection with a biometric device. Like the ’532 Patent, Hermannsson’s belt connector includes a conductor from the belt that passes through the receiving hole (so it can physically and electrically connect with a male snap inserted into the hole) that wraps around structure adjacent the receiving hole.
1. **Claim 1**

An electrode belt and a belt connector for electrically connecting a conductor of the electrode belt to a male portion of a snap connector electrode connected to a biometric device, the belt connector comprising:

Hermannsson teaches “a belt connector for electrically connecting an electrode belt to a biometric device.” Ex. 1017, col. 1 ll. 22-39. Hermannsson further teaches that the belt connector has a circular hole “of suitable dimension to form a female snap button receiver for a male snap fastener on said biometric device.” *Id.*

*a molded plastic frame including a receiving hole having radial flexibility, the receiving hole being configured to function as a female snap button fastener for receiving and fastening the frame to a protrusion of the male portion of the snap connector electrode.*

Hermannsson teaches an electrode belt connector made from “plastic, such as polyethylene, e.g. low density polyethylene (LDPE) or high density polyethylene (HDPE), or derivatives such as polyethylene terephthalate (PET) or polyfluoroethylene (PTFE), or more preferably polypropylene.” Ex. 1017, col. 62-
67. Hermannsson expressly teaches a receiving hole formed in the plastic frame “configured to function as a female snap button fastener for receiving and fastening” to a male snap fastener, specifying that the hole in the electrode belt connector “itself forms a female snap button receiver;” is “of suitable dimension to form a female snap button receiver;” and is “the main connecting hole” or the “main fastener and connection hole.” Ex. 1017, col. 2 ll. 29-32; col. 2 ll. 56-60; col 2 l. 65-col. 3 l. 1; col. 3 ll. 12-16.

PHOSITAs knew the plastics taught by Hermannsson are conventionally injection molded to make parts (like the disclosed belt connector) and that such plastics are examples of elastic materials (i.e., materials that exhibit flexibility). Ex. 1002 at 30, 58. PHOSITAs further understood that a hole “of suitable dimension to form a female snap button receiver” as taught by Hermannsson, bounded by such elastic materials, inherently exhibits “radial flexibility”—i.e., will elastically deform in response to a radially applied load (normal to the surface of a curved wall bounding the hole)—and will function as a female snap button fastener. Id. at 30-31, 57-59.

**a fastener configured to fasten the frame to a first end of said electrode belt, and**

Hermannsson teaches a plastic frame of the belt connector with teeth 13 that fasten an electrode belt to the frame—i.e., the teeth 13 are a “fastener configured to
fasten the frame to a first end of said electrode belt.” Ex. 1017, col. 2 ll. 14-17; col. 3 ll. 32-35, figs. 2-4a.

Hermannsson also teaches the claimed electrode belt conductor passing through the receiving hole of a belt connector while being wrapped around an engaging member adjacent to the receiving hole, and forced into physical (and, therefore, electrical) contact with a lateral surface of a mating male snap. See, e.g., Ex. 1017, fig. 1a (showing wire 5 positioned to make contact with a lateral surface of a male snap electrode inserted into the main fastener and electrical connection hole 4). Hermannsson’s conducting wire from the belt (wire loop 5) is “held in place” by wrapping around “extending ridge 12 and small wings 19” adjacent to the receiving hole. Ex. 1017, col. 3 ll. 47-48; figs. 1a & 5. The ridge and wings ensure “proper placement and location of the wire loop 5,” and these members “hold the wire loop in suitable proximity to the hole”—i.e., the ridge and wings are engaging members.
adjacent the receiving hole that engage the electrode belt conductor, which wraps around them. *Id.* col. 3 ll. 22-29; figs.1a & 5.

Hermannsson further teaches that the conducting wire “will be exposed and visible from the outside through the [receiving] hole” and that “part of said wire loop comes in contact with the male snap fastener when [the male snap fastener is] inserted in the hole, forming an electrical connection.” *Id.* col. 2 ll. 32-35; col. 2 ll. 66-67 (identifying the “hole” as the “main fastener and electrical connection hole”). Accordingly, the wire loop of Hermannsson necessarily “passes through” the receiving hole; if it did not, electrical connection with a male snap fastener inserted in the hole would not be possible. Ex. 1002 at 61.

**wherein radial flexibility of said receiving hole is achieved by one or more slot extending from said hole, and wherein said receiving hole and one or more slot are formed by at least one elongated member having flexibility transverse to its longitudinal axis, thus imparting flexibility to the width of the hole.**

Finally, Hermannsson teaches an electrode belt connector having a “slot” extending from its receiving hole and contributing to its flexibility as required by claim 1. Slot or “extended hole 10” extends from the receiving hole giving it a “keyhole-like shape.” Ex. 1017, fig. 2; col. 2 ll. 56-60; col. 3 ll. 29-31. PHOSITAs knew that plastics (LDPE, HDPE and polypropylene) are elastic materials that exhibit flexibility in all directions, including transverse to a longitudinal axis, thereby imparting “flexibility to the width of the hole.” Ex. 1002 at 30-31 & 62.
PHOSITAs knew that structure surrounding a hole is more amenable to elastic deformation (i.e., is more flexible) if the hole is not fully bounded—i.e., a slot, or the absence of structure contributes to the “radial flexibility” of the hole. *Id.* at 31 n.10.

2. **Claim 2**

   The electrode belt and the belt connector of claim 1, wherein said belt connector further comprises a shield member which is arranged on a rear side of said frame to electrically shield the conductor of the electrode belt from the rear side exterior of the belt connector.

   As taught by Hermannsson, back element (2) of the electrode connector separates the conductor of the electrode belt from a patient’s body. Ex. 1017, col. 2 ll. 14-21; figs. 3a, 3b, 4a, 4b, 4c. Thus, Hermannsson’s back element (2)—made out of “non-conducting materials, most preferably plastic,” like the rest of the belt connector—is “a shield member which is arranged on a rear side of said frame to electrically shield the conductor of the electrode belt from the rear side exterior of the belt connector.” *Id.* col. 1 ll. 62-63.

3. **Claim 3**

   The electrode belt and the belt connector of claim 2, wherein said shield member is a sheet member extending from the frame, which sheet member is configured to be folded over onto the rear side of the frame to cover the back side of said receiving hole and engaged conductor.

   Figure 4 of Hermannsson “shows the outside faces of a front element [3] and back element [2] joined together with a hinge.” Ex. 1017, col. 1 ll. 49-50 (reference
numerals corrected, see id. col. 4 l. 5; col. 2 ll. 14-17. Back element (2), which separates the conductor of the electrode belt from a patient’s body (i.e., is the “shield member” of Claim 2) that extends from and is connected to the frame (front member 3) by a hinge 18 so it can fold over and cover the “back side of said receiving hole and engaged conductor.” Thus, Hermannsson teaches this claim.

Ex. 1017, Fig. 4a.

4. **Claim 6**

*The electrode belt and the belt connector of claim 1, wherein said fastening means comprise a slot with a row of teeth, pins or hooks transverse to the belt direction, to engage a belt end.*

Claim 6, which depends from Claim 1, includes a limitation directed to “said fastening means.” Claim 1 does not recite a “fastening means.” Accordingly, this claim does not comply with the requirements of 35 U.S.C. § 112 (pre-AIA). For the purposes of this Petition, and in an attempt to make sense of the claim, Petitioners have construed the limitation of Claim 6 directed to “said fastening means” as referring to the claimed “fastener” of Claim 1. Petitioners reserve the right to argue that Claim 6 is invalid under 35 U.S.C. § 112 in the Related Litigation.
Hermannsson teaches an electrode belt held between front and back elements of a connector having a row of teeth (13) to “hold firmly the end of a belt 8 when inserted between the engaged front and back elements.” Ex. 1017, col. 3 ll. 31-33, figs. 4a-4b. Thus, Hermannsson teaches fastening means comprising a slot (the space between front and back elements that accepts the belt) “with a row of teeth, pins or hooks transverse to the belt direction, to engage a belt end.” Ex. 1002 at 165.

5. Claim 7

The electrode belt and the belt connector of claim 1, wherein said fastening means comprise a ridge member or row of pins which lies transverse to the belt direction and to which a belt end can be fastened onto with heat melting or gluing.

Like Claim 6, this claim includes a limitation directed to “said fastening means” which is not present in Claim 1 and is therefore also invalid under 35 U.S.C. § 112 (pre-AIA). Again, without waiving its rights to make this argument in the Related Litigation, Petitioners have construed the limitation as referring to the claimed “fastener” of Claim 1 for the purposes of this Petition only.

Hermannsson teaches an electrode connector with a row of teeth (13) which are a row of pins “to which a belt end can be fastened onto with heat melting or gluing.” Ex. 1017, col. 2 ll. 14-28. Hermannsson explains the front element (with teeth) can be glued or melted to the back element “fastening in between them an end of said electrode belt.” Id. Notably, during examination of the ’532 Patent, the Examiner
took Official Notice that “use of gluing techniques is well known for fastening pieces
together.” Ex. 1022 at 9.

6. Claim 8

The electrode belt and the belt connector of claim 1, wherein said
belt connector comprises an adjustment slot with teeth, pin or
hook members, through which slot a loop of desired length of said
belt can be inserted, to adjust and fix the length of the belt.

Belt adjusting opening (17) is an adjustment slot. See Ex. 1017, col. 3 ll. 42-43,
fig. 3a. Hermannsson teaches that “any of various conventional means can be used
to make the length of the belt adjustable,” understood by PHOSITAs to include
typical features of buckles, like teeth, pins or hooks in a slot, for adjusting a belt
length. Id. col. 2 ll. 9-10; Ex. 1002 at 208-209. To the extent not anticipated, Claim
8 is obvious in view of Hermannsson and the knowledge of a PHOSITA. See id.

7. Claim 9

The electrode belt and the belt connector of claim 1, wherein said
belt is a flexible textile belt with an electrode wire interwoven in the
belt or laminated between two layers of the belt.

PHOSITAs understood that the “inductive belts used in respiratory inductive
plethysmography” taught by Hermannsson are “flexible textile belt[s] with an
electrode wire interwoven in the belt or laminated between two layers of the belt.”
Ex. 1002 at 223-24; U.S. Patent No. 4,308,872 (early disclosure of RIP belt
technology); see also, generally, Exs. 1012-13.
8. **Claim 13**

The electrode belt and the belt connector of claim 1, wherein the conductor of the electrode belt is an electrode wire.

Hermannsson teaches that the wire of the electrode belt is “itself the conducting element.” Ex. 1017, col. 2 ll. 47-51.

**B. Ground 2: Claims 1-9 and 13 Are Obvious Based on McIntire in View of Hermannsson.**

McIntire teaches multiple embodiments of a connector assembly for connecting an electrical lead to a male stud electrode. These embodiments include a retention plate with an opening (i.e., a receiving hole) therein that receives and fastens to a male snap protrusion of an electrode. Ex. 1018, figs. 12-14. The retention plates are “sufficiently resilient” to “deform” to fit over and retain a male snap stud of an electrode to form a “snap-fit connection.” See, e.g., id. col. 6 ll. 3-32. The embodiment of Figure 12 includes two slots extending from the opening 450 in retention plate 444 and a cover sheet 478 that is adhered to the retention plate:

![Diagram](image_url)

*Id.* fig. 12; col. 10 l. 59-col. 11 l. 35.

Figure 13 teaches a similar connector assembly with “an end portion 542 of [an] electrical conductor 522” that wraps around the material that defines opening 550 of
retention plate 544. The electrical conductor is “held between, and in engagement with, the electrical contact 530 [male snap protrusion] and a wall 527 of the retention plate 548.”

_id. fig. 13 (annotated); col. 11 l. 36-col. 12 l. 9; see also, fig. 14.

1. **Motivation to Combine**

The combination of McIntire and Hermannsson renders Claim 1 and all of the dependent claims challenged in this Petition invalid as obvious. _See_ 35 U.S.C. § 103(a); _KSR Int’l Co. v. Teleflex Inc._, 127 S. Ct. 1727, 1739 (2007) (“The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.”). To the extent McIntire lacks any limitation of the challenged claims, Hermannsson teaches such limitation and would be combined with the teachings of McIntire by a PHOSITA in a single device having all the limitations of each claim.
PHOSITAs would be motivated to combine the teachings of McIntire and Hermannsson, both of which are examples of admittedly known prior art electrode connectors, into a single device. ’532 Patent, col. 1 ll. 12-16; Ex. 1002 at 52-55 & 67-68. McIntire explicitly states that its teachings “may be used with any system for measuring any physiologic information or performing any physiologic procedure”—i.e., with a RIP belt like that taught by Hermannsson. Ex. 1018, col. 12 l. 65-col. 13 l. 1. The prior art teaches the market demands for low-cost, mass-producible electrode belts that can adjust to a variety of patient sizes (Ex. 1002 at 52), and McIntire and Hermannsson both teach various electrode belt and connector designs that seek to meet these design criteria. Ex. 1018, col. 12 ll. 57-60; Ex. 1017, col. 1 ll. 57-61, col. 2 ll. 9-13. McIntire and Hermannsson also suggest the use of compatible structures and features in a single electrode belt connector; for example, McIntire states that “[e]ach component, and/or each step of one embodiment, can also be used in combination with other components and/or steps of other embodiments.” Ex. 1018, col. 13 ll. 14-17. Accordingly, PHOSITAs would reasonably expect to successfully combine the compatible (and similar) teachings of McIntire and Hermannsson into an electrode belt with all the limitations of each of the claims of the ’532 Patent.
2. Claim 1

An electrode belt and a belt connector for electrically connecting a conductor of the electrode belt to a male portion of a snap connector electrode connected to a biometric device, the belt connector comprising:

Like Hermannsson (Section VI.A.1), McIntire suggests to a PHOSITA that the “connector assembly for connecting an electrical lead to an electrode” disclosed therein “may be used with any system for measuring any physiologic information or performing any physiologic procedure.” Ex. 1018, col. 1, ll. 7-10; col. 12 l. 65-col. 13 l.1. PHOSITAs would understand that McIntire’s teachings apply to electrode belts. Ex. 1002 at 54, 68.

a molded plastic frame including a receiving hole having radial flexibility, the receiving hole being configured to function as a female snap button fastener for receiving and fastening the frame to a protrusion of the male portion of the snap connector electrode,

Hermannsson teaches an electrode connector with a plastic frame and a “main fastener and electrical connection hole.” Section VI.A.1. McIntire teaches multiple embodiments of electrode connectors having a retention plate with an opening therein sized to fit over a male snap fastener electrode—i.e., a receiving hole. The material of the retention plate is “sufficiently resilient” so the retention plate “connects to the electrical contact [male snap fastener electrode] in a snap-fit connection.” See, e.g., Ex. 1018, col. 11 ll. 36-60, figs. 12-14. Figures 13 and 14 expressly teach retention plates 544/644 with respective openings 550/650 that
receive and fasten to a male snap electrode 530/630. See, e.g., id. col. 11 ll. 54-60 (“Once the enlarged-diameter portion 552 has passed through the opening 550, the opening 550 returns toward the undeformed size to engage a reduced-diameter portion 553 of the electrical contact 530, such that . . . the retention plate 544 connects to the electrical contact 530 in a snap-fit connection.”); see also id. col. 13 ll. 42-60. PHOSITAs knew and understood such retention plates of “sufficiently resilient” material to include and mean retention plates of molded plastic. Ex. 1002 at 34-38 & 69.

a fastener configured to fasten the frame to a first end of said electrode belt, and

Hermannsson teaches teeth that fasten the frame to a belt. Section VI.A.1. PHOSITAs knew a connector with such a fastener is one of the known ways that “[t]he embodiments [of McIntire] may be used with any system for measuring any physiologic information or performing any physiologic procedure.” Ex. 1018, col. 12 l. 65-col. 13 l.1; Ex. 1002 at 54-55, 67-68.

an engaging member adjacent to said receiving hole, the engaging member engaging the conductor of the electrode belt by the conductor passing through the receiving hole while being wrapped around the engaging member, such that when the male portion of the snap connector electrode penetrates the receiving hole, the conductor is forced into physical contact with at least a lateral surface of the male portion of the snap connector electrode.

Hermannsson teaches the claimed electrode belt conductor passing through the receiving hole while wrapped around a ridge and wings adjacent to the receiving
hole. Section VI.A.1. McIntire teaches at least two embodiments of an electrode connector including a conductor that wraps around structure adjacent a receiving hole in the connector, wherein the conductor passes through the receiving hole to make electrical contact with a lateral surface of a male snap electrode inserted in the hole.

In Figure 13 (annotated), electrical conductor 522 wraps around retention plate 544 (engaging member) and passes through opening 550 such that the electrical conductor 522 is forced into contact with a lateral surface of a male snap electrode 530 when inserted into opening 550. Ex. 1018, fig. 13; col. 11 ll. 61-64; col. 12 ll. 38-43; Ex. 1002 at 35-38, 71-73.

In Figure 14, end portion 642 of electrical conductor 622 wraps around channel 663 formed in retention plate 644 (engaging member) adjacent to an opening 650. End portion 642 passes through opening 650 such that the conductor 642 is forced
into contact with a lateral surface of a male snap electrode 630 when inserted into opening 650:

*Id.* fig. 14, col. 12 ll. 38-43; Ex. 1002 at 72-73.

*wherein radial flexibility of said receiving hole is achieved by one or more slot extending from said hole, and wherein said receiving hole and one or more slot are formed by at least one elongated member having flexibility transverse to its longitudinal axis, thus imparting flexibility to the width of the hole.*

Hermannsson teaches a plastic electrode belt connector having a slot extending from its flexible receiving hole. Section VI.A.1. McIntire also teaches this limitation. For example, Figure 12 shows connector assembly 412, with a retention plate 444 of “sufficiently resilient” material having two slots extending from a central portion of opening 450, bounded by “a pair of flexible beams 427” that are “sufficiently resilient such that the size of the opening 450 may deform to allow the enlarged-diameter portion 452 of the electrical contact 430 to be forced through the opening
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450.” Ex. 1018, col. 11 ll. 4-16. Once the male portion of the electrical contact has passed through, opening 450 “return[s] toward the undeformed size” to engage a reduced-diameter portion of the contact in a “snap-fit connection.” *Id.* PHOSITAs understood that the flexible beams 427, made of a resilient (i.e., elastic) material, have “flexibility transverse to [their] longitudinal ax[es].” Ex. 1002 at 35 & 73-74 (opining that the embodiments of Figures 13 and 14 also teach this limitation).

3. **Claim 2**

*The electrode belt and the belt connector of claim 1, wherein said belt connector further comprises a shield member which is arranged on a rear side of said frame to electrically shield the conductor of the electrode belt from the rear side exterior of the belt connector.*

Hermannsson teaches this limitation. Section VI.A.2. So does McIntire, which teaches electrode connectors with a housing or cover that shields a conductor of the electrode connector from a rear side exterior of the connector. *See, e.g.*, Ex. 1018, col. 9 l. 52-col. 10 l. 4, fig. 7. For example, the embodiment of Figure 7 includes hinge 125 connecting housing 126 to retention plate 144, wherein housing 126 is a “shield member . . . arranged on a rear side” of the connector to shield the electrode belt’s conductor:
Further embodiments of McInitire include a cover sheet (578 or 678) on the rear side of the frame to shield the conductor and also teach this limitation. *Id.* col. 11 ll. 42-44; col. 12 ll. 43-50, figs. 13-14.

4. Claim 3

The electrode belt and the belt connector of claim 2, wherein said shield member is a sheet member extending from the frame, which sheet member is configured to be folded over onto the rear side of the frame to cover the back side of said receiving hole and engaged conductor.

Hermannsson teaches this limitation. Section VI.A.3. Likewise, McIntire’s housing 126 (depicted in Figure 7, discussed above) is a shield member (and a sheet member extending from the frame) that is connected to the frame by hinge 125 so that it folds over onto the rear side of the frame as claim 3 requires. Ex. 1002 at 125-26.
5. Claim 4

The electrode belt and the belt connector of claim 1, wherein said belt connector comprises a cover enclosing the frame, which cover either includes a hole overlapping the receiving hole of the frame, or can be readily perforated by pressing the connector onto a male fastener which fits the receiving hole of the frame.

The '532 Patent admits that “existing standards for medical devices,” require electrode belts and connectors to “be configured such that a person wearing the belt . . . is insulated from current running through the belt.” ‘532 Patent, col. 1 ll. 41-44.

Hermannsson teaches that direct contact between the conductor of the belt connector and a patient’s skin should be avoided. Ex. 1017, col. 2 ll. 52-55. McIntire teaches an adhesive layer (sticker), including embodiments with openings, to cover and attach to a connector body for various purposes including securing an electrical lead to the connector body. Ex. 1018, col. 7 ll. 40-56; col. 11 l.64-col. 12 l. 3; col. 12 ll. 43-50, figs. 2, 13-14.

PHOSITAs aware of the “existing standards” and Hermannsson’s instruction to avoid contact with the conductor through the receiving hole would be motivated to use the adhesive layer (sticker) taught by McIntire to enclose the frame and allow access to the receiving hole. Ex. 1002 at 131-32.
6. **Claim 5**

The electrode belt and the belt connector of claim 4, wherein said cover is selected from the group consisting of a folded paper, plastic or fabric sticker, a plastic envelope and a textile envelope.

In rejecting Claim 5 (Pending Claim 7) during prosecution, the Examiner noted that “many plastic materials are known to make such covers,” and selection of such a cover is an obvious design choice. Ex. 1022 at 7. Indeed, McIntire teaches an adhesive layer 78 (a sticker), understood by PHOSITAs to be a “plastic sticker” that covers an electrode connector housing. See, e.g., Ex. 1018, col. 7 ll. 40-46; col. 11 1.64-col. 12 l. 3; col. 12 ll. 43-50, figs. 2, 13 & 14; Ex. 1002 at 152-53.

7. **Claims 6-9 and 13**

To the extent these claims can be construed, Hermannsson teaches their limitations. Sections VI.A.4-VI.A.8. Thus, the combination of McIntire and Hermannsson, combined for at least the reasons discussed with respect to Claim 1, renders Claims 6-9 and 13 unpatentable under 35 U.S.C. § 103. Ex. 1002 at 165-66, 186, 211, 225-26, 232.

C. **Ground 3: Claims 1, 6-9, and 13 Are Obvious Based on Harhen in View of Hermannsson.**

Like the prior art already discussed, Harhen teaches “restriction fit electrode connector assemblies or adapters in which a connector body slides over an upstanding member, e.g., a bulbous post, of an electrode, ‘snapping’ into place so as to permit secure, rotatable electrical coupling between the connector and the
electrode.” Ex. 1010, col. 1 ll. 17-23. Harhen teaches that the connector body should “provide sufficient resilience or compressibility . . . to cause, e.g., and electrode post, to ‘snap’ into place . . . .” Id. col. 3 ll. 30-35. Harhen further teaches an electrode connector having a “conductor that passes through [a] receiving hole while being wrapped around an engaging member” that has “one or more slot[s] extending from the hole.” Id. col. 5 ll. 40-42; figs. 10-12. As shown in Figure 10, wire 58 is embedded in the material of body 50 and therefore wraps around portions of the body 50 that are adjacent to the receiving hole (channel 57). As shown in Figure 12, wire 58 “is located at the surface” of the channel that receives a male electrode so that “electrical contact” is made “between the wire 58 and the [male snap electrode] 32” when the male snap electrode is received in channel 57.

Id. figs. 10 & 12 (annotated); col. 5 ll. 32-45.

1. **Motivation to Combine**

The combination of Harhen and Hermannsson renders independent claim 1 and at least dependent claims 6-9 and 13 invalid as obvious. See 35 U.S.C. § 103(a);
KSR, 127 S. Ct. at 1739. To the extent Harhen lacks any limitation of those claims, the limitation can be found in Hermannsson, which would be incorporated with the teachings of Harhen by a PHOSITA into a single device having all of the limitations of each claim.

PHOSITAs would be motivated to combine the teachings of Harhen and Hermannsson, both of which are examples of admittedly known prior art electrode connectors, into a single device. ’532 Patent, col. 1 ll. 12-16; Ex. 1002 at 52-55 & 75-76. The prior art teaches the market demand for low-cost, mass-producible electrode belts that can adjust to a variety of patient sizes. Ex. 1002 at 52-55. Harhen and Hermannsson not only teach the desire for low-profile electrode connectors that are easy to use and maintain, but embodiments of the same. Ex. 1010, col. 32-37 (teaching an electrode connector with a secure, but detachable, restriction fit coupling); Ex. 1017, col. 1 ll. 57-61, col. 2 ll. 9-13. Further, prior to the earliest priority date of the ’532 Patent, PHOSITAs knew and understood that the primary design functions of an electrode belt are to adjustably fit a patient’s body and to connect and conduct electrical current. Ex. 1002 at 54. Thus, PHOSITAs would naturally consider and combine the teachings of existing prior art electrode belts and connectors to address the market demand for low-cost, mass-producible, adjustable electrode belts. Id. at 52-55.
Harhen and Hermannsson teach and suggest the use of compatible structures and features in a single electrode belt connector. See, e.g., Ex. 1010, col. 6 ll. 21-23 (“Many other variations will occur to one of skill in this art in view of this disclosure.”). Accordingly, PHOSITAs would reasonably expect to successfully combine the teachings of Harhen and Hermannsson into an electrode belt having the limitations of Claim 1. Ex. 1002 at 75-76. Being no more than a combination of familiar elements according to known methods with predictable results, Claim 1 is obvious under KSR. See 127 S. Ct. at 1739.

2. Claim 1

An electrode belt and a belt connector for electrically connecting a conductor of the electrode belt to a male portion of a snap connector electrode connected to a biometric device, the belt connector comprising:

Like Hermannsson (Section VI.A.1), Harhen teaches a connector assembly “in which a connector body slides over an upstanding member, e.g., a bulbous post, of an electrode, ‘snapping’ into place so as to permit secure, rotatable electrical coupling between the connector and the electrode.” Ex. 1010, col. 1 ll. 17-23. PHOSITAs would reasonably expect to successfully combine features of Harhen’s electrode connector with Hermannsson’s electrode belt and connector, such combination being no more than an electrode belt attached to an electrode connector using conventional means. Ex. 1002 at 75-81.
a molded plastic frame including a receiving hole having radial flexibility, the receiving hole being configured to function as a female snap button fastener for receiving and fastening the frame to a protrusion of the male portion of the snap connector electrode.

Hermannsson teaches an electrode connector with a plastic frame and a “main fastener and electrical connection hole.” Section VI.A.1. Harhen teaches that “[t]he composition of the connector body 10 is chosen so as to provide sufficient resilience or compressibility in the sides 18a-18b of channel 18 and stop 30 to cause, e.g., an electrode post, to ‘snap’ into place adjacent stop 30, thereby providing a secure restriction fit.” Ex. 1010, col. 3 ll. 29-35. Harhen also teaches that the connector may comprise “thermoplastic” or “polymeric” materials and be made from a mold, which PHOSITAs understand as being a molded plastic frame with elastic (i.e., flexible) properties. Ex. 1002 at 77-78; Ex. 1010, col. 5 l. 50-60. Thus, the receiving hole (channel 55 in Figure 10) designed to receive a bulbous post (i.e., the male portion of an electrode) exhibits radial flexibility. Ex. 1002 at 77-78; Ex. 1010, col. 4 l. 65-col. 5 l.2.

a fastener configured to fasten the frame to a first end of said electrode belt, and

Hermannsson teaches teeth to fasten the frame to a belt. Section VI.A.1. PHOSITAs knew that such a fastener is one of the known ways Harhen’s “low profile connector [could be adapted to be] especially useful in the biomedical field.” Ex. 1010, col. 1 ll. 9-17; Ex. 1002 at 75-76.
an engaging member adjacent to said receiving hole, the engaging member engaging the conductor of the electrode belt by the conductor passing through the receiving hole while being wrapped around the engaging member, such that when the male portion of the snap connector electrode penetrates the receiving hole, the conductor is forced into physical contact with at least a lateral surface of the male portion of the snap connector electrode.

Hermannsson teaches the claimed conductor of the electrode belt passing through the receiving hole while being wrapped around a ridge and wings adjacent to the receiving hole. Section VI.A.1. Harhen also teaches this limitation. As shown in Figure 10, wire 58 (the conductor) is engaged by a portion of the body of connector 50 (the engaging member) adjacent to and defining the receiving hole (channel 55). Ex. 1010, col. 4 l. 65-col. 5 l. 17; Ex. 1002 at 38-40 & 78-81. Wire 58 wraps around the structure of connector 50 (the engaging member) while the wire 58 passes through the receiving hole. Ex. 1010, col. 5 ll. 40-45 (“[W]ire 58 is located at the surface of the narrower portion 57 of the channel 55 [such] that . . . electrical contact may be achieved between the wire 58 and the upstanding connecting member 32 when . . . the upstanding connecting member 32 is received in the narrower portion 57 of the channel 55.”). Figure 12 shows wire 58 at the surface of the channel 55 so that it makes physical (and electrical) contact with the lateral surface of the male electrode when inserted into channel 55 (a receiving hole).
wherein radial flexibility of said receiving hole is achieved by one or more slot extending from said hole, and wherein said receiving hole and one or more slot are formed by at least one elongated member having flexibility transverse to its longitudinal axis, thus imparting flexibility to the width of the hole.

Finally, Hermannsson teaches a plastic electrode belt connector having a slot extending from its flexible receiving hole. Section VI.A.1. Harhen also teaches this limitation. Harhen’s electrode connector includes a channel with a semi-circular end, which is a hole (labeled as 55) having a narrow portion 57 where the electrode is retained and an elongated portion (not labeled in Figure 10) which is a slot extending from the semi-circular end. Ex. 1010, col. 4 l. 68-col. 5 l. 2. As expressly taught by Harhen, PHOSITAs knew and understood that the material that defines receiving channel/hole 55 is flexible and allows for flexibility of the width of the receiving hole for connecting to a male snap; i.e., such structure includes flexibility in a direction transverse to a longitudinal direction. Id. col. 3 ll. 29-35; Ex. 1002 at 81.
3. **Claims 6-9, and 13**

To the extent these claims can be construed, Hermannsson teaches their limitations. Sections VI.A.4-VI.A.8. Thus, the combination of Harhen and Hermannsson, combined for at least the reasons discussed with respect to Claim 1, renders Claims 6-9 and 13 unpatentable under 35 U.S.C. § 103. Ex. 1002 at 165-66, 186, 211, 225-26 & 232.

**D. Ground 4: Claims 1-5, 9 and 13 Are Obvious Based on McIntire in View of Kristbjarnarson or Linville; Claims 6-8 Are Obvious Based on McIntire in View of Kristbjarnarson.**

Kristbjarnarson and Linville are prior art references that teach biometric belts. Kristbjarnarson² teaches a sensor belt that includes a “flexible ribbon” with a conductor strip secured therein and adapted to encircle the chest or abdomen of a patient. Ex. 1012, Abstract. Kristbjarnarson explains that the conductor strip may be woven into the flexible ribbon or laminated between two flexible ribbons, further teaching a connector assembly secured to an end of this “ribbon” such that electrical signals from the belt are transmitted through the connector assembly to a monitoring device. *Id.* col. 5 ll. 2-4; col. 5 ll. 28-45; col. 3 ll. 37-45.

² The named inventors of Kristbjarnarson include Kormakur Hermannsson (misspelled “Hermannson”), sole inventor of the Hermannsson patent discussed above and one of the named inventors of the ’532 Patent.
Linville teaches a RIP transducer belt having a conductor woven into the elastic material of a belt. Ex. 1013 ¶0001, fig. 6. Linville teaches a low-cost, reusable belt “having a common size that can be expanded for use on a wide range of patient sizes” with “ends attached to releasable connectors . . . to secure the encompassing belt around a body part under study.” *Id.* ¶¶0017, 0028, fig. 1.
Either of these references combined with the electrode connector of McIntire renders Claims 1-5, 9, and 13 unpatentable under 35 U.S.C. § 103; the combination of McIntire and Kristbjarnarson, which teaches an electrode connector with teeth to adjust and fix and end of an electrode belt, also renders Claims 6-8 obvious.

1. Motivation to Combine

PHOSITAs would be motivated and reasonably expect to successfully combine elements of the biometric electrical connector taught by McIntire with Kristbjarnarson’s or Linville’s electrode belt into a single entity because these references state that their respective teachings can be used in “any system for measuring any physiologic information” (Ex. 1018, col. 12 ll. 66-67), that it is “readily apparent to those skilled in the art that the [Linville’s device] can be adapted to other uses including, . . . other fields in the life sciences and related research industries” (Ex. 1013 ¶0057), and that variations and modifications of belts and belt connectors are “apparent to those skilled in the art” (Ex. 1012, col. 8 ll. 29-30). It would be obvious to PHOSITAs to combine the wholly compatible teachings of Kristbjarnarson or Linville with McIntire in a single device without producing new or different functions than those separately performed by the elements. See KSR, 127 S. Ct. at 1739; Ex. 1002 at 81-82, 89-90.
2. Claim 1

An electrode belt and a belt connector for electrically connecting a conductor of the electrode belt to a male portion of a snap connector electrode connected to a biometric device, the belt connector comprising:

Both Kristbjarnarson and Linville teach electrode belts and belt connectors compatible with the electrode connector of McIntire (Section VI.B.2) that connects to a male snap protrusion of a biometric device. Ex. 1002 at 81-82, 89-90. Kristbjarnarson teaches a RIP transducer belt (a “ribbon”) and teaches “a connector assembly for connecting and securing a first free end of the ribbon to a second free end of the ribbon.” Ex. 1012, Abstract. Linville teaches a transducer (RIP) belt “in the form of a woven fabric providing a substantially flat extensible belt for encircling a portion of a patient for a wide range of patient sizes.” Ex. 1013, Abstract.

a molded plastic frame including a receiving hole having radial flexibility, the receiving hole being configured to function as a female snap button fastener for receiving and fastening the frame to a protrusion of the male portion of the snap connector electrode,

McIntire teaches multiple embodiments of electrode connectors made of molded plastic with an opening therein sized to fit over a male snap fastener electrode. Section VI.B.2. Both Kristbjarnarson and Linville teach electrode belts connected to an electrode connector. Kristbjarnarson teaches “a connector assembly for connecting and securing a first free end of the ribbon to a second free end of the ribbon [that] is further adapted to be connected to a monitoring device.” Ex. 1012,
Abstract. Linville teaches that an “attachment means is provided for releasably connecting and securing the ends of the extensible transducer belt about a patient, and is preferably in the form of corresponding plastic buckle ends at each end of the belt.” (Ex. 1013, ¶0019).

*a fastener configured to fasten the frame to a first end of said electrode belt, and*

McIntire suggests that the electrode connector disclosed therein “may be used with any system for measuring any physiologic information or performing any physiologic procedure.” Section VI.B.2; Ex. 1018, col. 12 l. 65-col. 13 l.1. Both Kristbjarnarson and Linville teach electrode belts with a connector including a fastener configured to fasten an electrode connector frame to a first end of a belt.

Kristbjarnarson teaches a connector assembly having a “piercing assembly” to fasten and secure the connector to a belt end. Ex. 1012, col. 6 ll. 30-41, fig. 3 (“A first end of the ribbon 10 is secured to a first connector portion 31 of a connector assembly 30, as shown in FIG. 3.”). Similarly, Linville teaches an electrode belt “attached to releasable connectors” at each end. Ex. 1013, ¶0028 (“The ends of the belt are attached to releasable connectors 14. . . to secure the encompassing belt around a body part under study.”).
an engaging member adjacent to said receiving hole, the engaging member engaging the conductor of the electrode belt by the conductor passing through the receiving hole while being wrapped around the engaging member, such that when the male portion of the snap connector electrode penetrates the receiving hole, the conductor is forced into physical contact with at least a lateral surface of the male portion of the snap connector electrode.

McIntire teaches an electrode connector having a conductor wrapped around a structure adjacent an opening in a retention plate such that when a male portion of a snap electrode is retained by the connector the conductor is forced into physical contact with a lateral surface of the male snap electrode. Section VI.B.2.

wherein radial flexibility of said receiving hole is achieved by one or more slot extending from said hole, and wherein said receiving hole and one or more slot are formed by at least one elongated member having flexibility transverse to its longitudinal axis, thus imparting flexibility to the width of the hole.

Finally, McIntire teaches electrode connectors that include this limitation. Section VI.B.2. Figures 12-14 of McIntire teach electrode connectors with a receiving hole in a resilient material having a slot extending therefrom and having an elongated member with flexibility transverse to a longitudinal axis. Id.

3. Claims 2-5

The combination of McIntire and Kristbjarnarson or Linville renders independent claim 1 obvious. Section VI.D.2. Because McIntire also teaches all the dependent limitation of claims 2-5 (Sections VI.B.3-VI.B.6), and PHOSITAs would be motivated to combine the teachings of McIntire with Kristbjarnarson or Linville in a single device for at least the same reasons discussed in Section VI.D.1, these claims
are also rendered obvious by either combination. Ex. 1002 at 116-19, 126-27, 149-50 & 161.

4. **Claim 9**

   **The electrode belt and the belt connector of claim 1, wherein said belt is a flexible textile belt with an electrode wire interwoven in the belt or laminated between two layers of the belt.**

   Kristbjarnarson and Linville each teach an electrode belt connector connected to a flexible textile belt with an electrode wire interwoven in the belt or laminated between two layers of the belt. Kristbjarnarson teaches that “sensor ribbon 10 includes a conductor strip 13 secured thereto. The conductor strip 13 may be woven into the flexible ribbon.” Ex. 1012, col. 5 ll. 2-4; col. 5 ll. 28-45, fig. 2. Linville teaches “[a]t least one electrical conductor is woven directly into the fabric.” Ex. 1013, Abstract. Thus, the same combinations (McIntire/Kristbjarnarson) or (McIntire/Linville) that render Claim 1 invalid (combined for at least the same reasons) render Claim 9 invalid. Ex. 1002 at 226-28.

5. **Claim 13**

   **The electrode belt and the belt connector of claim 1, wherein the conductor of the electrode belt is an electrode wire.**

   McIntire teaches an electrode connector having a conductor that is an electrode wire. *See, e.g.,* Ex. 1018, col. 11 ll. 40-42, fig. 13. PHOSITAs would be motivated to combine McIntire with an electrode belt like the ones taught by Kristbjarnarson and Linville (a wire in the belt that is a conductor) for at least the reason that
PHOSITAs understood that electrode belts include a conductor that is an electrode wire. Ex. 1012, Abstract (teaching an electrode belt (ribbon) with a “conductor strip secured thereto.”); Ex. 1013 ¶0034 (teaching a “high strand count copper wire conductor woven into an elastic fabric belt.”); Ex. 1002 at 232-34. Thus, the same combinations (McIntire/Kristbjarnarson) or (McIntire/Linville) that render Claim 1 invalid (combined for at least the same reasons) render Claim 13 invalid.

6. Claims 6-8

To the extent Claims 6-8 can be construed, they are obvious based on McIntire in view of the teachings of Kristbjarnarson related to a “piercing assembly.” Ex. 1012, fig. 3, col. 6 ll. 31-43; Ex. 1002 at 177-78, 199-202, 218-19. Pertinent to Claim 6, this piercing assembly includes a slot with a row of teeth transverse to the belt direction to “pierce and engage”—i.e., engage—a belt end. Id. Regarding Claim 7, Kristbjarnarson’s piercing assembly is “a ridge member or row of pins transverse to the belt direction” to which the belt end can be fastened by gluing or heat melting. During examination of the ’532 Patent, the Examiner took Official Notice that “use of gluing techniques is well known for fastening pieces together.” Ex. 1022 at 9. Finally, with respect to Claim 8 Kristbjarnarson’s piercing assembly has a slot through which a loop of desired belt length is inserted to adjust and fix the belt length. Ex. 1012, figs. 3, col. 6 ll. 24-41 (describing how the belt ends are connected to piercing assemblies to create a RIP belt of desired length).
E. **Ground 5: Claims 1-3 Are Obvious Based on Gobron in View of Williams, Lawrence, or Sommer.**

Gobron teaches a connector for use with an electrocardiogram (ECG) unit—one of many types of electrode belts known to PHOSITAs (Ex. 1002 at 54)—to establish electrical connection between electrodes and/or sensors and a biomedical device. Ex. 1014 ¶0017. Gobron teaches male conductive pins 2 that are “forced through” and retained by keyhole slots 20 formed in a plastic plug body 7. *Id.* ¶¶0018-20. The keyhole slots 20 include features (ramps 16 and conductive cone 17) designed to facilitate “electrical connection between traces 11 [electrically connected to a flexible circuit 1] and pins 2.” *Id.* ¶0020. Thus, Gobron teaches an electrode connector with keyhole-shaped slots in a plastic body to facilitate mechanical and electrical connection between the male pins of a medical electronic device and electrical traces connected to a flexible circuit.

*Id.* fig. 1 (annotated); ¶¶0019-20.

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Pending Claim 1 of the ’532 Patent was rejected as anticipated by Gobron during prosecution. Ex. 1022 at 4-5. To gain allowance, Nox amended Claim 1 and argued that Gobron specifically did not teach a “conductor passing through the receiving hole while being wrapped around [an] engaging member [adjacent the receiving hole].” See Ex. 1023 at 5 & 11-12 (emphasis in original). In allowing the amended claims, the Examiner apparently did not consider prior art teaching that electromechanical connections of a conductor wrapped around an engaging member adjacent a receiving hole was already well-known and understood by PHOSITAs. Williams, Lawrence and Sommer are examples of such references. Ex. 1002 at 43-47.

Williams teaches a simple device to make physical and electrical connection between a ground wire (conductor) and a ground pipe (a male conductor inserted into the ground cap device). Ex. 1003, p. 1 ll. 11-20. Cap 2 includes bore (hole) sized to “fit snugly upon” the end of a conductive pipe. Id. ll. 67-70. The cap further includes features (grooves, slots, etc.) that receive a wire 3 (conductor) as it passes through the bore of the cap, while also wrapping around the wall of the cap (engaging member adjacent to the receiving hole), so that the wire is forced into contact with a lateral surface of the male portion of the pipe inserted into the cap. Id. ll. 70-94, fig. 2.
Lawrence teaches “new and useful improvements in electrical conductors” to easily secure and detach a wire (conductor) to a mating ground rod. Ex. 1004, p. 1 ll. 8-26. Lawrence teaches a collar (“thimble”) 4 with a bore (hole) having a groove 5 along the wall of the bore. Id. ll. 56-65, fig. 2. Lawrence further teaches that the wire is at least partially held in position because the “end of the wire . . . [has] its end turned up around the lower end of the thimble 4”—i.e., the wire is wrapped around an engaging member adjacent to a hole that the wire passes through. See id. at 78-89, fig. 1.
Finally, Sommer teaches a wire connector for making electrical connection with an electrical component inserted into a hole. Ex. 1007, Figs. 2-3. Sommer teaches a conductor (wire loop 6) passing through a hole in a carrier plate 1 and wrapping around the edge of the carrier plate and a bushing 5 (both engaging members adjacent the receiving hole). *Id.* As shown in Figures 2 and 3, the conductor (wire loop 6) engages a conductor (terminal wire 7) to make electrical contact with terminal wire 7 when it is inserted into the receiving hole of bushing 5.

![Image of Sommer's invention](image)

**Sommer, figs. 2-3.**

1. **Motivation to Combine**

PHOSITAs would combine Gobron with the teachings of Williams, Lawrence or Sommer for at least the reason that PHOSITAs consider and adopt well-known methods of making electrical connections in the development of biomedical devices. Ex. 1002 at 43-44. The basic design requirements of an electrode belt and connector are to encircle a patient’s body and to connect and conduct electrical current. *Id.* This has long been known and understood by PHOSITAs. *Id.* PHOSITAs well informed of the market and design demands for low-cost, mass-producible electrode
belts would consider and be motivated to incorporate basic and mature technology relating to electromechanical connections with predictable results. *Id.; KSR*, 127 S. Ct. at 1739.

2. **Claim 1**

*An electrode belt and a belt connector for electrically connecting a conductor of the electrode belt to a male portion of a snap connector electrode connected to a biometric device, the belt connector comprising:*

Gobron teaches “electrical connectors used to connect a single or multi-trace circuit to a separate electronic device,” including a biometric device such as an ECG apparatus. Ex. 1014 ¶¶0003-4, 0019. Gobron teaches “a keyhole-shaped electrical connector that is used to connect . . . a separate electronics device comprised of one or more fixed pins [e.g., male snap protrusion] which serve to mechanically secure the connection between the trace(s) and electrical contacts on the body.” Ex. 1014 ¶¶0017, 0019, figs. 1-5.

*a molded plastic frame including a receiving hole having radial flexibility, the receiving hole being configured to function as a female snap button fastener for receiving and fastening the frame to a protrusion of the male portion of the snap connector electrode,*

Gobron teaches an electrode connector with a plug portion 7 that “is comprised of a nonconducting plastic.” *Id.* ¶0019. As shown in Figure 1, “female plug portion 7” includes “keyhole shaped slots 20” which receive and fasten to “pins 2 located on the body of [a] separate electronics device.” *Id.* ¶0019, fig. 1. PHOSITAs knew
and understood that parts made of plastic like the “female plug portion 7” exhibit properties of elastic deformation—i.e., deform under load and return to their original form when the load is removed. Ex. 1002 at 106. Thus, PHOSITAs knew and understood that the “keyhole shaped slots 20” of the “female plug portion 7, which receive and fasten to pins 2, have radial flexibility. *Id.*

*a fastener configured to fasten the frame to a first end of said electrode belt, and*

Gobron teaches “double-sided foam adhesive 25 may be applied between the bottom surface 9 of plug 7 and flexible circuit 1 in order to retain the circuit on the bottom surface of the plug.” Ex. 1014 ¶0019. The flexible circuit taught by Gobron is understood by a PHOSITA to be a type of electrode belt. *Id.* ¶¶0017, 0019; Ex. 1002 at 106-07. Thus, Gobron teaches a fastener that fastens a belt to a connector frame.

*an engaging member adjacent to said receiving hole, the engaging member engaging the conductor of the electrode belt by the conductor passing through the receiving hole while being wrapped around the engaging member, such that when the male portion of the snap connector electrode penetrates the receiving hole, the conductor is forced into physical contact with at least a lateral surface of the male portion of the snap connector electrode,*

Gobron teaches a conductor 17 that is present on both sides of the female plug portion 7 and extends through the narrow portion 14 of keyhole slot 20. Ex. 1014 fig. 3A (showing cone structure 17 on the top surface 8 of plug portion 7); fig. 3B (showing cone structure 17 on the bottom surface 9 of plug portion 7). As noted
above, Gobron teaches that the male conductive pins 2 are “forced through narrower portion 14 such that the pins are restrictively secured in place.” *Id.* ¶0020.

Thus, Gobron teaches an engaging member (unlabeled portion of plug portion 7 that defines the narrow portion 14 of keyhole slot 20) that not only defines the receiving hole but is adjacent to the hole. Further, Gobron teaches that when pin 2 is inserted into portion 14 of the keyhole slot 20, the pin 2 “glides easily into electrical contact with cone structure 17”—i.e., at least a lateral surface of the male conductor (pin 2) is forced into contact with conductor (cone structure 17).

Williams, Lawrence, and Sommer teach the well-known and understood concept of wrapping a conductor around an engaging member adjacent a receiving hole, wherein the conductor passes through the hole and makes electrical contact with at least a lateral surface of a conductor inserted into the receiving hole. These references demonstrate that it was well-known to PHOSITAs to wrap a conductor around an engaging member adjacent a receiving hole wherein the conductor passes through the hole to make electrical contact with at least a lateral surface of a conductor inserted into the receiving hole. Ex. 1003, p. 1 ll. 27-32, fig. 2 (“Cap is also provided with a space . . . capable of accommodating a wire when the cap is placed upon the top of the pipe, and fitting so closely that a tight joint or connection is made between the wire and pipe.”); Ex. 1004, p. 1 ll. 70-83, fig. 1 (“[T]he wire . . . passe[s] through the groove 5 between the rod and thimble, and the lower end of
the wire is bent up . . . around the lower edge of the thimble 4.”); Ex. 1007, col. 2 ll. 43-57, fig. 3.

An express purpose of the electrical connector taught by Gobron is to make electrical connection between the male conductive pins 2 and the electrical traces 11 of the female plug portion 7 (each trace 11 corresponding to a trace of the flexible circuit/belt). Ex. 1014 ¶¶0019-20. Accordingly, it would be obvious to a PHOSITA to combine the teachings of Williams, Lawrence, or Sommer with the keyhole-shaped electrical connector taught by Gobron. Ex. 1002 at 104-109.

**wherein radial flexibility of said receiving hole is achieved by one or more slot extending from said hole, and wherein said receiving hole and one or more slot are formed by at least one elongated member having flexibility transverse to its longitudinal axis, thus imparting flexibility to the width of the hole.**

PHOSITAs knew and understood that plastic parts like Gobron’s “female plug portion 7” exhibit properties of elastic deformation—i.e., deform under load and return to original form when the load is removed. Ex. 1002 at 106. Thus, PHOSITAs knew and understood that the “keyhole shaped slots 20” of the “female plug portion 7” have flexibility, including in a direction transverse to a longitudinal axis. *Id.* Further, PHOSITAs knew and understood that the structure defining a hole will be more flexible when bounded by less material—i.e., structure bounding a hole having one or more slots extending from the hole, as taught by Gobron, is innately more flexible because less material bounds the hole. *Id.* at 109.
3. Claim 2

**The electrode belt and the belt connector of claim 1, wherein said belt connector further comprises a shield member which is arranged on a rear side of said frame to electrically shield the conductor of the electrode belt from the rear side exterior of the belt connector.**

Gobron teaches a connector with cover 12 that completely encloses the conductor of the electrode belt, such that the conductor is electrically shielded from a rear side exterior of the belt connector. See Ex. 1014 ¶¶0019, 0022, figs. 1, 6A, 6B (showing an alternate embodiment with a hinged cover that electrically shields the conductor from a rear side exterior of the belt connector).

4. Claim 3

**The electrode belt and the belt connector of claim 2, wherein said shield member is a sheet member extending from the frame, which sheet member is configured to be folded over onto the rear side of the frame to cover the back side of said receiving hole and engaged conductor.**

Gobron teaches an electrode connector with a cover attached to the frame by a hinge so it can fold over the rear side to cover the receiving hole and engaged conductor. Ex. 1014, ¶0022, figs. 6A, 6B.

F. **Ground 6: Claims 4 and 5 Are Obvious Based on the Claim 1 Grounds in View of Archer or Caldecott.**

Claims 4 and 5 depend from Claim 1, which is invalid based on the prior art as demonstrated in Sections VI.A.1 (Hermannsson), VI.B.2 (McIntire in view of Hermannsson), VI.C.2 (Harhen in view of Hermannsson), VI.D.2 (McIntire in view
of Kristbjarnarson or Linville), and VI.E.2 (Gobron in view of Williams, Lawrence, or Sommer) (collectively, “the Claim 1 Grounds”). Claims 4 and 5 add limitations related to a cover over the frame of the electrode connector of Claim 1. Archer and Caldecott teach well-known and understood technology related to protective coatings and insulating films; when added to any of the Claim 1 Grounds that invalidate independent Claim 1, these references render Claims 4 and 5 unpatentable under 35 U.S.C. § 103. See KSR, 127 S. Ct. at 1739.

Archer teaches a “connector for establishing electrical connection between a conductor and a patient engaging electrode” including a “[p]rotective covering 32 [having a] central opening 38 through which post [male fastener] 12 may be inserted.” Ex. 1008, Abstract; col. 2 ll. 45-48, fig. 3). Archer specifically teaches that the “protective coating functions to protect a person handling connector 18 from electric shock”—i.e., contact with the electrical conductor of the device. (Id. col. 2 ll. 51-53).

Similarly, Caldecott teaches that “polymer films are widely used . . . as barrier layers and interconnect layers when mounting integrated circuits and other devices onto or into packages.” Ex. 1015, p. 1 ll. 11-13. Caldecott further teaches that such “polymer films conventionally . . . require apertures at predetermined positions on the film to allow electrical connections to be made through the otherwise electrically insulating film.” Id. at ll. 13-16. Caldecott also teaches that such insulating films
often include “perforations” or “apertures” for use in a variety of applications, including in the medical field. *Id.* at ll. 18-24.

1. **Motivation to Combine**

The ’532 Patent admits that “existing standards for medical devices,” require electrode belts and connectors to “be configured such that a person wearing the belt . . . is insulated from current running through the belt.” ’532 Patent, col. 1 ll. 41-44. The Claim 1 Grounds teach the importance of protecting a patient from contacting an electrode belt conductor and the use of adhesive stickers to secure electrical leads to a connector body. Ex. 1017, col. 2 ll. 52-55; Ex. 1018 col. 7 ll. 46-50; *id.* col. 12 ll. 43-44. PHOSITAs knew and understood that medical device standards require that patients should be shielded from electrically conductive parts of the belt and connector. *See, e.g.*, Ex. 1002 at 130-31. Thus, PHOSITAs would be motivated to include the protective coating or insulating film taught by Archer or Caldecott with the electrode belt and connectors taught by each of the Claim 1 Grounds. *Id.* at 132-36, 140-145, 150-51; *see also KSR*, 127 S. Ct. at 1739.

2. **Claim 4**

The electrode belt and the belt connector of claim 1, wherein said belt connector comprises a cover enclosing the frame, which cover either includes a hole overlapping the receiving hole of the frame, or can be readily perforated by pressing the connector onto a male fastener which fits the receiving hole of the frame.
The Claim 1 Grounds teach the belt and belt connector of Claim 1. Archer and Caldecott each teach the additional limitations of Claim 4. Archer teaches a “connector for establishing electrical connection between a conductor and a patient engaging electrode” that includes a “[p]rotective covering 3[3] [having a] central opening 38 through which post [male fastener] 12 may be inserted.” Ex. 1008, Abstract; col. 2 ll. 45-48, fig. 3. The “protective coating functions to protect a person handling connector 18 from electric shock”—i.e., contact with the electrical conductor of the device. Id. col. 2 ll. 51-53. Caldecott teaches that insulating polymer films are used in a variety of industries including the medical field, and that such “polymer films conventionally . . . require apertures at predetermined positions on the film to allow electrical connections to be made through the otherwise electrically insulating film.” Ex. 1015, p. 1 ll. 11-20 (emphasis added).

PHOSITAs familiar with the “existing standards for medical devices” would be motivated to combine the “protective coating” taught by Archer or the “electrically insulating film” having “apertures at predetermined positions on . . . to allow electrical connections” taught by Caldecott with the Claim 1 Grounds to obtain a device meeting all the limitations of Claim 4. Ex. 1002 at 132-36, 140-145, 150-51. Being no more that the combination of familiar elements taught by the Claim 1 Grounds and either Archer or Caldecott, Claim 4 is rendered invalid as obvious by each of the Claim 1 Grounds in view of either Archer or Caldecott. Id.
3. Claim 5

The electrode belt and the belt connector of claim 4, wherein said cover is selected from the group consisting of a folded paper, plastic or fabric sticker, a plastic envelope and a textile envelope.

Claim 4 is invalid under each of the grounds discussed in Section VI.F.2. Archer and Caldecott teach the additional limitations of dependent Claim 5, rendering this claim invalid as obvious based on the same grounds. Archer teaches that the opening of an electrode connector can be covered with “any suitable elastomeric insulating material such as a soft vinyl rubber.” Ex. 1008, col. 2 ll. 46-50. Thus, Archer teaches and suggests to a PHOSITA the use of a cover of plastic sticker or envelope. Caldecott teaches the well-known use of insulating films that are adhesive backed and are labels—i.e., are plastic “stickers.” Ex. 1015, p. 1 ll. 11-16; p. 11 l. 29-p. 12 l. 2. Indeed, the Examiner rejected Claim 5 (Pending Claim 7) on the basis that “many plastic materials,” like those of Archer and Caldecott “are known to make such covers,” and selection of such a cover is an obvious design choice. Ex. 1022 at 7. Thus, for at least the reasons discussed above, including the existing requirement that patients be insulated from electrical current in medical devices admitted in the ’532 Patent, it would be obvious to a PHOSITA to combine Archer or Caldecott with any of the Claim 1 Grounds. Ex. 1002 at 153-55, 157-160, 161-63.
G. Ground 7: Claims 6-8 Are Obvious Based on the Claim 1 Grounds in Further View of Uehara, Abizaid, or Orewiler.

Claims 6-8 depend from Claim 1, which is invalid based on the Claim 1 Grounds as demonstrated in Sections VI.A.1, VI.B.2, VI.C.2, VI.D.2, and VI.E.2. Claims 6 and 7—which Petitioners submit are invalid as indefinite—appear to add limitations related to a slot and row of teeth or a ridge member and row of pins to fasten the belt of Claim 1. Claim 8 includes a limitation directed to a slot with a row of teeth, pins, or hooks to adjust the length of the belt of claim 1. Uehara, Abizaid, and Orewiler all teach these well-known methods of belt fastening and adjusting; when added to any of the Claim 1 Grounds that invalidate independent Claim 1, each reference renders Claims 6-8—to the extent they can be construed—unpatentable under 35 U.S.C. § 103.

Uehara teaches a “belt mounting structure in a buckle which can securely fix a belt in use and allows easy adjustment of an effective belt length and removal of the belt.” Ex. 1011, Abstract. Specifically, Uehara teaches that a buckle including a “belt mounting hole 12a is formed substantially in a rectangular shape, and an uneven surface 12b’ for eating into the belt 2 is formed on an inner surface of an upper end edge of a connection rod 12b disposed in the side opposite to the extending side of the insertion leg portion 14.” Id. col. 5 ll. 59-64, figs. 1-5.
Abizaid teaches a buckle for adjusting the length of webbing suspenders—i.e., woven belt material. Ex. 1005, p. 1 ll. 9-16. Abizaid’s buckle has cross bars 6 and 7 and “an open space 8, and the upper bar 6 [with] teeth 9 formed on its lower edge of such length that their ends project over the upper edge of the lower bar . . . .” Id. ll. 54-62, fig. 1. In use, the suspender webbing (belt) is engaged by “teeth 9 and be [sic] thereby pressed into the notches 10 so that it will be firmly gripped between the bars 6 and 7.” Id. ll. 82-93.

Orewiler teaches a buckle for adjusting the length of a webbing belt or strap, wherein the buckle has a slot having a “serrated clamping portion 19” along one edge. Ex. 1006, p. 1 ll. 94-96. In use, the “teeth of the prong portion . . . bite into the
fabric [of the belt passing through the slot] and resist any tendency of the same to slide through the buckle.” *Id.* at p. 2 ll. 20-28.

Orewiler, fig. 4.

1. **Motivation to Combine**

   The prior art identifies the market-driven desire for low-cost, mass-producible electrode belts that can adjust to a wide range of patient sizes. *Ex. 1002* at 52-55. One of the basic design requirements of a RIP electrode belt is that it adjusts to encircle and fit a part of a patient’s body—i.e., function like a belt. *Id.* Further, the prior art teaches that “any of various means can be used to make the length of the belt adjustable.” *Ex. 1017*, col. 2 ll. 9-13. A PHOSITA, well-informed of the market and design demands, would consider and be motivated to incorporate basic and mature technology relating to belt attachment and adjustment (buckles) like that taught by Uehara, Abizaid, and Orewiler into a single device having all of the limitations of claims 6-8. *See KSR*, 127 S. Ct. at 1739.

2. **Claims 6-8**

   To the extent Claims 6-8 can be construed, they are obvious in view of well-known buckles, like those taught by Uehara, Abizaid and Orewiler, that include a
slot with a row of teeth, pins or hook members transverse to a belt direction for adjusting and fastening (or fixing) a belt length. Ex. 1002 at 166-70, 177-184, 186-191, 199-208, 211-223.

With respect to Claim 6, Uehara teaches a buckle with a “belt mounting hole 12a [of] rectangular shape, and an uneven surface 12b’ for eating into the belt 2.” Ex. 1011, col. 5 ll. 59-61, figs. 1-5. Thus, Uehara teaches a slot (belt mounting hole 12a) with a row of teeth, pins or hooks (the projecting portions of uneven surface 12b’) transverse to the belt direction to engage a belt end. Indeed, this claim, as originally Pending Claim 8, was rejected based on Gobron in view of Uehara. Ex. 1022 at 8. It was ultimately allowed based on Nox’s amendments to Claim 1, which, as discussed above, is unpatentable over the prior art. Id.; Section VI.E. Abizaid and Orewiler also teach this limitation. Abizaid’s slot between crossbars 6 and 7 has a row of teeth 5 transverse to the belt direction to engage the belt end. Ex. 1005, p. 2 ll. 50-55 (describing crossbars 6 and 7 as “web-gripping jaws around which the webbing [i.e. belt] is secured”). Orewiler’s slot is formed between crossbars 12 and 13, and has a row of teeth 19 transverse to the belt direction to engage the belt end. Ex. 1006, fig. 4.

The limitations of Claim 7 are also taught by Uehara, Abizaid and Orewiler. See Ex. 1002 at 186-191, 199-208. The “uneven surface 12b’” of the buckle taught by Uehara is a ridge member or row of pins “to which a belt end can be fastened onto
with heat melting or gluing.” Ex. 1011, Abstract; see also id. col. 5 ll. 60-61. This claim (as Pending Claim 9) was rejected based on Gobron in view of Uehara during prosecution, with Uehara being cited for teaching a “ridge member or row of pins which lies transverse to the belt direction and to which a belt end can be fastened onto with heat melting or gluing.” Ex. 1022 at 8-9. For at least the same reason cited by the Examiner (“better engagement . . . of the belt”) it would have been obvious to a PHOSITA to fasten the belt end to all of the prior art buckles with melting or gluing and to include the teachings of Uehara with the Claim 1 Grounds. Similarly, the buckles of Abizaid and Orewiler include rows of teeth transverse to a belt direction to which “a belt end can be fastened onto with heat melting or gluing.” Ex. 1005 (Abizaid), fig. 1 (row of teeth 5); Ex. 1006 (Orewiler), fig. 4 (row of teeth 19).

With respect to Claim 8, the Claim 1 Grounds prior art teach electrode belts and connectors having the limitations of Claim 1 and the desire (and designs) to adjust the length of an attached electrode belt. Ex. 1017, col. 2 ll. 9-13, fig. 3a; Ex. 1012, col. 2 ll. 62-64, col. 8 ll. 24-26. Uehara, Abizaid and Orewiler teach prior art buckles having an adjustment slot with teeth through which a loop of belt can be inserted so as to adjust its length. In Uehara, “easy adjustment” of belt length is achieved by inserting a loop of desired length into the belt mounting hole (slot) and “eating into” the belt with teeth 12b’. Ex. 1011, Abstract, col. 5 ll. 59-64, figs. 1-5. In Abizaid, “[t]he lower edge of cross bar 2 is formed with teeth 5 which are adapted to take into
the webbing and thereby hold the buckle at the point to which it may be adjusted.” Ex. 1005, p. 1 ll. 33-42; p. 1 ll. 54-62; p. 1 ll. 82-93, fig. 1. Finally, in Orewiler, “the teeth of the prong surface 19 are extending in oblique downward position [so that in use] the teeth of the prong portion bite into the fabric and resist the tendency of the same to slide through the buckle.” Ex. 1006, p. 2 ll. 21-28; p. 1 ll. 94-96, fig. 4.

For at least the reasons discussed above, a PHOSITA would be motivated to combine well-known and understood mechanisms for adjusting and fastening a belt (as taught by Uehara, Abizaid, and Orewiler) with the Claim 1 Grounds, rendering Claims 6-8 invalid as obvious. See Ex. 1002 at 166-70, 177-184, 186-191, 199-208, 211-223.

H. Ground 8: Claims 9 and 13 Are Obvious Based on Claim 1 Grounds in Further View of Kristbjarnarson or Linville.

Claims 9 and 13 depend from Claim 1, which is invalid based on the prior art. See Sections VI.A.1, VI.B.2, V.C.2, V.D.2 & V.E.2. Claims 9 and 13 add limitations related to the electrode belt being a flexible textile belt with an electrode wire interwoven in or laminated between layers in the belt and wherein the conductor of the electrode belt is an electrode wire. Kristbjarnarson and Linville (see Section VI.D) both teach these features in an electrode belt; when either reference is added to the Claim 1 Grounds, the resulting combination renders claims 9 and 13 unpatentable under 35 U.S.C. § 103. See KSR, 127 S. Ct. at 1739.
1. Motivation to Combine

A PHOSITA would combine the Claim 1 Grounds with Kristbjarnarson or Linville for at least the reason that Claim 1 Grounds are based on prior art electrode belt connectors and methods of connecting belts to such connectors; including admittedly known RIP belts, known and understood to PHOSITAs to have the limitations of Claims 9 and 13. Ex. 1002 at 223-24, 226-230, 232-235; ’532 Patent, col. 1 ll. 12-16.

2. Claim 9

The electrode belt and the belt connector of claim 1, wherein said belt is a flexible textile belt with an electrode wire interwoven in the belt or laminated between two layers of the belt.

Kristbjarnarson and Linville each teach an electrode belt and belt connector with a flexible textile belt and an electrode wire interwoven in the belt or laminated between two layers of the belt. Section VI.D.4. Indeed, the Examiner recognized this; Claim 9 (originally Pending Claim 14) was rejected based on Gobron in view of Kristbjarnarson before it was ultimately allowed based on Nox’s amendments to Claim 1. Ex. 1022 at 10.

3. Claim 13

The electrode belt and the belt connector of claim 1, wherein the conductor of the electrode belt is an electrode wire.

Kristbjarnarson and Linville both teach electrode belts with a wire in the belt that is a conductor. Section VI.D.5.
VII. CONCLUSION

The grounds above, supported by the opinions of Dr. Williams, demonstrate that
Claims 1-9 and 13 of the ’532 Patent are unpatentable as anticipated or obvious.
Petitioners have therefore established a reasonable likelihood of prevailing on each
ground set forth in this Petition, and respectfully request that the Board institute a
trial based on the stated grounds. The undersigned authorizes the Office to charge
Deposit Account No. 506271 for the fee set forth in 37 C.F.R. § 42.15(a), and any
other applicable fees in connection with this Petition.

Respectfully submitted,

By: /Thomas S. Reynolds II/
Thomas S. Reynolds II
(Registration No. 45,262)
CERTIFICATE OF COMPLIANCE

In accordance with 37 C.F.R. § 42.24, the undersigned certifies that this Petition complies with the applicable type-volume limitation of 37 C.F.R. § 42.24 (a) (i). Exclusive of the portions exempted by 37 C.F.R. § 42.24 (a), this Petition contains 13,948 words as counted by the word processing program used for its preparation (Microsoft Word 2013).

Dated: September 15, 2016

By: /Thomas S. Reynolds II/
Thomas S. Reynolds II
(Registration No. 45,262)
CERTIFICATE OF SERVICE

The undersigned hereby certifies that a copy of this Petition, along with all exhibits and other documents filed together with this Petition, has been served in its entirety on the Patent Owner as required by 37 C.F.R. §§ 42.6 and 42.105. A copy of this Petition along with all exhibits and other documents filed together with this Petition was served via Priority Mail Express®, or by means at least as fast and reliable as Priority Mail Express®, on the following counsel record for the patent owner of U.S. Patent No. 9,059,532 Patent at the below listed address:

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