

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ADVANTAGE MEDICAL ELECTRONICS, LLC and
LIFESYNC CORPORATION,
Petitioner,

v.

KPR U.S., LLC,
Patent Owner.

IPR2022-01343
Patent 8,795,004 B2

Before BARBARA A. PARVIS, KEVIN C. TROCK, and
JULIET MITCHELL DIRBA, *Administrative Patent Judges*.

PARVIS, *Administrative Patent Judge*.

DECISION
Denying Institution of *Inter Partes* Review
35 U.S.C. § 314; 37 C.F.R. § 42.4

I. INTRODUCTION

Advantage Medical Electronics, LLC¹ and LifeSync Corporation (collectively “Petitioner”) filed a Petition (Paper 3 (“Pet.”)) requesting an *inter partes* review of claims 1, 2, 4–11, 13, 14, 16, and 17 (“challenged claims”) of U.S. Patent No. 8,795,004 B2 (Ex. 1001, “the ’004 patent”). KPR U.S., LLC (“Patent Owner”) filed a Preliminary Response. Paper 9 (“Prelim. Resp.”).

We have authority to determine whether to institute review under 35 U.S.C. § 314 and 37 C.F.R. § 42.4.

Upon consideration of the arguments and the evidence of record, we conclude Petitioner does not establish a reasonable likelihood of prevailing in demonstrating the unpatentability of any of the challenged claims of the ’004 patent. Accordingly, we do not institute an *inter partes* review.

II. Background

A. *Real Parties-in-Interest*

Petitioner identifies Advantage Medical Electronics, LLC and LifeSync Corporation as real parties-in-interest. Pet. 1–2. Patent Owner names itself as the real party-in-interest. Paper 8, 1. Patent Owner further states the real parties-in-interest “may include” Cardinal Health 200, LLC, InnerDyne Holdings, Inc., Allegiance Corp., and Cardinal Heath, Inc. *Id.*

B. *Related Matters*

The parties identify *KPR U.S., LLC et al. v. LifeSync Corp. et al.*, No. 0:22-cv-60468-RAR (S.D. Fla.) as a related matter. Pet. 2–3; Paper 8, 1.

¹ Petitioner states that Advantage Medical Electronics, LLC is “known more commonly as ‘Advantage Medical Cables’ (‘AMC’).” Pet. 1.

Petitioner also has filed a petition for *inter partes* review of U.S. Patent No. 8,038,484 B2 (IPR2022-01344).

C. The '004 Patent

The '004 patent “relates to biomedical electrodes, and in particular, to a biomedical electrode connector for attaching a lead wire to an electrocardiogram (ECG) electrode placed on a patient's body.” Ex. 1001, 1:23–26. The '004 patent explains that a clinician affixes an electrode pad to a patient’s body using a biocompatible conductive gel or adhesive and attaches an ECG lead wire connector to a press stud of the pad “by pressing or ‘snapping’ the lead wire connector onto the bulbous press stud to achieve mechanical and electrical coupling of the electrode and the lead wire.” *Id.* at 1:43–46, 1:50–56. After use, the clinician removes “the ECG lead wire connector from the pad by pulling or ‘unsapping’ the connector from the pad.” *Id.* at 1:56–58. The '004 patent explains that this process may have drawbacks because “[a] clinician must apply considerable downward force on the lead wire connector to achieve positive engagement of the connector to the press stud,” which may cause discomfort or pain to the patient. *Id.* at 1:59–62. Also, “[u]pon completion of the ECG procedure, a clinician must unsnap the ECG lead wire connector from the pad, which may further cause discomfort to the patient.” *Id.* at 2:1–3. Also, when a snap lock connector is used, it “may engage the press stud with insufficient force, which may cause suboptimal signal transmission.” *Id.* at 2:17–19.

The '004 patent describes “an ECG electrode lead wire connector which provides improved electrical and mechanical coupling of the ECG electrode press stud to the lead wire, provides enhanced ergonomics to the clinician, and may alleviate patient discomfort associated with the attachment and removal of ECG leads.” *Id.* at code (57). The '004 patent

explains that its “connectors may also decrease clinician fatigue, and may provide more reliable ECG results.” *Id.*

The '004 patent describes an ECG electrode connector having a pivoting lever pushbutton, which is shown in Figure 7 below. *Id.* at 5:7–10.

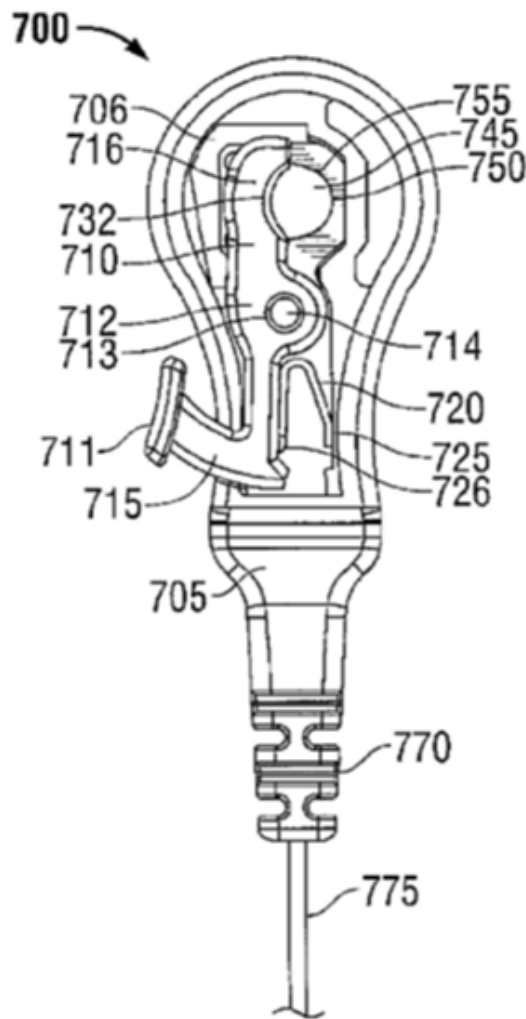


FIG. 7

Figure 7, above, is a schematic diagram of ECG electrode connector 700 having, among other things, housing 705 and lever 710 in a released position. *Id.* at 5:7–10, 8:30–33.

Housing 705 provides cavity 706. *Id.* at 8:32. Lever 710 has actuating end 715, external pushbutton face 711, pivot 712, and engaging region 716. *Id.* at 8:32–35.

Connector 700 further includes electrical contact member 755, which is disposed upon cavity 706. *Id.* at 8:52–53. Contact member 755 is electrically coupled to lead wire 775 by any suitable manner of connection. *Id.* at 8:53–55. Contact member 755 provides contact opening 745 defined therein to accept an electrical contact, such as a press stud, and may be an asymmetrical shape having narrow end 750 and wide end 751. *Id.* 8:57–61.

Figure 9B, below, illustrates a bottom view of ECG electrode connector 700. *Id.* at 5:17–19.

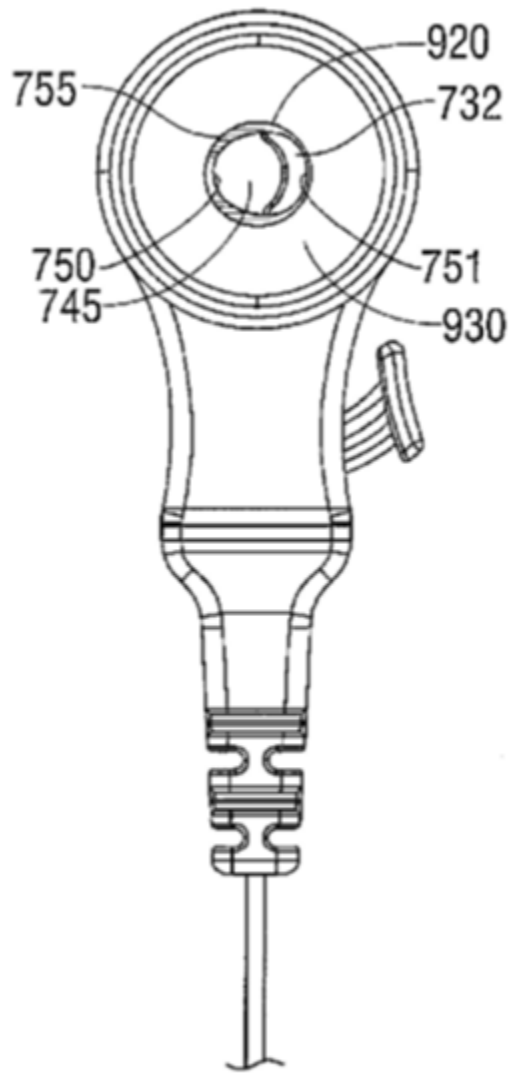


FIG. 9B

Figure 9B, above, illustrates a bottom view of ECG electrode connector 700. *Id.* at 5:17–19.

As shown in Figure 9B, housing 705 of ECG electrode connector 700 has bottom surface 930, which provides aperture 920 disposed therein. *Id.* at 8:62–63. Aperture 920 exposes contact opening 745 to the exterior of

connector 700 to facilitate insertion of a press stud into connector 700. *Id.* at 8:63–65.

D. Illustrative Claim

Petitioner challenges claims 1, 2, 4–11, 13, 14, 16, and 17 of the '004 patent. Pet. 1, 3–4, 23–69. Claims 1 and 13 are the independent claims. Claims 2 and 4–11 depend directly from claim 1 and claims 14, 16 and 17 depend directly from claim 13. Independent claim 1, reproduced below, is illustrative of the claimed subject matter.

1. An ECG connector assembly, comprising:
 - a housing having a first opening dimensioned to receive a press stud of an ECG electrode pad;
 - an electrical contact member fixed to the housing and defining a contact plane and having a second opening smaller than and disposed at least partially within the first opening; and
 - a lever pivotable about an axis orthogonal to the contact plane and having at least an engaged position and a disengaged position, wherein the lever comprises an actuating portion, an engaging region, and a pivot, the engaging region configured to operably engage the press stud to cause a portion of the press stud to contact the electrical contact member when the lever is in the engaged position.

Ex. 1001, 10:26–40.

E. Evidence

Petitioner relies on the patent document references summarized in the table below.

Name	Patent Document	Exhibit
Sessions	US 3,740,703, issued June 19, 1973	1006
Fukuda	JP 9-276239, published Oct. 28, 1997	1007 ²
Christensson	US 5,944,562, issued Aug. 31, 1999	1008
Powell	US 7,214,107 B2, issued May 8, 2007	1009

Petitioner also relies on the Declaration of Terry Layton, Ph.D. (Ex. 1002) as supporting its contentions that the challenged claims are unpatentable. Patent Owner relies on the Declaration of Robert T. Stone, Ph.D. (Ex. 2001).

F. Asserted Grounds

Petitioner asserts that the challenged claims of the '004 patent are unpatentable based on the following grounds summarized in the table below:

² Exhibit 1007 includes a copy of Fukuda's Japanese publication and an English translation of the publication. Herein, we refer to the English translation.

Claims Challenged	35 U.S.C. § ³	References/Basis
1, 2, 4–8, 10, 11, 13, 14, 16, 17	103(a)	Fukuda, Christensson, Sessions
9	103(a)	Fukuda, Christensson, Sessions, Powell

III. ANALYSIS

A. Legal Standards

To prevail in its challenge, Petitioner must demonstrate that the claims are unpatentable and that burden never shifts to the patentee. *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015). A patent claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) when in evidence, objective evidence of nonobviousness, i.e., secondary considerations.⁴ *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

³ Because the challenged claims of the ’004 patent have an apparent effective filing date before March 16, 2013, the 35 U.S.C. §§ 102 and 103 provisions of the Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112–29, §§ 3(b)–3(c), 3(n)(1), 125 Stat. 284, 285–87, 293 (2011) do not apply. Our analysis would not change under the AIA versions of §§ 102, 103.

⁴ Patent Owner does not present objective evidence of nonobviousness.

B. Level of Ordinary Skill in the Art

Petitioner asserts that a person of ordinary skill in the art the time of the invention “would have had education and/or experience in the biological sciences, engineering, or medical device manufacturing and/or design along with knowledge of the scientific literature in the field” and “[a]lthough education and experience levels may vary, a POSITA [person of ordinary skill in the art] would have had at least a bachelor’s degree in bioengineering, biomedical engineering, or equivalent.” Pet. 6 (citing Ex. 1002 ¶ 31). Petitioner further asserts:

As of the earliest effective filing date of the ’004 patent claims, a POSITA also would have had work experience in the field of medical devices or medical test instruments, including several years of experience designing connectors or attachment mechanisms for medical devices or medical test instruments. (*Id.* at ¶34.) A person holding only a bachelor’s degree would be required to have had three (3) years of relevant work experience to qualify as a POSITA, but a person with a more advanced degree, such as a master’s of science or doctorate, could qualify as a POSITA with fewer years of experience.

Id. (citing Ex. 1002 ¶ 34).

Patent Owner disputes Petitioner’s level of skill. Prelim. Resp. 18–19 (citing Ex. 2001 ¶¶ 89, 91). Patent Owner, however, also contends that “the precise definition of a POSITA does not affect the outcome, and institution should be denied regardless of which definition of a POSITA is adopted.” *Id.* at 19.

We find that the phrase “at least” in Petitioner’s proposed definition creates a vague, open-ended upper bound for the level of ordinary skill, and we, therefore, do not adopt that aspect of the proposal. We agree with Patent Owner that Petitioner has not made a sufficient showing regardless of which definition we adopt.

Accordingly, for purposes of this Decision, with the exception of the “at least” terminology noted above, we use Petitioner’s assessment of the level of skill for one of ordinary skill in the art in our analysis below.

C. Claim Construction

We construe the challenged claims by applying the standard used in federal courts, in other words, “the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. [§] 282(b),” which is articulated in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). 37 C.F.R. § 42.100(b). Under this standard, the words of a claim generally are given their “ordinary and customary meaning,” which is the meaning the term would have to a person of ordinary skill at the time of the invention, in the context of the entire patent including the specification. *Phillips*, 415 F.3d at 1312–13.

Petitioner provides proposed constructions for sixteen terms. Pet. 14–22. Only four terms are relevant to the disputes we address in this Decision. Those four terms and Petitioner’s proposed constructions are set forth below.

Term	Petitioner’s Proposed Construction
“first opening”	Petitioner argues the “specification identifies the ‘first opening’ in the housing as the aperture 320, 620, 920 that starts at the bottom surface 330, 630 and 930 of the housing 105, 405, 705 extending upwardly through the width of the bottom portion of the housing as shown in Fig. 3D.” Pet. 14 (citing Ex. 1001, 7:3–7, 7:66–8:3, 8:62–65.) Petitioner argues the “term ‘first opening’ is construed to mean the same as the aperture, or a hole extending through the bottom wall of the housing from the bottom surface of the housing to the inner surface of the bottom wall that is sized to allow a press stud to extend therethrough.” <i>Id.</i> at 15 (citing Ex. 1002 ¶ 49).

“second opening”	Petitioner argues the “specification identifies the opening in the electrical contact member as being the contact opening.” Pet. 17 (citing Ex. 1001 6:63–65, 7:62–66, 8:57–63.) Petitioner argues the “term ‘second opening’ is construed to mean the same as the contact opening, or a hole extending through the electrical contact member.” <i>Id.</i>
“at least partially within the first opening”	Petitioner argues the “term ‘at least partially within the first opening’ is construed to mean that the opening in the electrical contact member is smaller than the opening in the housing and is positioned at least partially inside of the opening, between the inner and bottom surfaces of the bottom wall of the housing.” Pet. 18 (citing Ex. 1002 ¶ 55).
“at least partially exposed within the aperture”	Petitioner argues the “term ‘as least partially exposed within the aperture’ is construed to mean that the opening in the electrical contact member is positioned at least partially inside of the aperture, between the inner and bottom surfaces of the bottom wall of the housing.” Pet. 21–22 (citing Ex. 1002 ¶ 64).

Patent Owner disputes Petitioner’s constructions and characterizes them as “impermissibly narrow.” Prelim. Resp. 19. Patent Owner also argues “the deficiencies in the Petition remain regardless of how the claim terms are construed.” *Id.* at 20.

We agree with Patent Owner that Petitioner has not made a sufficient showing even using Petitioner’s proposed constructions. Accordingly, for purposes of this Decision, we use Petitioner’s proposed constructions in our analysis below.

D. Unpatentability of Claims 1, 2, 4–8, 10, 11, 13, 14, 16, and 17 under 35 U.S.C. § 103(a) as Obvious over Fukuda, Christensson, and Sessions

Petitioner asserts that claims 1, 2, 4–8, 10, 11, 13, 14, 16, and 17 are unpatentable as obvious over Fukuda, Christensson, and Sessions. Pet. 4. Patent Owner presents arguments contesting Petitioner’s ground. Prelim. Resp. 20–62.

We begin with an overview of Fukuda, Christensson, and Sessions. We then turn to the parties’ contentions.

1. Fukuda

Fukuda regards a “bio contact electrode device used to transmit the cardiac action potential to a monitoring device such as an electrocardiograph.” Ex. 1007 ¶ 1. Figure 1 of Fukuda illustrates connector 1. *Id.* ¶¶ 11, 29.

FIG.1

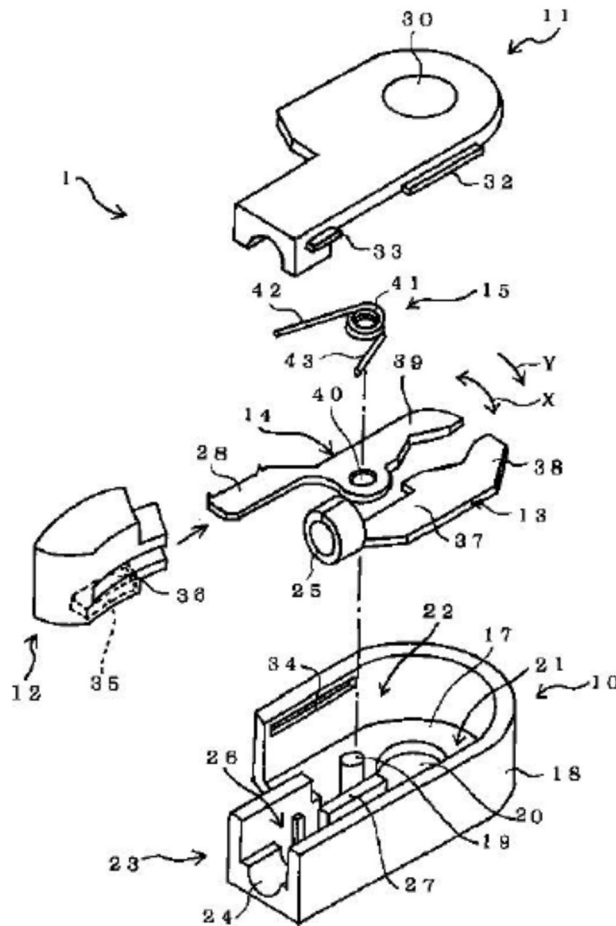


Figure 1, above, illustrates connecting tool 1 that includes base member 10, cover member 11, holding member 12, and contact members 13, 14. *Id.*

¶ 11.

Fukuda's connecting tool 1 includes base member 10, cover member 11, holding member 12, first contact member 13, second contact member 14, and spring 15. *Id.* ¶ 11. Fukuda states that "[e]ach member of the insulating part is formed by plastic molding" and that base member 10 includes receiving hole 20 for receiving terminal portion 5 of a contact electrode. *Id.*

¶ 12.

Figure 5 of Fukuda illustrates an external view of connecting tool 1.
Id. ¶¶ 24, 29.

FIG.5

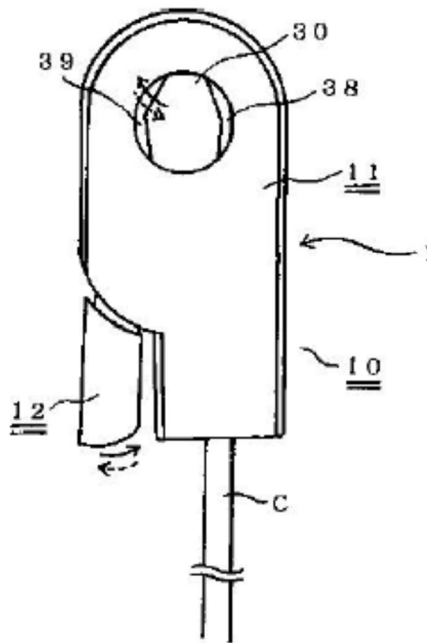


Figure 5, above, illustrates connecting tool 1 with holding members 38, 39 visible through opening portion 30. *Id.* ¶ 24.

Fukuda explains that when holding member 12 is pressed, as indicated by the solid arrow in Figure 5, holding members 38, 39 open and terminal portion 5 can be inserted into opening portion 30. *Id.* Holding member 12 is then released and returns to the position shown in Figure 5, as indicated by dotted arrow. *Id.* Holding members 38, 39 also return, causing the terminal portion to be clamped between holding members 38, 39. *Id.*

2. Christensson

Christensson “relates to improved electrical clasp structures for transferring biomedical electrical signals.” Ex. 1008, 1:10–11. Figure 4 of Christensson illustrates a side view of clasp 20.

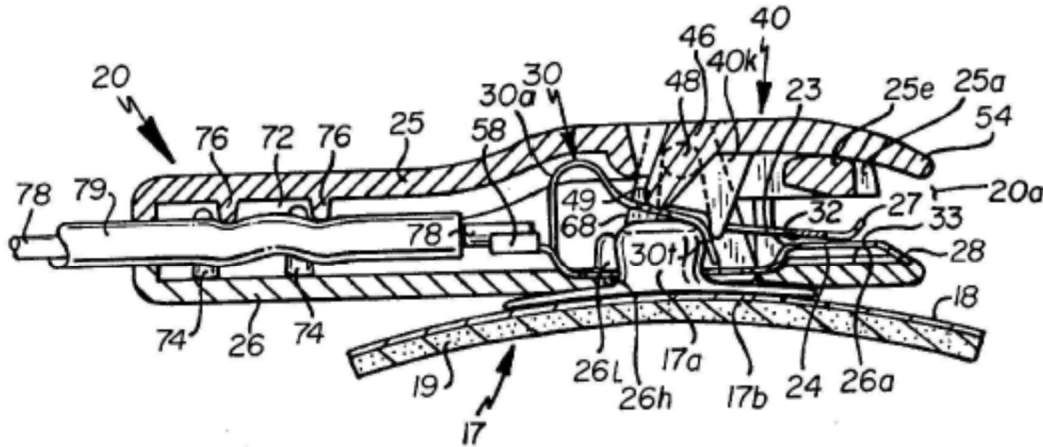


Fig. 4

Figure 4, above, illustrates a sectional view of clasp 20 closed and engaged with snap-type electrode 18. *Id.* at 2:65–68, 6:45–48.

Clasp 20 includes flat leaf spring 30 with a pair of elongated arms 23, 24 that serve as jaws and have electrical contact surfaces 32, 33. *Id.* at 4:14–18. Christensson states that contact surfaces 32, 33 are biased to an open, spaced apart relationship via spring 30. *Id.* at 4:18–20. As a result, jaws 23, 24 will admit the insertion of tab 16 with arms 23, 24 being configured to grasp signal transfer tab 16. *Id.* at 4:21–23, 4:31–33. Clasp 20 also includes jaw operating lever 40 that rotates about pivot 48. *Id.* at 4:46–50. When lever 40 is in a down position, as depicted in Figure 4, electrode 12 is gripped tightly between contact surfaces 32, 33. *Id.* at 4:49–52.

Clasp 20 further includes oblong opening 26h, which is slightly larger at its forward end. *Id.* at 6:34–36. Aligned above opening 26h is opening 30h in lower arm 24 of spring 30. *Id.* at 6:37–39. The forward portion of opening

26h and the forward portion of the opening 30h of the spring 30 are large enough to accommodate stud 17a of snap-type electrode 18. *Id.* at 6:45–48.

3. Sessions

Sessions relates “to a terminal clip for connecting an electrical conductor of electromedical equipment or the like to an electrode or other structure, particularly for electrodes adapted to be attached to the skin of a patient.” Ex. 1006, 1:4–8. Figure 4 of Sessions, below, illustrates electrode structure 1 with terminal clip 17 mounted thereon. *Id.* at 3:10–12, 3:18–19, 3:25–27, 4:10.

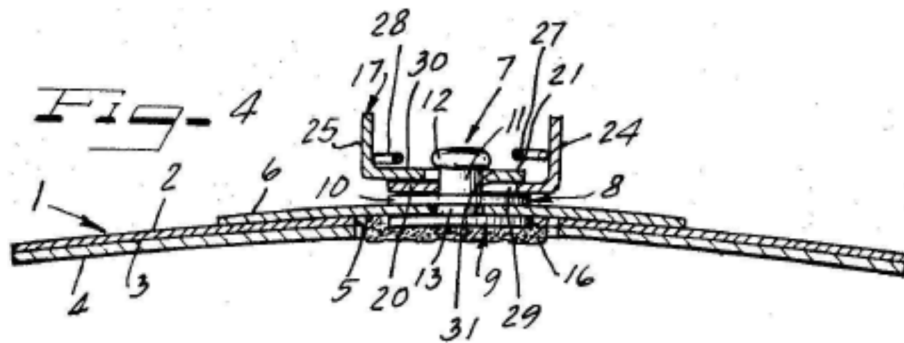


Figure 4, above, illustrates a sectional view of electrode structure 1 with terminal clip 17 mounted thereon. *Id.* at 3:10–12, 3:18–19, 3:25–27, 4:10.

Electrode structure 1 includes disc shaped base member 2, which is provided with central opening 5 covered by smaller disc 6. *Id.* at 3:25–36. Secured to disc 6 is electrical terminal structure 7. *Id.* at 3:37–39. Terminal clip 17 includes a pair of members 18, 19 that form base plates 20, 21 that pivot via stud member 22. *Id.* at 4:10–15.

4. Independent Claim 1

- a) *Element 1.3: “and having a second opening smaller than and disposed at least partially within the first opening”*

Petitioner argues “Christensson teaches an ECG connector assembly (clasp 20) having a second opening 30h smaller than and disposed at least

partially within the first opening 26h (as shown in Fig. 3 and 7.).” Pet. 29; *see also* Ex. 1002 ¶ 93 (testimony in the Declaration of Dr. Layton with the same statement). The Petition includes the following quote from Christensson.

Near the center of the bottom portion 26 of the clasp 20 is an oblong opening 26h which is slightly larger at its forward end as shown in FIG. 7. Around the opening 26h is an upwardly and centrally tapered surface 26h'. Aligned above it is a similarly shaped opening 30h in the lower arm 24 of the spring 30.

Pet. 29 (quoting Ex. 1008, 6:34–39).

Petitioner’s argument that Christensson teaches two openings, i.e., first opening 26h and second opening 30h is consistent with and supported by the text of Christensson. Claim 1, however, requires “a second opening smaller than and disposed at least partially within the first opening” and those requirements are not supported by the quote of Christensson relied on by Petitioner. Contrary to Petitioner’s argument that Christensson describes that the second opening is smaller than the first opening (Pet. 28–29), the quote of Christensson describes only “oblong opening 26h” and “*similarly shaped* opening 30h.” Ex. 1008, 6:34–39 (emphasis added). Contrary to Petitioner’s argument that Christensson describes that the second opening is “disposed at least partially within the first opening” (Pet. 28–29), the quote of Christensson describes that opening 30h is “[a]ligned above” opening 26h. Ex. 1008, 6:34–39 (emphasis added).

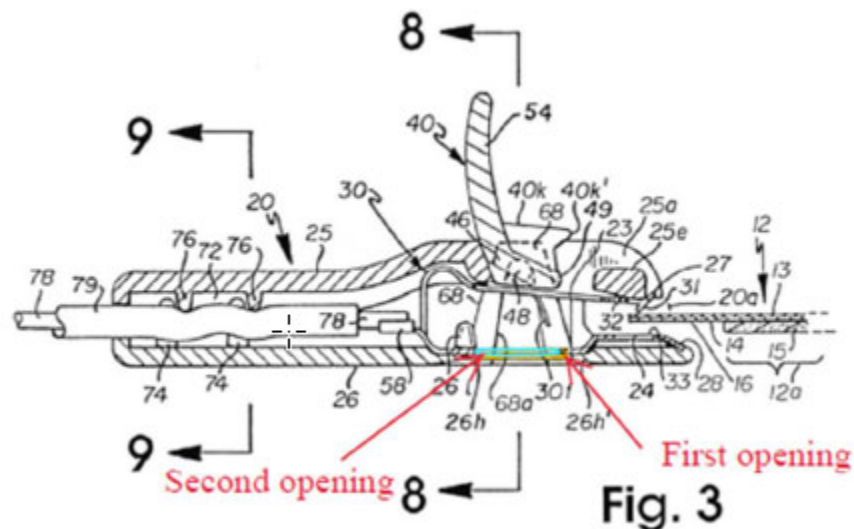
Petitioner does not emphasize the portion of the quote of Christensson that describes opening 26h as “slightly larger at its forward end.” Ex. 1008, 6:34–39. Also, Petitioner relies on the entirety of opening 26h as meeting the “first opening” limitation, not just the forward end portion. *See, e.g.*, Pet. 29. For completeness, however, we note that the forward end portion of the first

opening does not satisfy Petitioner’s construction of “first opening,” which is “the aperture, or hole extending through the bottom wall of the housing from the bottom surface of the housing to the inner surface of the bottom wall that is sized to allow a press stud to extend therethrough.” Pet. 15 (citing Ex. 1002 ¶ 49).

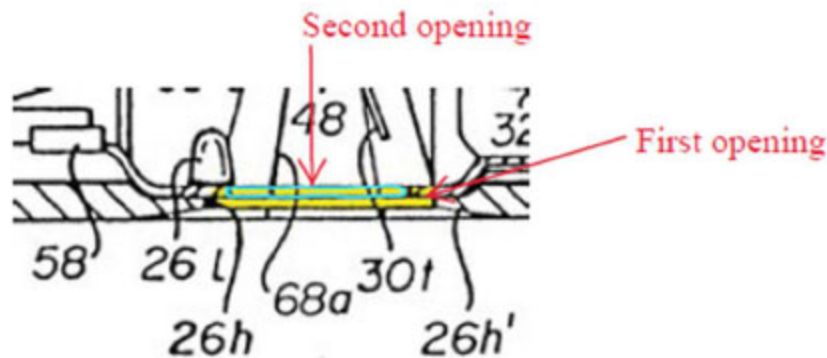
Accordingly, Petitioner’s arguments regarding the size and position of Christensson’s second opening are not supported by the quote of Christensson. Neither Petitioner nor Dr. Layton rely on any other text in Christensson for showing element 1.3. Pet. 28–30; Ex. 1002 ¶¶ 93–94.

Petitioner also relies on Figures 3 and 7 in Christensson for showing element 1.3. Pet. 29–30 (citing Ex. 1002 ¶ 94). The Petition and Dr. Layton’s Declaration include the same annotated versions of Figures 3 and 7 of Christensson that are relied on in support of Petitioner’s position.

We start with Petitioner’s annotated versions of Figure 3 of Christensson, reproduced below.



Petitioner's blue highlighting of a sliver above, as well as Petitioner's red textual annotation of "First opening" with a red arrow pointing to the yellow highlighted sliver and Petitioner's red textual annotation of "Second opening" with a red arrow pointing to the blue highlighted sliver. Ex. 1008, 3:61–64, 4:10–11, Fig. 3; Pet. 29.



The partial view of Figure 3 of Christensson, above, is Petitioner's enlarged portion of Petitioner's annotated Figure 3 showing just the yellow highlighted sliver and the blue highlighted sliver and parts of other adjacent elements of clasp 20, as well as Petitioner's red textual annotation of "First opening" with a red arrow pointing to the yellow highlighted sliver and Petitioner's red textual annotation of "Second opening" with a red arrow pointing to the blue highlighted sliver. Ex. 1008, 3:61–64, 4:10–11; Pet. 29.

Dr. Layton testifies "[a]nnotated Fig. 3 of Christensson [] shows the second opening (defined by the light blue box) being smaller than and disposed within the first opening (highlighted in yellow)." Ex. 1002 ¶ 94. Dr. Layton also testifies "[a]n enlarged partial view of annotated Fig. 3 showing the second opening within the first opening is shown below." *Id.* Dr. Layton's Declaration next includes the annotated versions of Figure 3 reproduced above. *Id.*

Patent Owner argues Petitioner “self-servingly” highlights “vague slivers” of Figure 3. Prelim. Resp. 58. Patent Owner argues, for example, Petitioner relies “on element ‘30h’ as disclosing the smaller of the two openings, but the annotated Figure 3 fails to depict this element.” *Id.* Patent Owner submits the testimony of Dr. Stone that Figure 3 does not “clearly demonstrate the relative sizes of the openings.” Ex. 2001 ¶ 153. Dr. Stone testifies in his opinion, a person having ordinary skill in the art “reading Christensson would not necessarily interpret openings 26h and 30h to have different sizes than one another — only that they are ‘similarly shaped’ and are both present in the connector.” *Id.* ¶ 154.

“[T]hings patent drawings show clearly are not to be disregarded.” *In re Mraz*, 455 F.2d 1069, 1072 (CCPA 1972). However, “patent drawings do not define the precise proportions of the elements and may not be relied on to show particular sizes if the specification is completely silent on the issue.” *Hockerson-Halberstadt, Inc. v. Avia Grp. Int’l, Inc.*, 222 F.3d 951, 956 (Fed. Cir. 2000). “Consideration of what the drawings conveyed to persons of ordinary skill is essential.” *Vas-Cath, Inc. v. Mahurkar*, 935 F.2d 1555, 1566 (Fed. Cir. 1991) (citing *Ralston Purina Co. v. Far-Mar-Co., Inc.*, 772 F.2d 1570, 1575 (Fed. Cir. 1985)).

“*Inter partes* review shall not be instituted unless the Board decides that the *information presented in the petition* demonstrates that there is a reasonable likelihood that at least one of the claims challenged in the petition is unpatentable.” 37 C.F.R. § 42.108(c) (emphasis added). “The Board’s decision will take into account a patent owner preliminary response where such a response is filed, *including any testimonial evidence.*” *Id.* (emphasis added). We, therefore, consider the arguments and evidence presented in the Petition, including the testimony of Dr. Layton, as well as

the arguments and evidence in the Preliminary Response, including the testimony of Dr. Stone, in determining what the drawings of Christensson would have conveyed to a person having ordinary skill in the art.

We give credit and significant weight to the testimony of Dr. Stone regarding Figure 3 (Ex. 2001 ¶¶ 153–154) over the testimony of Dr. Layton (Ex. 1002 ¶¶ 93–94) because we find that Dr. Stone’s testimony is consistent with Christensson’s disclosures and we find that Dr. Layton’s testimony (Ex. 1002 ¶¶ 93–94) is conclusory. *See Xerox Corp. v. Bytemark, Inc.*, IPR2022-00624, Paper 9 at 15–16 (Aug. 24, 2002) (precedential). For instance, consistent with Patent Owner’s argument and Dr. Stone’s testimony, Figure 3 does not include reference number 30h. Ex. 1008, Fig. 3. Additionally, Dr. Layton testifies that the “second opening” is “defined by the light blue box,” but Dr. Layton’s testimony in his Declaration does not disclose facts or data that Dr. Layton relies on in forming his opinion that second opening 30h is the sliver in Figure 3 highlighted in blue. Ex. 1002 ¶ 94. “Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.” 37 C.F.R. § 42.65 (a).

We turn to Petitioner’s annotated version of Figure 7 of Christensson, reproduced below.

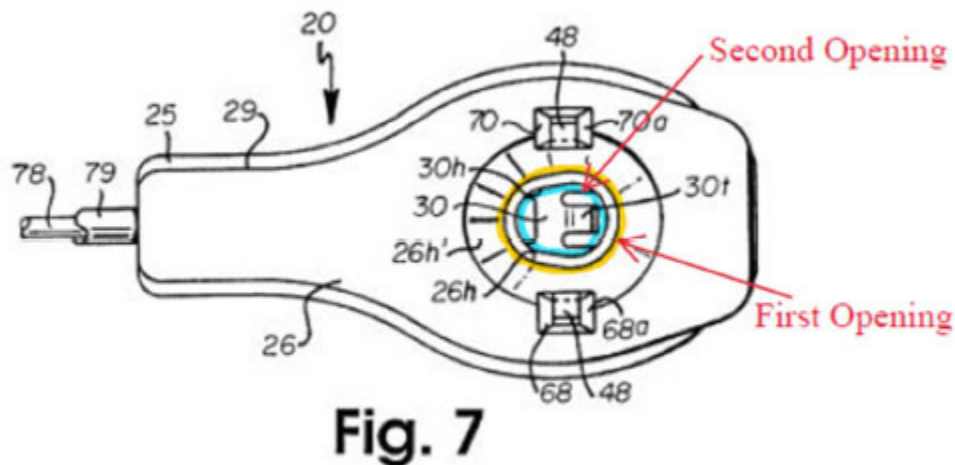


Figure 7 of Christensson, above, is a bottom view of clasp 20 that includes Petitioner’s yellow highlighting of an outer circle and Petitioner’s blue highlighting of an inner circle, as well as Petitioner’s red textual annotation of “First Opening” with a red arrow pointing to the yellow highlighted circle and Petitioner’s red textual annotation of “Second Opening” with a red arrow pointing to the blue highlighted circle. Ex. 1008, 3:6, 6:34–36, Fig. 7; Pet. 30.

Dr. Layton testifies “Christensson teaches an ECG connector assembly (clasp 20) having a second opening 30h smaller than and disposed at least partially within the first opening 26h (as shown in Figs. 3 and 7).” Ex. 1002 ¶ 93. Dr. Layton’s Declaration includes the same annotated version of Figure 7 as the Petition, which is reproduced above. *Id.* ¶ 94. Dr. Layton does not testify further regarding Figure 7 of Christensson. *See generally id.*

Patent Owner argues

Figure 7 also fails to clearly disclose the relative sizes of the two openings. Christensson’s specification describes Figure 7 as depicting two “aligned” openings that have similar “oblong” shapes. Petition at 29. But Figure 7 lacks any indication that the openings have different sizes. Additionally, in Figure 7, element 26h is an oblong opening, and [“][a]round the opening 26h is an

upwardly and centrally tapered surface 26h” that is curved towards the opening. It is unclear whether the line highlighted as blue reflects depth of element 26h’ or is meant only to illustrate the presence of the element. The Petition fails to discuss this issue. For example, Christensson indicates that Figure 7 “is a bottom view of the invention.” Ex. 1008 at 3:5. It is at least as likely that element 26h reflects the depth of the opening and not a smaller size relative to element 30h

Prelim. Resp. 59.

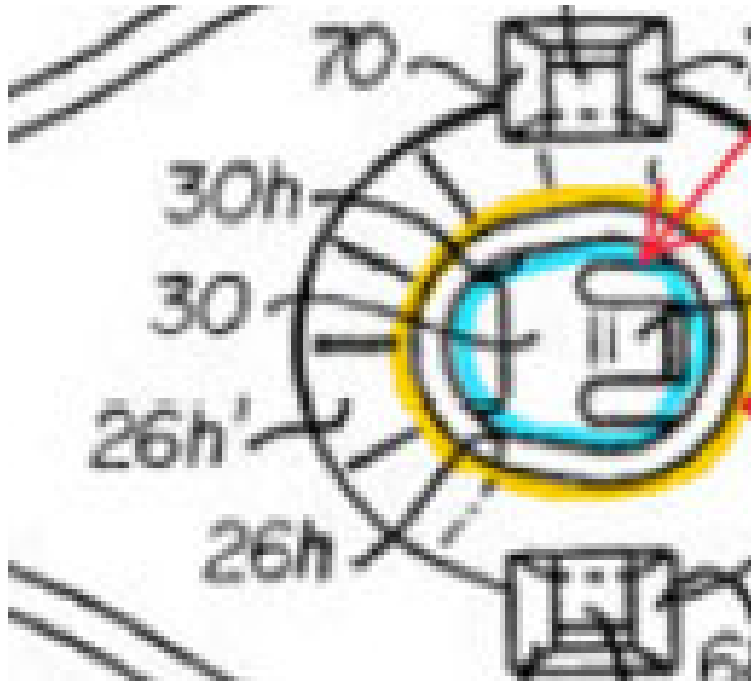
Dr. Stone testifies that Figure 7 does not “clearly demonstrate the relative sizes of the openings.” Ex. 2001 ¶ 154. Dr. Stone testifies “[w]hile Christensson discloses that a housing opening and an electrical contact opening are ‘aligned,’ this does not necessarily disclose that the openings are ‘concentric.’” *Id.* ¶ 153. Dr. Stone also testifies “Figure 7 is a bottom view of the Christensson connector, and Christensson could be illustrating relative depth of the openings in the housing and electrical contact member.” *Id.*

¶ 154. Dr. Stone further testifies as follows:

A POSITA would not necessarily interpret the drawings [Figures 3 and 7 of Christensson] as clearly illustrating the opening in the electrical contact being any larger or smaller than the opening in the housing. In my opinion, a POSITA reading Christensson would not necessarily interpret openings 26h and 30h to have different sizes than one another – only that they are “similarly shaped” and are both present in the connector.

Id.

Below is an enlarged portion of Petitioner’s annotated Figure 7 to ease viewing of the reference indicators 26h and 30h.



The partial view of Figure 7 of Christensson, above, is an enlarged portion of Petitioner's annotated Figure 7 showing the reference indicators 30h and 26h, the yellow highlighted circle, a portion of the blue highlighted circle, and parts of other adjacent elements of clasp 20. Ex. 1008, 3:6, 6:34–36, Fig. 7; Pet. 30.

As can be seen from the enlarged partial view of Petitioner's annotated Figure 7 of Christensson above, solid lines are drawn from both reference indicator 26h and reference indicator 30h to the inner circle shown in Figure 7 and highlighted in blue. Pet. 30; Ex. 1008, Fig. 7. The line extending from reference indicator 30h stops at the inner circle. The solid line extending from reference indicator 26h also stops at the inner circle, but a dotted line continues back toward reference indicator 26h.

Dr. Layton's testimony that "Christensson teaches an ECG connector assembly (clasp 20) having a second opening 30h smaller than and disposed at least partially within the first opening 26h (as shown in Figs. 3 and 7)" (Ex. 1002 ¶ 93) is conclusory. The inclusion in Dr. Layton's Declaration of

the same annotated version of Figure 7 as the Petition, without further testimony (*id.* ¶ 94) does not disclose facts or data that Dr. Layton relies on in forming his opinion that the yellow highlighted circle illustrates opening 26h and the blue highlighted circle illustrates opening 30h.

Dr. Stone’s testimony that “Figure 7 is a bottom view of the Christensson connector, and Christensson could be illustrating relative depth of the openings in the housing and electrical contact member” (Ex. 2001 ¶ 154) is consistent with the illustration of Figure 7 and the related text. Ex. 1008, 3:5, Fig. 7. Also, Dr. Stone’s testimony that a person having ordinary skill in the art would not have understood Figure 7 of Christensson “as clearly illustrating the opening in the electrical contact being any larger or smaller than the opening in the housing” (Ex. 2001 ¶ 154) also is consistent with the illustration of Figure 7 and the related text. Ex. 1008, 6:34–39, Fig. 7.

We, therefore, credit and give significant weight to the testimony of Dr. Stone regarding Figure 7 (Ex. 2001 ¶¶ 153–154) over the testimony of Dr. Layton (Ex. 1002 ¶¶ 93–94) because we find that Dr. Stone’s testimony is consistent with Christensson’s disclosures and we find that Dr. Layton’s testimony (Ex. 1002 ¶¶ 93–94) is conclusory. As a result, we find Figure 7 of Christensson does not describe element 1.3, i.e., “having a second opening smaller than and disposed at least partially within the first opening.”

Petitioner does not rely on Fukuda or Sessions for teaching element 1.3. We, therefore, conclude that Petitioner’s showing with respect to element 1.3 is deficient.

For the reasons given, we determine that Petitioner has not shown sufficiently that the combination of Fukuda, Christensson, and Sessions teaches all recitations in independent claim 1. Accordingly, we conclude that

Petitioner has not demonstrated a reasonable likelihood that it would prevail in showing that claim 1 is unpatentable under 35 U.S.C. § 103(a) as obvious over the combination of Fukuda, Christensson, and Sessions.

b) Rationale to Combine

We further consider Petitioner’s rationale to combine (Pet. 62–65) as a separate, independent reason for our conclusions herein. Petitioner argues “Fukuda teaches an open end pinch type ECG connector having all of the limitations of claim 1 except for the second opening of the electrical contact member, and its positioning and size relative to the first opening of the housing.” Pet. 63 (citing Ex. 1002 ¶¶ 171–172). Petitioner argues “Christensson teaches a closed end pinch type ECG connector having an electrical contact member having a second opening smaller than and disposed at least partially within a first opening of the housing.” *Id.* (citing Ex. 1008, 6:34–43). Petitioner further argues “[i]t would have been obvious for a POSITA to use the electrical contact member of Christensson or Sessions and the lever of Fukuda in order to achieve the more secure physical connection afforded by closed end pinch type ECG connectors.” *Id.* at 63–64 (citing Ex. 1002 ¶ 175); *see also id.* at 62–63 (arguing Christensson “teaches that closed end pinch type ECG connectors provide a more secure physical connection to ECG electrodes than open end pinch type connectors”) (citing Ex. 1008, 1:50–59; Ex. 1002 ¶¶ 173–175).

Dr. Layton testifies as follows:

Christensson, discloses that the use of open end pinch clips, as taught by Fukuda “has certain disadvantages and, in particular, cannot provide desired electrical contact and stability with a snap style contact stud.” (Christensson, Ex. 1008, Col. 1:50–52.) In order to address that problem, Christensson teaches a closed end pinch type ECG connector having an electrical contact member with an oblong opening within the opening of

the bottom wall of the housing that includes a larger first portion that allows the bulbous head of the stud through and a smaller second portion that locks the stud in place relative to the connector and prevent[s] it from being withdrawn. (*Id.* at Col 6:34–65.)

Ex. 1002 ¶ 173. Dr. Layton further testifies “[t]herefore, it would have been obvious for a POSITA to place the electrical contact member of a closed end pinch electrode connector such as those taught in Christensson and Sessions into the electrode connector of Fukuda to provide a more secure connection with the electrode press stud.” *Id.* ¶ 175.

Dr. Layton’s testimony regarding “the opening of the bottom wall of the housing that includes a larger first portion that allows the bulbous head of the stud through and a smaller second portion that locks the stud in place relative to the connector and prevent[s] it from being withdrawn” (Ex. 1002 ¶ 173) pertains to Christensson’s opening 26h (*see* Ex. 1008, 6:34–65), which Petitioner relies on for the first opening. Pet. 29. As we discuss above (*see* § III.D.4.a), Petitioner relies on the entirety of opening 26h as meeting the “first opening” limitation, not just the slightly larger front end of opening 26h. *See, e.g.*, Pet. 29. Furthermore, the forward end is a portion of opening 26h and does not satisfy Petitioner’s construction of “first opening,” which is “the aperture, or hole extending through the bottom wall of the housing from the bottom surface of the housing to the inner surface of the bottom wall that is sized to allow a press stud to extend therethrough.” Pet. 15 (citing Ex. 1002 ¶ 49). Thus, Dr. Layton’s testimony regarding “the opening of the bottom wall of the housing that includes a larger first portion that allows the bulbous head of the stud through and a smaller second portion that locks the stud in place relative to the connector and prevent[s] it from

being withdrawn” (Ex. 1002 ¶ 173) pertains to only the shape of opening 26h and does not provide a reason to modify Fukuda to include opening 30h.

Dr. Layton also testifies that Christensson teaches “an oblong opening within the opening [26h] of the bottom wall of the housing.” Ex. 1002 ¶ 173. As we discuss above (*see* § III.D.4.a), we do not find that Christensson teaches an oblong opening *within* opening 26h. Instead, Christensson teaches “opening 30h in the lower arm 24 of the spring 30,” relied on by Petitioner for teaching the “second opening” recited in element 1.3, is “[a]ligned above” opening 26h. Ex. 1008, 6:34–39 (emphasis added).

As to whether Petitioner has set forth sufficient rationale to combine, we consider whether a person having ordinary skill in the art would have had “an apparent reason to combine the known elements *in the fashion claimed by the patent at issue.*” *KSR*, 550 U.S. at 418 (emphasis added). Element 1.3 recites “having a second opening smaller than and disposed at least partially within the first opening.” Dr. Layton’s Declaration testimony regarding combining the teachings of Fukuda and Christensson to provide a more secure physical connection to ECG electrodes (*see, e.g.*, Ex. 1002 ¶¶ 173–175) does not include any reason to modify Fukuda to have “a second opening *smaller than and disposed at least partially within the first opening*” as required by element 1.3. Similarly, the Petition also does not include any reason to make the needed modification to meet element 1.3.

For the reasons given, we determine that Petitioner has not shown sufficiently a rationale to combine Fukuda, Christensson, and Sessions in the manner recited in independent claim 1. For this additional, independent reason, we conclude that Petitioner has not demonstrated a reasonable likelihood that it would prevail in showing that claim 1 is unpatentable under

35 U.S.C. § 103(a) as obvious over the combination of Fukuda, Christensson, and Sessions.

c) Conclusion

After consideration of the arguments and the evidence, we determine that Petitioner has not shown sufficiently that the combination of Fukuda, Christensson, and Sessions teaches all recitations in claim 1. Also, as an independent reason for our conclusions herein, we are not persuaded that Petitioner has offered articulated reasoning with a rational underpinning as to why one of ordinary skill in the art would have combined the teachings of Fukuda, Christensson, and Sessions in the manner recited in claim 1.

For both of these independent reasons, we conclude that Petitioner has not demonstrated a reasonable likelihood that it would prevail in showing that claim 1 is unpatentable under 35 U.S.C. § 103(a) as obvious over Fukuda, Christensson, and Sessions.

5. Independent Claim 13

Independent claim 13 recites “an electrical contact member defining a contact plane and having a contact opening that is at least partially exposed within the aperture,” which Petitioner refers to as element 13.3. Pet. 55. Petitioner argues the “term ‘a[t] least partially exposed within the aperture’ is construed to mean that the opening in the electrical contact member is *positioned at least partially inside of the aperture, between the inner and bottom surfaces of the bottom wall of the housing.*” *Id.* at 21–22 (emphasis added). For the reasons given with respect to claim construction (*see* Section III.C), we use Petitioner’s construction.

For element 13.3, Petitioner relies on many of the same disclosures discussed with respect to element 1.3 recited in claim 1. *Compare* Pet. 55–56

(citing Ex. 1008, 6:34–39, Figs. 3, 7, 12; Ex. 1002 ¶¶ 144–147), *with id.* at 29–30 (citing Ex. 1008, 6:34–39, Figs. 3, 7; Ex. 1002 ¶¶ 93–94). Element 1.3 recites “a second opening smaller than and *disposed at least partially within the first opening*” (emphasis added). The emphasized language in element 1.3 is similar to that recited in element 13.3, using Petitioner’s construction. Thus, our analysis regarding Petitioner’s arguments and evidence regarding element 1.3 also applies to element 13.3.

The only additional prior art disclosure Petitioner relies on for element 13.3 is Figure 12 of Christensson without annotations, which is reproduced below.

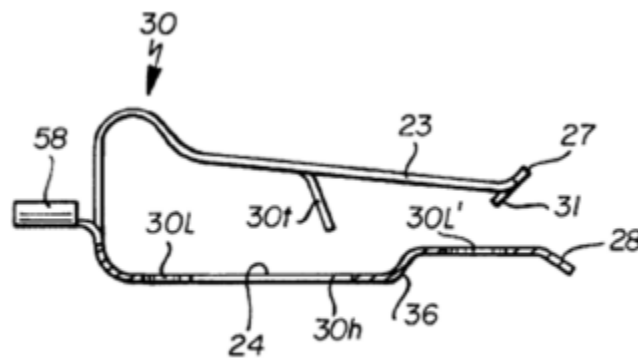


Fig. 12

Figure 12 of Christensson, above, illustrates a vertical cross section of a spring 30. Ex. 1008, 3:16–17.

Figure 12 includes the reference “30h,” but does not include a reference “26h.” Ex. 1008, Fig. 12. Dr. Layton’s Declaration includes the same reproduction of Figure 12 without annotations as set forth above. Ex. 1002 ¶ 146. Dr. Layton’s Declaration, however, does not include testimony referring to Figure 12 of Christensson. Petitioner’s reliance on Figure 12 does not remedy the deficiencies discussed with respect to claim 1.

Instead, Dr. Layton's Declaration includes a quotation of column 6, lines 34 through 39 of Christensson, discussed above with respect to claim 1. Ex. 1002 ¶ 145. Dr. Layton's Declaration also includes annotated versions of Figures 3 and 7 of Christensson and testimony that simply states where, in Dr. Layton's opinion, the first and second openings are located in Figure 3. *Id.* ¶ 146. Paragraphs 145 and 146 of Dr. Layton's Declaration do not resolve the deficiencies discussed with respect to claim 1.

Dr. Layton's Declaration also includes testimony as follows: "[i]n my opinion, the contact opening 30h in the electrical contact member or spring 30 of Christensson is within the aperture or opening 26h in the housing." Ex. 1002 ¶ 147. Dr. Layton further testifies "[a]s shown in Fig. 7, the opening 30h is clearly shown or exposed." *Id.* Dr. Layton's testimony (*id.*) is conclusory and does not remedy the deficiencies discussed with respect to claim 1. To the extent Dr. Layton is relying on a construction that "exposed" means "shown," Petitioner has not set forth unpatentability arguments based on that alternate claim construction with sufficient clarity. We use Petitioner's proposed claim construction that the "term 'a[t] least partially exposed within the aperture' is construed to mean that the opening in the electrical contact member is positioned at least partially inside of the aperture, between the inner and bottom surfaces of the bottom wall of the housing." Pet. 21–22 (citing Ex. 1002 ¶ 64). Petitioner has not made a sufficient showing that Christensson teaches element 13.3 using its proposed construction.

For its rationale to combine, Petitioner argues the "combination of Fukuda, Sessions and Christensson as applied to claim 1 also renders obvious claims 2, 4–8, 10–11, 13–14 and 16–17 of the '004 patent, and the motivation of achieving the more secure physical connection afforded by

closed end pinch ECG connectors also applies to the combination of Fukuda, Sessions and Christensson relative to these claims.” Pet. 64 (citing Ex. 1002 ¶¶ 179–185). Petitioner does not supplement its arguments or evidence for claim 13 so as to resolve the deficiencies discussed with respect to claim 1. *Id.* Petitioner’s showing is not sufficient for the same reasons given for claim 15. *See supra* § III.D.4.b.

For the reasons given for claim 1 and the reasons given above, we determine that Petitioner has not shown sufficiently that the combination of Fukuda, Christensson, and Sessions teaches all recitations in independent claim 13. Also, as an independent reason for our conclusions herein, we are not persuaded that Petitioner has offered articulated reasoning with a rational underpinning as to why one of ordinary skill in the art would have combined the teachings of Fukuda, Christensson, and Sessions in the manner recited in claim 13. Accordingly, we conclude that Petitioner has not demonstrated a reasonable likelihood that it would prevail in showing that claim 13 is unpatentable under 35 U.S.C. § 103(a) as obvious over the combination of Fukuda, Christensson, and Sessions.

6. *Dependent Claims 2, 4–8, 10, 11, 14, 16, and 17*

Claims 2–8, 10, and 11 depend directly from claim 1 and claims 14, 16 and 17 depend directly from claim 13. Petitioner’s arguments and evidence for dependent claims 2, 4–8, 10, 11, 14, 16, and 17 do not remedy the deficiencies discussed with respect to claims 1 and 13. *See* Pet. 42–54, 61–62.

Accordingly, we conclude that Petitioner has not demonstrated a reasonable likelihood that it would prevail in showing that claims 2, 4–8, 10, 11, 14, 16, and 17 are unpatentable under 35 U.S.C. § 103(a) as obvious over Fukuda, Christensson, and Sessions.

E. Unpatentability of Claim 9 under 35 U.S.C. § 103(a) over Fukuda, Christensson, Sessions, and Powell

Petitioner asserts that dependent claim 9 is unpatentable as obvious over the combination of Fukuda, Christensson, Sessions, and Powell. Pet. 4. Patent Owner does not present arguments separately contesting Petitioner's assertions for claim 9. *See generally* Prelim. Resp.

We begin with an overview of Powell. We then turn to Petitioner's contentions.

1. Powell

Powell "relates generally to the field of electrical connectors and connection apparatus, and particularly to an electrical connector apparatus useful in, inter alia, biomedical applications." Ex. 1009, 1:7–10.

Figure 1a of Powell illustrates a connector apparatus. *Id.* at 7:13–15.

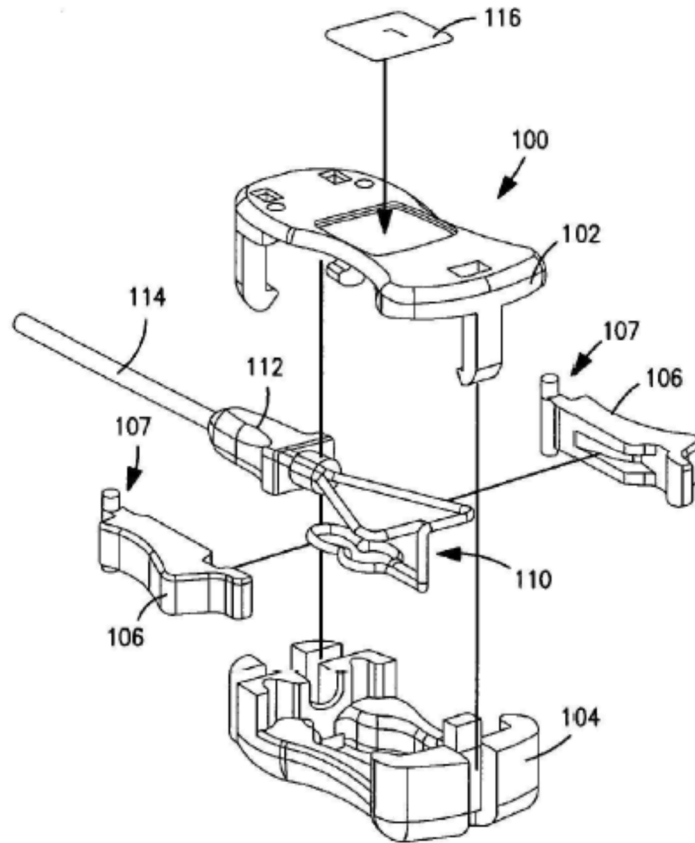


FIG. 1a

Figure 1a, above, illustrates an exploded view of connector apparatus 100 that includes housing elements 102, 104. *Id.* at 9:7–14.

Powell describes connector apparatus 100 that includes housing elements 102, 104 and two opposed actuator elements 106 that pivot about one end 107 to allow an opposing end to move with respect to housing elements 102, 104. Ex. 1009, 9:14–18. Powell explains that “[e]ach of these components comprise a molded polymer such as ABS (acrylonitrile butadine styrene), although other materials such as polyethylene, fluoropolymers (e.g., ETFE), and the like may be used.” *Id.* at 9:18–22.

2. *Dependent Claim 9*

Claim 9 depends directly from claim 1. Petitioner’s arguments and evidence for dependent claim 9 do not remedy the deficiencies discussed

with respect to claim 1. *See* Pet. 66–69. For instance, Petitioner relies on Powell for teaching “that the housing (housing elements 102, 104) and the lever (opposed actuator elements 106) are constructed from an electrical non-conductive material.” *Id.* at 66. The material used to construct the housing elements does not remedy deficiencies associated with the position and size of the second opening relative to the first opening discussed with respect to independent claim 1.

Accordingly, we conclude that Petitioner has not demonstrated a reasonable likelihood that it would prevail in showing that claim 9 is unpatentable under 35 U.S.C. § 103(a) as obvious over Fukuda, Christensson, Sessions, and Powell.

F. Naming All Real Parties-in-Interest

Patent Owner argues that “3M is a real party in interest.” Prelim. Resp. 62. Patent Owner argues that “the Petition should be denied” or “[i]n the alternative, at a minimum 3M should be added as a real party in interest to this Petition in the interest of judicial economy.” *Id.* We need not address Patent Owner’s contentions concerning Petitioner’s named real parties-in-interest because we deny the Petition on the basis that Petitioner has not established a reasonable likelihood of prevailing in demonstrating the unpatentability of any challenged claim of the ’004 patent.

G. Word Limit

Patent Owner argues the “Petition exceeds the Board’s word limit.” Prelim. Resp. 70. We need not address Patent Owner’s argument that the Petition exceeds the word limit because even upon consideration of all Petitioner’s arguments presented in the Petition and all evidence relied on by Petitioner, Petitioner has not established a reasonable likelihood of

prevailing in demonstrating the unpatentability of any challenged claim of the '004 patent.

IV. CONCLUSION

We have reviewed the parties' arguments and have considered all of the evidence presented by Petitioner and Patent Owner. For the foregoing reasons, we conclude that the information presented in the Petition does not establish a reasonable likelihood that Petitioner would prevail in showing that any of claims 1, 2, 4–11, 13, 14, 16, and 17 of the '004 patent is unpatentable.

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that the Petition is *denied*, and no trial is instituted.

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Patent 8,795,004 B2

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