

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

IRHYTHM, INC.,

Petitioner,

v.

WELCH ALLYN, INC.,

Patent Owner.

CASE: IPR2025-00374

U.S. PATENT NO. 8,965,492

PATENT OWNER PRELIMINARY RESPONSE

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TABLE OF PATENT OWNER EXHIBITS

Exhibit No.	Description
2001	Information Disclosure Statement dated May 18, 2015 in Application No. 13/890,144, submitted by Petitioner indicating it was aware of the '007 Patent, reference no. 67
2002	Information Disclosure Statement dated August 7, 2013 in Application No. 13/890,144, submitted by Petitioner indicating it was aware of the pre-grant publication that issued as the '007 Patent, reference no. 101
2003	iRhythm's Amended Answer alleging infringement against PO's related company, Bardy Diagnostics
2004	26(f) Report from <i>Bardy Diagnostics, Inc. v. iRhythm Technologies, Inc.</i> , 1:24-cv-01355, indicating Petitioner iRhythm's intent to assert additional patents.
2005	Scheduling order in <i>Welch Allyn Inc. v. iRhythm Technologies, Inc.</i> , 1:24-cv-00224
2006	Notice of Service of Party Discovery in <i>Welch Allyn Inc. v. iRhythm Technologies, Inc.</i> , 1:24-cv-00224 (ECF 26)
2007	Notice of Service of Party Discovery in <i>Welch Allyn Inc. v. iRhythm Technologies, Inc.</i> , 1:24-cv-00224 (ECF 27)
2008	Notice of Service of Third-Party Discovery in <i>Welch Allyn Inc. v. iRhythm Technologies, Inc.</i> , 1:24-cv-00224 (ECF 41)
2009	Notice of Service of Third-Party Discovery Responses in <i>Welch Allyn Inc. v. iRhythm Technologies, Inc.</i> , 1:24-cv-00224 (ECF 47)
2010	Excerpt from Zenious et al., BIODESIGN; THE PROCESS OF INNOVATING MEDICAL TECHNOLOGIES
2011	Notice of Service of Third-Party Discovery in <i>Welch Allyn Inc. v. iRhythm Technologies Inc.</i> , 1:24-cv-00224 (ECF 48)

Exhibit No.	Description
2012	[Reserved]
2013	[Reserved]
2014	Declaration of Dr. Brian Anthony for IPR2025-00374 of U.S. Patent No. 8,965,492
2015	[Reserved]
2016	[Reserved]
2017	[Reserved]

Patent Owner, Welch Allyn, Inc. (“Welch Allyn” or “Patent Owner”), submits this Patent Owner Preliminary Response (“Response”) pursuant to 37 C.F.R. § 42.107(a) to the *Inter Partes* Review petition (“Petition”) filed by iRhythm, Inc. (“Petitioner”) for Claims 1-8 and 11-14 (the “Challenged Claims”) of U.S. Patent No. 8,965,492 (the “’492 Patent”) (Ex. 1003).

I. INTRODUCTION

The ’492 Patent claims a novel structure for a body-worn patient monitoring device by bifurcating the device into two main components—the communication-computation module and the disposable electrode portion—to provide “a medical-grade monitor that can intelligently measure and transmit data” while balancing disposable and non-disposable portions. Ex. 1003, 2:34-38; 4:56-64; Cls. 1, 7, Abstract; Ex. 2014, ¶[0045]. The ’492 Patent provides a flexible printed circuit layer, which is located on the disposable electrode portion, that includes resistive traces for carrying an electrical signal from the electrodes to a connection pad, and further to the processor for analysis. Ex. 1003, Cls. 1, 7, 7:44-55; Ex. 2014, ¶[0047].

Notably, the Petition does not identify a single reference that includes this bifurcated structure with the printed circuit layer and electrical traces. With the benefit of hindsight, the Petition attempts to reconstruct the novel features of the ’492 Patent. The Petition worsens this issue by advancing fundamentally flawed

grounds. To form the basis of its challenges, the Petition gap-fills the prior art by expressly relying on the “General Knowledge” of a POSA. Petition, 1-2. This approach contradicts Federal Circuit law and 35 U.S.C. § 311(b), which allows challenges “*only* on the basis of prior art consisting of patents or printing publications.” See *Qualcomm Inc. v. Apple Inc.*, Nos. 2023-1208, -1209, 2025 WL 1174161 (Fed. Cir. Apr. 23, 2025). The “General Knowledge” of a POSA—which plagues every Ground of the Petition—is neither a patent nor printed publication. The Petition should therefore be denied for failing to comply with § 311(b).

Moreover, the Petition forces combinations (where no motivation exists) and offloads its analysis to the Board. In particular, the Petition relies on the “ordinary and customary meaning” for all claim terms, even when a construction of a term is critical. Petition, 2. Without any constructions, the Board is required to speculate, and Patent Owner is left to argue against implicit constructions by the Petition. And—across all five petitions—the Petition relies on the omnibus 516-page expert declaration of Dr. Heikenfeld spanning over 1,700 paragraphs, replete with confusing nested cross-citations between patents and proceedings. Finally, the Petition relies extensively on Exhibit 1012, a purported English translation of Japanese Pat. Pub. 2004/121360 to *Matsumura*, but Petitioner failed to establish that

Exhibit 1012 is an accurate translation, leaving the Board and Patent Owner to guess the accuracy. Exs. 1065, 1066 and 1012 (all lacking any connection).

The Petition's theories of unpatentability also fail on the technical merits.

In Ground 1, the Petition relies on the combination of *Matsumura*,¹ *Kroll*,² and the "General Knowledge" of a POSA. Petition, 15-35. This challenge fails because the Petition does not establish that *Matsumura* renders obvious the flexible *printed* circuit layer. *Kroll*, when combined with *Matsumura*, does not cure this deficiency as *Kroll* concerns a different type of electrical arrangement that does not address the structural or functional characteristics required by the claim. The Petition further fails to articulate a sufficient motivation to combine *Matsumura* and *Kroll*. *Matsumura*'s structural approach is fundamentally different from the circuit configurations in *Kroll*, and the Petition does not explain why a POSA would have sought to integrate these disparate teachings. Rather than provide a reasoned basis for the proposed combination based on the teachings of *Matsumura* and *Kroll*, the

¹ Purported Translation of Japanese Pat. Pub. 2004/121360 to *Matsumura* (Ex. 1012).

² U.S. Patent No. 4,763,660 to *Kroll* et al. (Ex. 1014).

Petition relies on hindsight, using Claim 1 as a blueprint rather than demonstrating that a POSA would have independently arrived at the Challenged Claims.

In Ground 2, the Petition relies on the combination of *Jensen*,³ *Kroll*, and “General Knowledge.” Petition, 35-48. This combination fails because it does not render obvious the “at least one electrical trace” in Claim 1, which is the only independent claim challenged in Ground 2. This is but one instance where the Petition hides behind the “ordinary and customary meaning” to avoid advancing a clear position. Petition, 2. Under a proper construction, the Petition fails. Ground 2 also fails to establish a motivation to combine *Jensen* and *Kroll*. Without using Claim 1 as a roadmap, a POSA would not have been motivated to remove *Jensen*’s conventional resistors and replace them with *Kroll*’s lead strips.

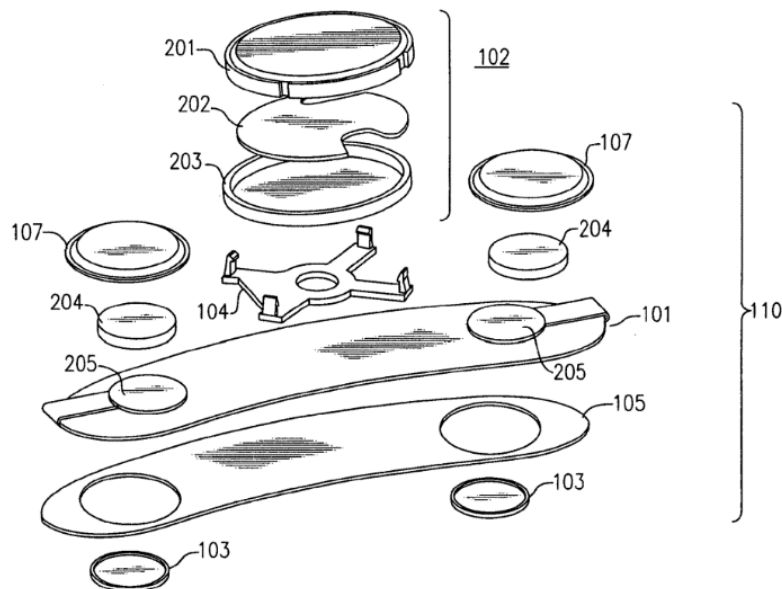
In Ground 3, the Petition relies on *Jensen*, *Matsumura*, *Kroll*, and “General Knowledge.” But Ground 3 suffers from even more issues than Ground 2. Namely, Ground 3 does not render obvious the reusable communication module, the disposable electrode portion, the electrical traces, or the releasably attached communication module of independent Claim 7. Moreover, the Petition does not

³ U.S. Patent Publication No. 2003/0149349 to *Jensen* et al. (Ex. 1011).

provide a legally sufficient motivation to combine *Jensen* and *Matsumura* or *Jensen* and *Kroll*. Accordingly, Ground 3 fails.

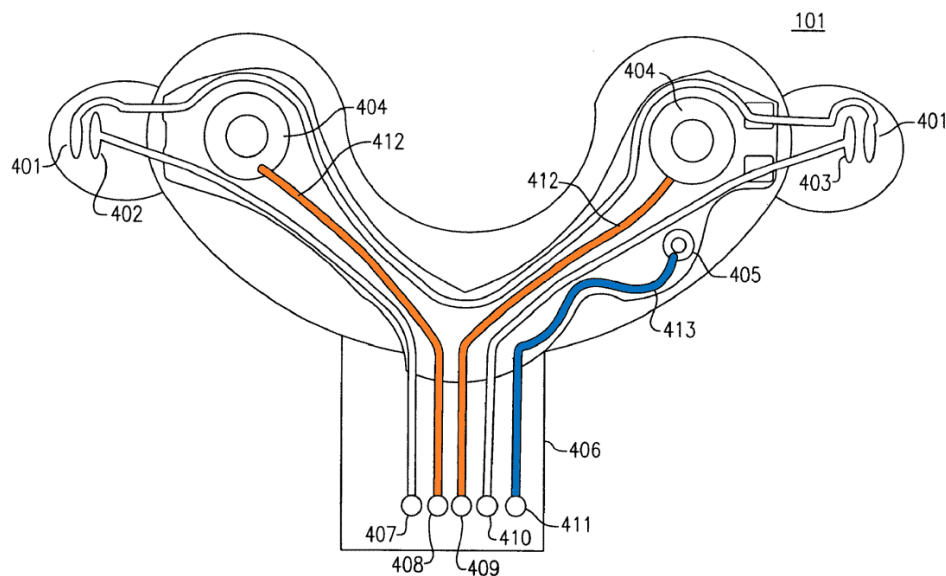
II. SUMMARY OF THE '492 PATENT

The '492 Patent provides a body-worn patient monitoring device that adhesively attaches to a patient's skin for measuring physiological signals. Ex. 1003, Abstract, Cl. 1; Ex. 2014, ¶[0045]. The body-worn patient monitoring device includes computation-communication module 102 releasably attached to disposable electrode module 110. Ex. 1003, Cl. 7, 4:56-64, Figure 2; Ex. 2014, ¶[0045]. In Figure 2, retention clip 104 secures the computation-communication module to the disposable electrode module. Ex. 1003, Cl. 7; Ex. 2014, ¶[0045].



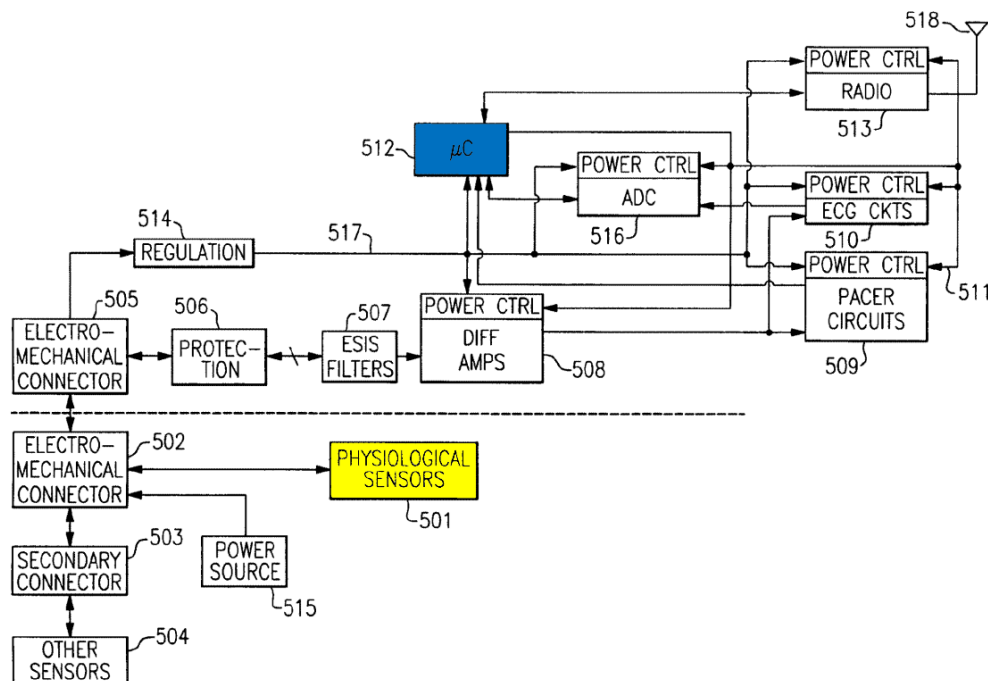
Ex. 1003, Figure 2.

The disposable electrode module includes flexible printed circuit layer 101 made from an insulating material. Ex. 1003, 5:12-25, Cl. 1; Ex. 2014, ¶[0046]. The flexible printed circuit layer transmits electrical signal via traces, which connect a connection pad and an electrode. Ex. 1003, 7:44-55, Cls. 1, 7; Ex. 2014, ¶[0046]. The traces 412 (orange), which are preferably printed, “extend[] between conductive surface 404 and connection pads 408 and 409.” Ex. 1003, Figure 4A (annotated), 5:31-37 (defining the conductive surface as part of the electrode), 7:50-55, 11:13-18; Ex. 2014, ¶[0046]. Similarly, the trace 413 (blue), “extend[s] between conductive surface 405 and connection pad 411.” Ex. 1003, Figure 4A (annotated) 7:44-55, Figure 4A (annotated); Ex. 2014, ¶[0046]. The traces are made from a resistive material. Ex. 1003, 7:50-55, Cl. 1; Ex. 2014, ¶[0046].



Ex. 1004, Figure 4A (annotated); Ex. 2014, ¶[0046].

This pathway from the electrodes to the computation-communication module is also shown in the block diagram of Figure 5. Ex. 1003, 11:29-46. There, the physiological sensors (*e.g.*, electrodes) for capturing an ECG difference potential, are indicated in yellow. Ex. 1003, 11:29-46, Figure 5 (annotated); Ex. 2014, ¶[0047]. The physiological sensors are electrically coupled to electromechanical connector 502, which connects to the processor for performing computational analysis on the detected signals. Ex. 1003, 11:33-43, Figure 5 (annotated), Figure 4A; Ex. 2014, ¶[0047]. The computation-communication module further includes a housing that contains this processor. Ex. 1003, Cl. 7; Ex. 2014, ¶[0047].



Ex. 1003, Figure 5 (annotated); Ex. 2014, ¶[0047].

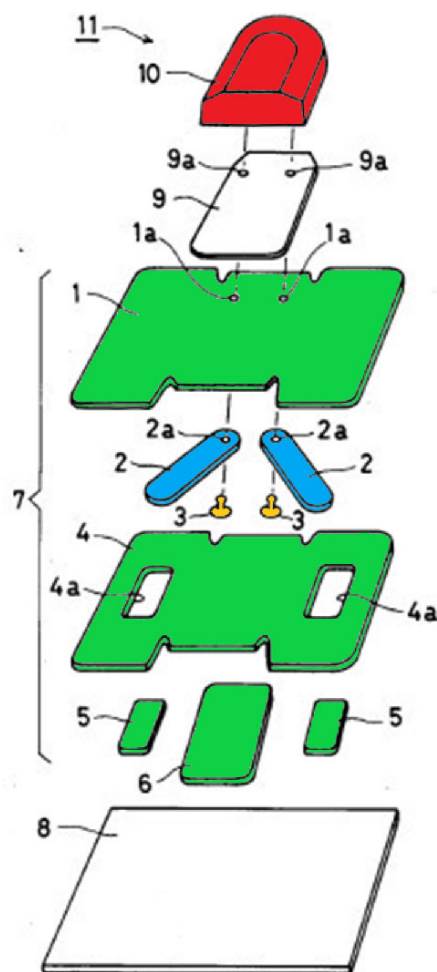
III. ORIGINAL PROSECUTION OF THE '492 PATENT

The '492 Patent issued from U.S. Patent Application No. 14/268,666 without rejection.

IV. OVERVIEW OF THE ART

A. Overview of *Matsumura*

Matsumura describes a waterproof wearable monitor for detecting bioelectric potential, addressing concerns regarding water submersion of the monitor. Ex. 1012, Abstract; Ex. 2014, ¶[0054]. In Figure 1, *Matsumura* provides a bioelectric potential detector 11 comprised of disposable pad 7 (green) and reusable signal processor 10 (red). Ex. 1012, ¶[0016]. Disposable pad 7 further comprises first sheet 1, conductive material 2 (blue), hooks 3 (orange), second sheet 4, conductive gels 5, and double-sided adhesive tape 9. Ex. 1012, ¶[0016]. Conductive material 2 creates a conductive path between conductive gel 5 and hooks 3, and hooks 3 provide a conductive path upwards through first sheet 1 and double-sided adhesive tape 9 to processor 10. Ex. 1012, ¶[0019]; Ex. 2014, ¶[0054].



Ex. 1012, Figure 1 (annotated); Ex. 2014, ¶[0054].

Matsumura explains “two pieces of conductive material 2 and two hooks 3 are arranged to transmit the bioelectric potential detected by the conductive gel 5, which is placed in the openings 4a of the second sheet 4.” Ex. 1012, ¶[0019]. Conductive material 2 is rod-shaped with one end that contacts conductive gel 5 and the other end that “has two holes 2a through which the protruding portions of hook 3 are inserted.” Ex. 1012, ¶[0019]. This configuration allows the “the bioelectric

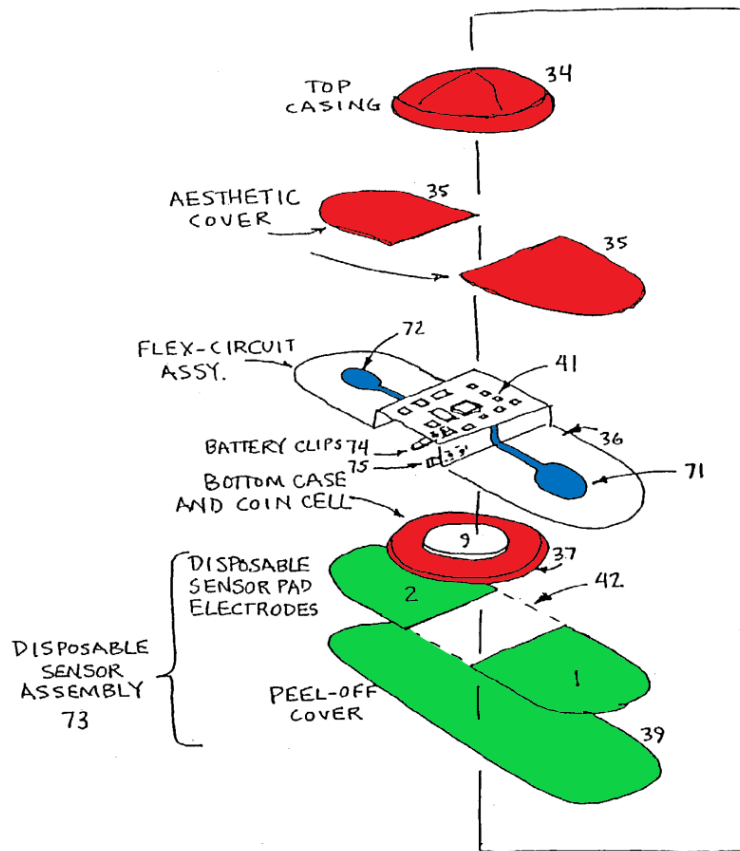
potential detected by the conductive gel 5 [to be] transmitted through the conductive material 2 and the hooks 3.” Ex. 1012, ¶[0019]; Ex. 2014, ¶[0055].

Hooks 3 play a vital electro-mechanical role in preserving the device’s electrical and structural integrity by securely, but releasably, attaching disposable pad 7 to signal processor 10, while also transmitting bioelectric potential signals received from conductive material 2 to signal processor for processing. Ex. 1012, ¶[0019]; Ex. 2014, [0056].

B. Overview of *Jensen*

Jensen provides a cardiac monitor that adheres to a patient’s skin. Ex. 1011, Abstract; Ex. 2014, ¶[0048]. *Jensen*’s “novelty include[s] its physical construction and method of use.” Ex. 1011 ¶[0030]. Regarding its size, *Jensen* discloses “a totally self-contained sensor that is thin, being less than 6 or 7 mm in thickness, [and] low in mass.” Ex. 2015, ¶[0048]; Ex. 1011 ¶[0030].

As part of the self-contained sensor, *Jensen* provides disposable sensor assembly 73, which includes cover 39, connective material 42, and pads 1 and 2. Ex. 1011, ¶[0040], Figure 5 (indicating the disposable components in green); Ex. 2014, ¶[0049]. These three components are the full extent of *Jensen*’s disposable components. Ex. 2014, ¶[0049].

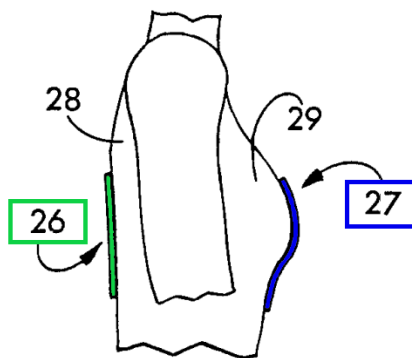


Ex. 1011, Figure 5 (annotated); Ex. 2014, ¶[0049].

In contrast, the reusable portions (red) include bottom case 37, top casing 34, and two aesthetic covers 35. Ex. 1011, ¶[0040], Figure 5 (indicating the reusable components in red); Ex. 2015, ¶[0049]. *Jensen* also describes an additional, non-disposable flexible circuit assembly 36 having “traces” (annotated in blue). Ex. 1011, ¶[0040], Figure 5; Ex. 2014, ¶[0050]. These “traces” connect electronics circuit 41 to sensor contacts 71 and 72, which in turn connect to pads 1 and 2 of disposable sensor assembly 73. Ex. 1011, ¶[0040], Figure 5; Ex. 2014, ¶[0050]. This way, the signal is transmitted to electronics circuit 41.

C. Overview of *Kroll*

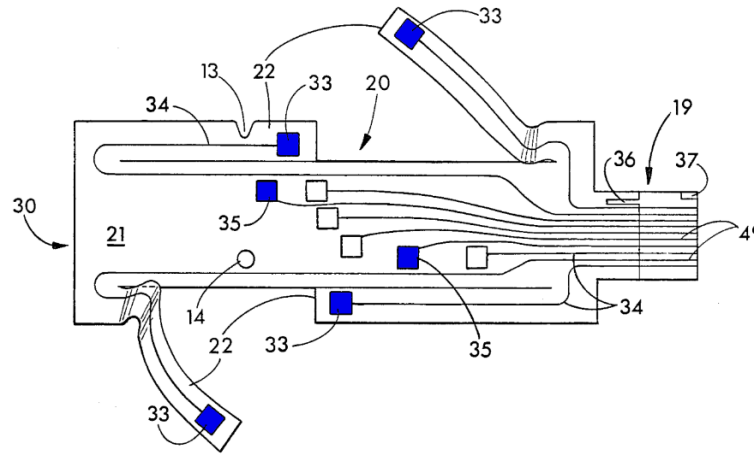
Kroll provides a disposable electrode belt, which is a therapeutic device “for receiving and transmitting electric current and voltage.” Ex. 2014, ¶[0057]; Ex. 1013, 2:41-47. To achieve its therapeutic effect, *Kroll*’s disposable electrode belt transmits current “to specific anatomical locations” of the patient. Ex. 2014, ¶[0057]; Ex. 1013, 1:27-36. *Kroll* sizes its belt to allow for the device to be placed on the patient’s chest and back concurrently to deliver an electrical current through the chest of the patient. Ex. 2014, ¶[0058]; Ex. 1013, 4:44-47, Figure 3 (indicating the chest portion of the belt in blue and the back portion of the belt in green).



Ex. 1013, Figure 3 (annotated); Ex. 2014, ¶[0058].

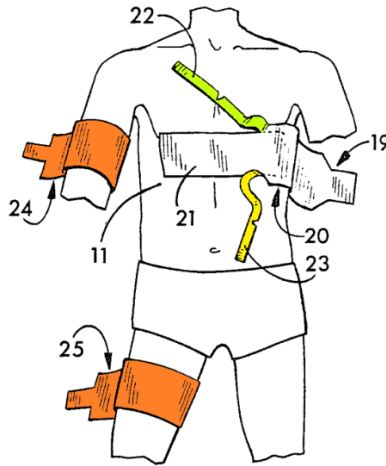
Figure 4 shows the electrodes (indicated in blue) of *Kroll*’s disposable electrode belt. Ex. 2014, ¶[0059]; Ex. 1013, 4:48-68, Figure 4A (annotated). Each electrode “transmit[s] and receive[s] electric signals” over lead strip 34. Ex. 2014, ¶[0059]; Ex. 1013, 5:1-4. “[T]o **protect a patient** from shock due to malfunction of the device 20 or of a complementary medical device,” the lead strips may provide a

“certain total lead strip resistance,” thereby serving as a current limiter. Ex. 2014, ¶[0059]; Ex. 1013, 5:4-13.



Ex. 1013, Figure 4A (annotated); Ex. 2014, ¶[0059].

The disposable electrode belt also includes extendable side members 22 that extend from the electrode belt's main body for placement outside of the precordial region. Ex. 2014, ¶[0060]; Ex. 1013, 4:37-47, Figure 4A, Figure 2 (indicating the side members in yellow). *Kroll's* electrode belt may also be placed around the patient's limbs. Ex. 2014, ¶[0060]; Ex. 1013, 4:37-47, Figure 2 (indicating the embodiments placed around the limbs in orange). Each embodiment is a specific size and structure to provide a desired therapeutic effect to a specific portion of the human body. Ex. 2014, ¶[0060].



Ex. 1013, Figure 3 (annotated); Ex. 2014, ¶[0060].

V. “GENERAL KNOWLEDGE” AND CLAIM CONSTRUCTION⁴

A. The Petition Fails to Comply with 35 U.S.C. § 311(b)

The Petition does not satisfy 35 U.S.C. § 311(b) because the Petition relies on the “General Knowledge” of a POSA as a basis in all Grounds. Petition, 1-2; 35 U.S.C. § 311(b) (permitting challenges “only on the basis of prior art consisting of patents or printing publications”). Petitioner’s strategy, summarized in its proposed grounds of unpatentability, is improper.

⁴ This Response includes similar arguments as in Patent Owner’s Argument for Discretionary Denial to show how Petitioner’s failure to construe key terms impacts the technical merits of the Petition. Paper 7 at 12-18.

This conclusion, which is supported by Federal Circuit law, is established by two principles. First, § 311(b) only permits challenges on the “basis of prior art consisting of patents or printing publications.” 35 U.S.C. § 311(b). Second, the Petition expressly relies on “General Knowledge” as a basis for its challenges in Grounds 1 to 3. Petition, 1-2. Specifically, the Petition opens with a table, prominently labeled: “Proposed Grounds of Unpatentability.” Petition, 1-2. In one example, Ground 1, which applies equally to Grounds 2 and 3, relies on “Matsumura, Kroll, and *General Knowledge of a [POSA]*.” Petition, 1. The Petition repeats this combination and listing of “General Knowledge.” Petition, 2-3, 15.

Where petitioner provides a table outlining its challenge to the challenged claims that lists non-patents and non-printed publications, the Petition fails. *Qualcomm Inc. v. Apple Inc.*, Nos. 2023-1208, -1209, 2025 WL 1174161 (Fed. Cir. Apr. 23, 2025). The court held that a listing of AAPA in the table was an “express statement[]” that AAPA is part of the basis of its ground. *Id.* at *9.

Ground	'674 Patent Claims	Basis for Rejection
Ground 1	1, 2, 5-7	§103: Steinacker in view of Doyle and Park
Ground 2a	1, 2, 5, and 6,	§103: <u>Applicants Admitted Prior Art (AAPA)</u> in view of Majcherczak
Ground 2b	7	§103: <u>AAPA in view of Majcherczak and Matthews</u>

Id. at *4.

Here, the Petition’s listing of “General Knowledge” is likewise an express statement that “General Knowledge” is part of the basis of Grounds 1 to 3.

Proposed Grounds of Unpatentability	
<u>Ground 1</u>	Claims 1-3, 5-8, and 11-14 are obvious under pre-AIA § 103 over Matsumura, Kroll, and <u>General Knowledge of a Person of Ordinary Skill in the Art</u>
<u>Ground 2</u>	Claims 1-6 are obvious under pre-AIA § 103 over Jensen, Kroll, and <u>General Knowledge of a Person of Ordinary Skill in the Art</u>
<u>Ground 3</u>	Claims 7, 8, and 11-14 are obvious under pre-AIA § 103 over Jensen, Matsumura, Kroll, and <u>General Knowledge of a Person of Ordinary Skill in the Art</u>

Petition, 1-2 (annotated).

In *Qualcomm*, the Federal Circuit ultimately held that the petition failed to comply with § 311(b) by including AAPA as part of its **basis** for its challenge. *Id.* at *11. The same conclusion should follow here. Like the petitioner in *Qualcomm*, the Petitioner chose not to limit its challenges to “patents or printing publications.” 35 U.S.C. § 311(b). Instead, the Petition relies on “General Knowledge” to teach elements missing from the references themselves.

Thus, in view of Federal Circuit law and a plain reading of § 311(b), the Petition cannot advance “General Knowledge” as the basis for its challenges.

B. The Petition Fails to Advance a Legally Cognizable Claim Construction Position

When construing claims, the Board applies the principles set forth in *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312-17 (Fed. Cir. 2005) (en banc). Although Petitioner claims to apply the ordinary and customary meaning of the terms (Petition, 2), the Petition is instead filled with implicit claim constructions that lack support or explanation. *ams AG v. 511 Innovations, Inc.*, IPR2016–01792, Paper 15 at 8, 13 (P.T.A.B. Mar. 16, 2017). This failure leaves the Board without a clear and reasoned basis to evaluate claim scope, thereby shifting the burden of claim clarification to the Patent Owner and the Board. The Petition’s flaws are exacerbated by its extensive reliance on non-prior art references, as well as significantly outdated and non-relevant references.⁵

i. The Petition is Riddled with Claim Construction Yet Fails to Propose Actual Constructions

Petitioner has an affirmative burden to set forth how the challenged claims should be construed. *See, e.g., Orthopediatrics Corp. v. K2M, Inc.*, IPR2018-01548, Paper 9 at 10 (P.T.A.B. Mar. 1, 2019). A petition for *inter partes* review must clearly

⁵ The Petition’s reliance on non-prior art documents is also covered in Patent Owner’s Argument for Discretionary Denial. *See* Paper 7 at 24-26.

articulate a rationale for “[h]ow the challenged claim is to be construed.” 37 CFR § 42.104(b)(3). If the petitioner construes a claim term, but “does not establish that such interpretations are appropriate[,]” it is fatal to the petitioner’s ground. *Vicor Corp. v. Delta Elecs., Inc.*, IPR2024-00704, Paper 11 at 8 (P.T.A.B. Oct. 2, 2024). To determine the meaning of a disputed claim term, one must “look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the prosecution history, if in evidence.” *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 469 F.3d 1005, 1014 (Fed. Cir. 2006).

The Petition’s singular reference to claim construction states, “Claims are interpreted with their ordinary and customary meaning as understood from the perspective of a [POSA].” Petition, 2. Despite this, the Petition repeatedly engages in improper claim construction, deviating significantly from the “ordinary and customary meaning” of the construed terms without providing any rationale for doing so, often treating an amalgamation of non-contemporaneous, unhelpful, irrelevant documents as if they were helpful to the *Phillips* inquiry.

For example, as discussed in Section VII.B.i.b., the Petition improperly interprets “extending between” to include anything that is electrically coupled and pays no heed to the claim’s requirement that the trace must extend directly between a connection pad and a conductive surface. *Infra* Section VII.B.i.b.

In support of this dubious interpretation, the Petition cites no supporting evidence, and Dr. Heikenfeld substantially parrots the Petition, which is not persuasive or helpful as it repeats the Petitioner's arguments and offers little or no elaboration as to how one of ordinary skill in the art would understand the term. One exception is Dr. Heikenfeld's allegation that "a POSA would understand that, for signals from sensor contacts 71, 72 to reach the electrical circuits located on substrate 49, traces **must** extend between the connection pad and a conductive surface of at least one electrode." Ex. 1009, ¶898 (emphasis in original).

Another example of the Petition's improper claim construction involves the Petition's improper interpretation of the claim term "defined between." As discussed further below, the Petition repeats the same fatal flaws when it construes the claim term "defined between" as it does with "extending between," including failing to apply the *Phillips* framework, and failing to provide any plausible support or factual bases for its broad and erroneous interpretations. *Infra* Section VII.C.i.c.

ii. Petitioner Improperly Shifts the Burden of Claim Clarification to the Board and Patent Owner

As a result of the Petition's improper and unclear claim constructions, Petitioner improperly shifts the burden of claim clarification to the Patent Owner and the Board. As discussed, the Petition fails to adequately articulate a construction of the claim terms "extending between" and "defined between," despite applying an

impermissibly broad interpretation of the claim language throughout the Petition. *Supra* Section VI.A.i.; *see also infra* Sections VII.B.i.b., VII.C.i.c. Where Petitioner sets forth arguments or observations of what a claim term means but does not provide an explicit construction for the claim term, the “Petitioner improperly attempts to shift the burden of construing the claim term...to the Board[,]” and institution should be denied. *See ams AG*, No. IPR2016–01792.

iii. The Petition’s Reliance on Non-Prior Art, Outdated, and Irrelevant References Significantly Burdens the Patent Owner and the Board

The Petition’s reliance on non-prior art, outdated, and irrelevant references is an aggravating factor that undermines its obviousness theories. Specifically, the Petition claims to establish the “state of the art” using 55 references. However, many of these references are not actually prior art, and the Petition fails to distinguish which references qualify as valid art for the state-of-the-art determination.

As described above, of the 66 exhibits submitted with the Petition, the Petitioner relies on 55 references (Exs. 1011 through 1065) as supporting its unpatentability theories. Of these 55 references, eight are decidedly not prior art, being from *after* the November 2006 priority date of the ’492 Patent. For example, Exhibits 1020 (dated in 2008); 1021 (dated in 2013); 1024 (dated in 2023); 1025 (dated in 2012); 1027 (dated in 2025), 1030 (dated in 2022), 1043 (dated in 2019),

and 1035 (dated in 2006), were all dated anywhere from months to *19 years after* the priority date of the '492 Patent (November 1, 2006). Dr. Heikenfeld's reliance on these non-prior art documents is extensive: He cites Ex. 1035 approximately 62 times in his declaration and Exhibit 1043 approximately ten times in his declaration, not including any internal cross references that incorporate these references. He further relies on Exhibits 1020, 1021, 1024, 1025, 1027, and 1030 in his "background sections" which are cross-referenced repeatedly throughout his declaration including his actual analysis of claim elements and explanations for why the alleged combinations would be made.

That the Petition relies on references from after the priority date of the '492 Patent as alleged evidence of the "state of the art" at the time of the invention—2006—creates confusion, undermines the foundation of the obviousness challenge, and distorts the obviousness inquiry making it difficult for both the Patent Owner and the Board to decipher the proper state of the art at the time of the claimed invention.

Moreover, many of the other cited references are significantly outdated, lack contextual explanations, and are presented without sufficient clarity as to their relevance to the technology at issue. For example, the Petition does not explain why these very old references (some 50+ years prior to the priority of the '492 Patent) are still relevant to the claimed invention or provide any insight into how they would

contribute to a POSA's understanding of the technology at the time of the claimed invention.

In light of the Petition's failure to establish the relevancy of these references, one can only assume they are irrelevant, unreliable, and inapplicable to the field of the invention as of 2006. There is no rational basis for relying on the references, as they lack the modern technological relevance necessary for a POSA to reasonably combine them.

VI. THE PETITION FAILS TO SHOW THAT THERE IS A REASONABLE LIKELIHOOD THAT THE PETITIONER WILL PREVAIL ON A SINGLE CLAIM

A. Ground 1 Fails to Render Obvious the Challenged Claims

Matsumura as modified by the "general knowledge" fails to teach or suggest the flexible printed circuit layer made from an insulating material of Claim 1.

Although the Petition relies on *Matsumura* for this element, a *printed* circuit layer is completely absent from *Matsumura's* teachings. A POSA would have understood that the Petition's proposed modifications would render *Matsumura* inoperable for its intended purpose of providing a waterproof wearable monitor.

Moreover, the Petition fails to provide a legally sufficient motivation to combine *Matsumura*, *Kroll*, and general knowledge. *First*, the Petition's proposed modification of *Matsumura* in view of the "general knowledge" renders

Matsumura's device inoperable for its intended purposes. ***Second***, a POSA would not have been motivated to modify *Matsumura* in view of *Kroll* based on either a desire to reduce the size of *Matsumura's* device or to protect the patient from potential shock. Downsizing is not a sufficient motivation to combine because *Matsumura's* device has already achieved a sufficiently miniature device, and a POSA would not have been motivated to further reduce the size.

Thus, a POSA would not have been motivated to combine *Matsumura* and *Kroll* with the “general knowledge” of a POSA.

i. The Non-Obvious Combination of *Matsumura* and *Kroll* Fails to Teach or Suggest Every Element of Claim 1

First, the combination fails to render obvious a flexible printed circuit layer. To teach this element, the Petition proposed modifying *Matsumura's* non-printed conductive electronics with a sheet of insulating material and printed traces. Petition, 18-19. *Matsumura*, however, does not teach or suggest any printed circuit layer, and in fact, expressly requires non-printed electrical components. And the Petition provides no reason why a POSA “would understand” that *Matsumura's* electronics could be printed. Petition, 19; *infra* Section VI.A.ii.

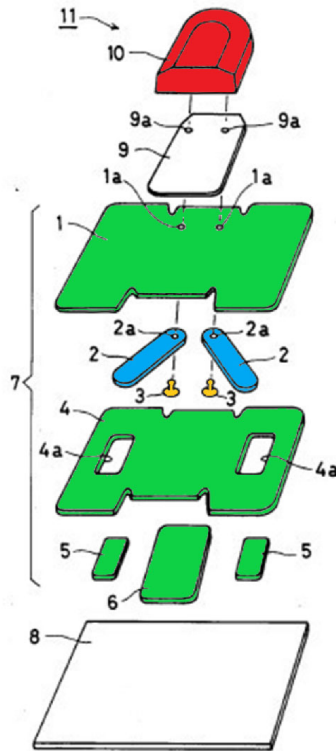
Second, because *Matsumura* does not disclose a flexible printed circuit layer, and a POSA would not have been motivated to replace *Matsumura's* non-printed electronics with printed circuitry, *Matsumura* does not render obvious the claimed

“electrical trace.” This is because *Matsumura*’s electronics (conductive material 2 and hooks 3) do not “extend[] between the at least one connection pad and a conductive surface.” Ex. 1003, Cl. 1; Ex. 2014, ¶[0071]. *Matsumura*’s disclosure supports this position and contradicts the Petition’s conclusion that a POSA “would understand” this element to be met. Ex. 2014, ¶¶[0071], [0075]; Petition, 22-23. Further, the Petition’s implicit construction of “extending between” is improper.

a. *Matsumura* does not disclose the printed circuit layer

The Petition fails to establish that *Matsumura* teaches or suggests a flexible ***printed*** circuit layer. Ex. 2014, ¶¶[0066]-[0067], ¶[0070]. Rather, *Matsumura* discloses a “bioelectric pad” composed of (1) a first sheet, (2) a conductive material, (3) a hook, (4) a second sheet, (5) a conductive gel, (6) a third sheet, and (7) double-sided adhesive tape. Ex. 1012, ¶[0016]. None of these components are a printed circuit layer, and the Petition does not contend such. Petition, 18-19.

Matsumura discloses that its conductive material is rod-shaped and that the hooks (yellow) are studs that protrude through the back side of the conductive material (blue). Ex. 1012, ¶[0019]; Figure 1. A POSA would have understood that neither the conductive rods nor the protruding hooks are ***printed***, and thus *Matsumura* does not disclose a printed circuit layer. Ex. 2014, ¶¶[0071]-[0074].



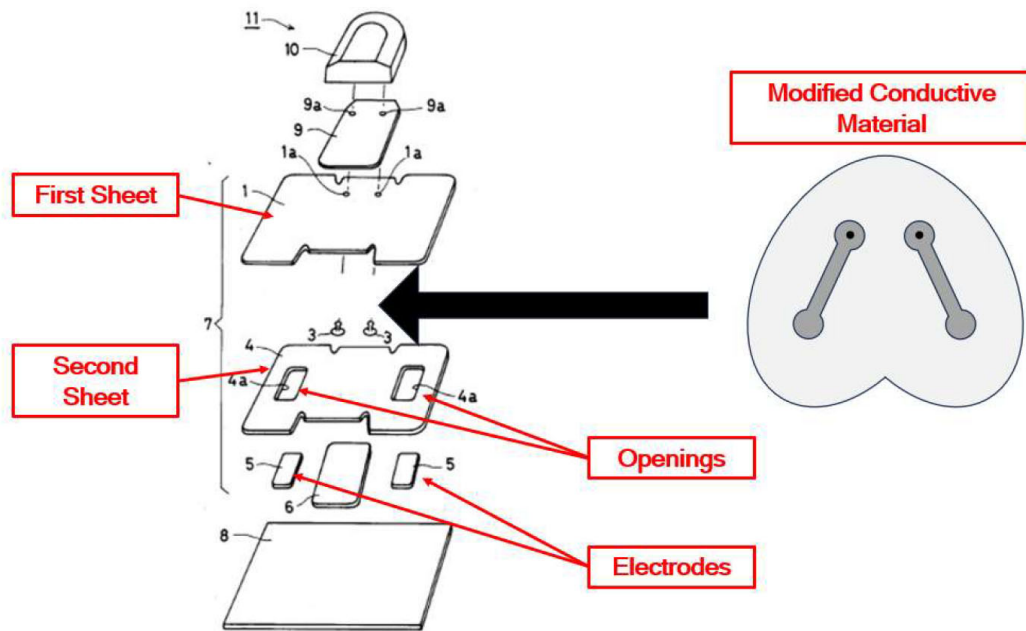
Ex. 1012, Figure 1 (annotated).

Even worse, a POSA would have known that replacing the conductive rods and hooks with insulating material and printed conductive traces, respectively, would “render[] [Matsumura] inoperable for its intended purpose.” *In re Gordon*, 733 F.2d 900, 902 (Fed. Cir. 1984); Ex. 2014, ¶[0075]. This is because without the conductive rods and hooks, the bioelectric signals could not be transmitted from conductive gel 5, through conductive material 2, and through hooks 3 to reach the signal processor. Ex. 1012, ¶[0019]; Ex. 2014, ¶[0076].

In some instances, the Petition identifies the hooks as traces. Petition, 35 (“the electrodes (conductive gel 5), sensor contacts (conductive material 2), and *traces*

(hooks 3)” (emphasis added)). That description is consistent with *Matsumura*’s disclosure that “the protruding portion of the hook 3 [] transmits the bioelectric potential” to the signal processor. Ex. 1012, ¶[0023]. Yet, the Petition somehow concludes that a POSA would have modified *Matsumura* to replace the conductive rods with a sheet of insulating material with printed conductive traces, thereby eliminating the hooks as the traces. A POSA would not have made such a modification because the protruding hooks are necessary to carry the bioelectric signals to the processor. Ex. 2014, ¶[0076].

To support its position, Petitioner uses clip art as “modified conductive material,” which it then inserts in a self-serving location within Figure 1 to suggest that a POSA would have known that conductive rods 2 could be replaced with a flexible printed circuit layer made from insulating material.



Petition, 19 (annotating Ex. 1012, Figure 1).

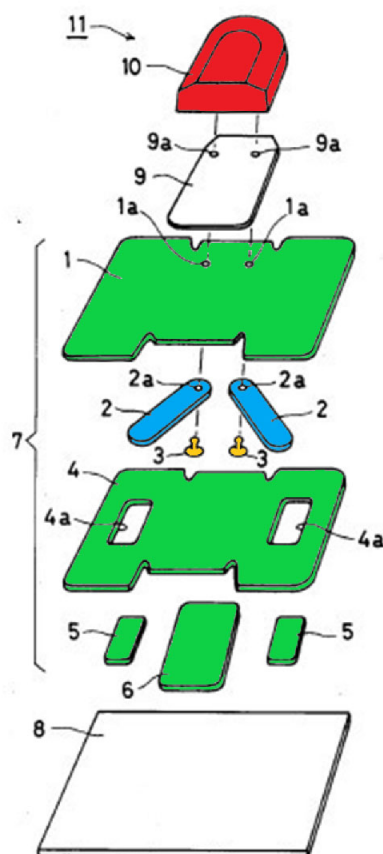
Petitioner identifies no disclosure within *Matsumura* nor any knowledge of a POSA suggesting the replacement of conductive rods with a sheet of insulating material and printed traces and placing it in the middle of Figure 1. Instead, the Petition relies on four paragraphs of the expert declaration, which in turn relies on a non-prior art reference as support for this modification. Petition, ¶¶18-19 (citing Ex. 1009, ¶¶781-84, which in turn cites Ex. 1035, a non-prior art reference). Therefore, the Petition's illustration of Figure 1 is merely the application of hindsight—unsupported by any disclosure in the reference itself—to meet the claim limitation. Ex. 2014, ¶[0077].

The Petition ignores the express teachings of *Matsumura*. Ex. 2014, ¶[0078]. *Matsumura*'s disclosure is explicit: "two pieces of conductive material 2 and two hooks 3 are arranged to transmit the bioelectric potential detected by the conductive gel 5." Ex. 1012, ¶[0019]. Further, *Matsumura* is clear that "[t]he bioelectric pad 7 and the signal processor 10 are detachable with hooks." Ex. 1012, ¶[0016]. Accordingly, the three-dimensional structures of both conductive rod 2 and hook 3 are necessary for the electrical and mechanical connections, and a POSA would not have been motivated to replace them with printed circuitry. Ex. 2014, ¶[0079].

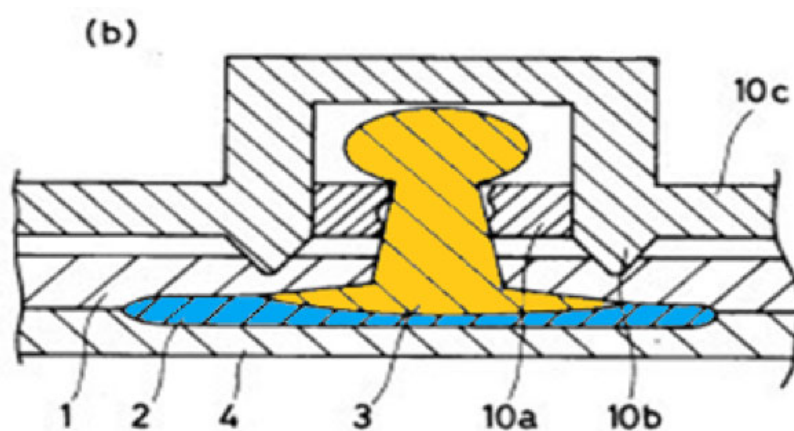
Finally, the Petition fails to render obvious the requirement that the printed circuit layer is made from an insulating material. *Matsumura* does not teach a flexible printed circuit layer made from an insulating material. Petition, 18. The Petition does not rely on *any* other references to teach this limitation in Ground 1. *Id.* This ground necessarily fails by Petitioner's own admission. Ex. 2014, ¶[0080].

b. *Matsumura*'s electronics do not extend between a connection pad and a conductive surface

Matsumura's conductive rods 2 and hooks 3 do not extend from the electrode gel to any connection pad, and the Petition ignores *Matsumura*'s disclosure to the contrary. Ex. 2014, ¶[0071]. *Matsumura* includes conductive rods 2 and hooks 3 protrude vertically through multiple layers of the bio-pad. Ex. 1012, ¶[0019], Figures 1, 4(b) (annotated below).



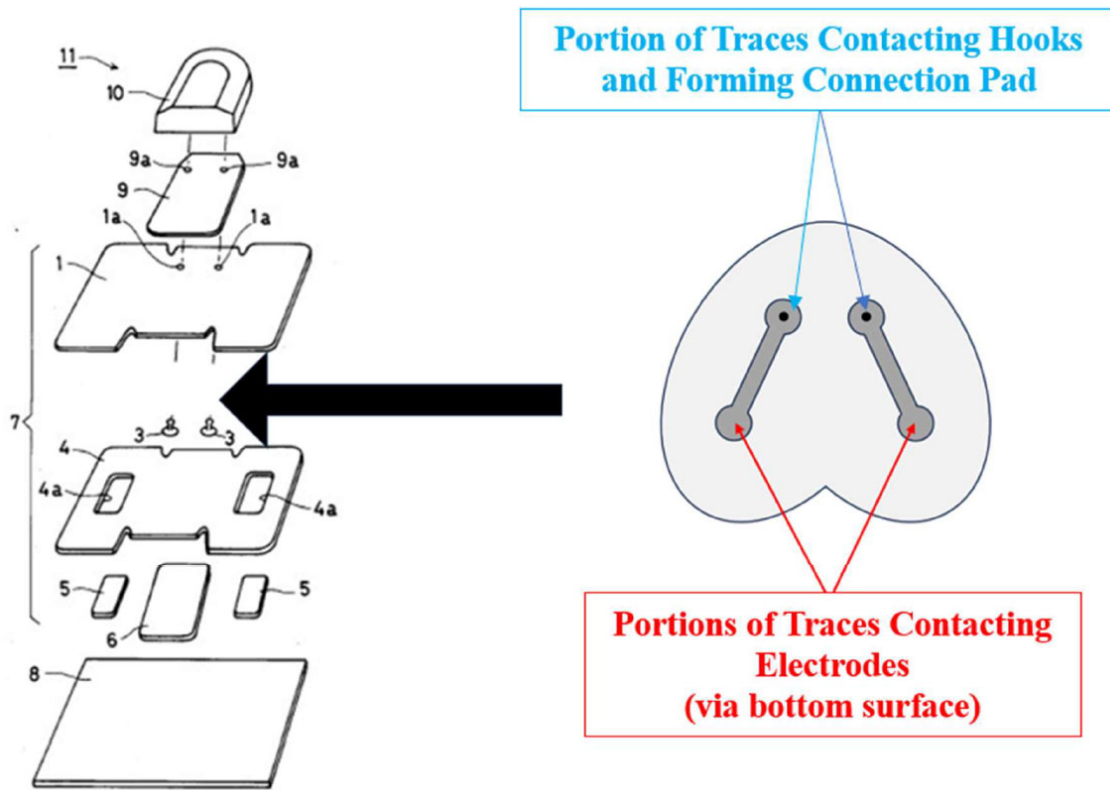
Ex. 1012, Figure 1 (annotated); Ex. 2014, ¶[0054].



Ex. 1012, Figure 4(b) (annotated); Ex. 2014, ¶[0074].

Matsumura’s hooks 3 “are arranged so that the protruding portions of the hook 3 can be inserted through the holes 2a and 1a from the back side of the conductive material 2.” Ex. 1012, ¶[0019]. *Matsumura*’s conductive rods 2 and hooks 3 are located “[b]etween the first sheet 1 and the second sheet 4” which is critical “to transmit the bioelectric potential detected by the conductive gel 5, which is placed in the openings 4a of the second sheet 4,” Ex. 1012, ¶[0019]. This configuration is also critical for waterproofing *Matsumura*’s device. Ex. 1012, ¶¶[0018]-[0019]; Ex. 2014, ¶[0076]. Specifically, first sheet 1 and second sheet 4 are made of insulating material for preventing moisture from penetrating the device, and they must surround the conductive rod and hook in a compact layered manner to do so, as *Matsumura* teaches. Ex. 1012, ¶¶[0017]-[0019].

The Petition’s reliance on its unsupported clip art (reproduced below) does not remedy this deficiency. Ex. 2014, ¶¶[0070], [0078]-[0079]; Petition, 22-23.



Petition, 22. Petitioner’s clip art fails to establish *Matsumura*’s electronics “extending between” a connection pad and electrode. Petitioner identifies no disclosure within *Matsumura* nor any knowledge of a POSA suggesting the replacement of conductive rods with a sheet of insulating material and printed traces and placing it in the middle of Figure 1. Worse still, Petitioner does not identify any disclosure in *Matsumura* or knowledge of a POSA suggesting that a POSA would understand this modification to be a trace “extending between” a connection pad an electrode. Therefore, the Petition’s illustration of Figure 1 is merely the application of hindsight—unsupported by any disclosure in the reference itself—to meet the

claim limitation. Ex. 2014, ¶[0079]. *Matsumura* unequivocally requires conductive rods 2 and hooks 3 that traverse vertically through multiple layers and mechanically “hook” or clamp onto signal processor 10. Ex. 1012, ¶¶[0016], [0019], [0021]; Ex. 2014, ¶¶[0074], [0080]. Accordingly, the Petition fails to teach or suggest the “at least one electrical trace extending between the at least one connection pad and a conductive surface of the at least one electrode” of Claim 1.

- i. The Petition’s challenge regarding “extending between” fails as a matter of law and technically

As best as Petitioner’s challenge can be understood on the “extending between” element as it relates to *Matsumura*, it fails. Petition, 22-23. First, the Petition did not apply the *Phillips* framework. Petition, 2. Second, even if considered, the Petition’s construction of “extending between” fails on the merits because the apparent interpretation is unreasonably broad, obviating any limitation from this element and as a result fails to establish that *Matsumura* renders obvious the “extending between” in Claim 1.

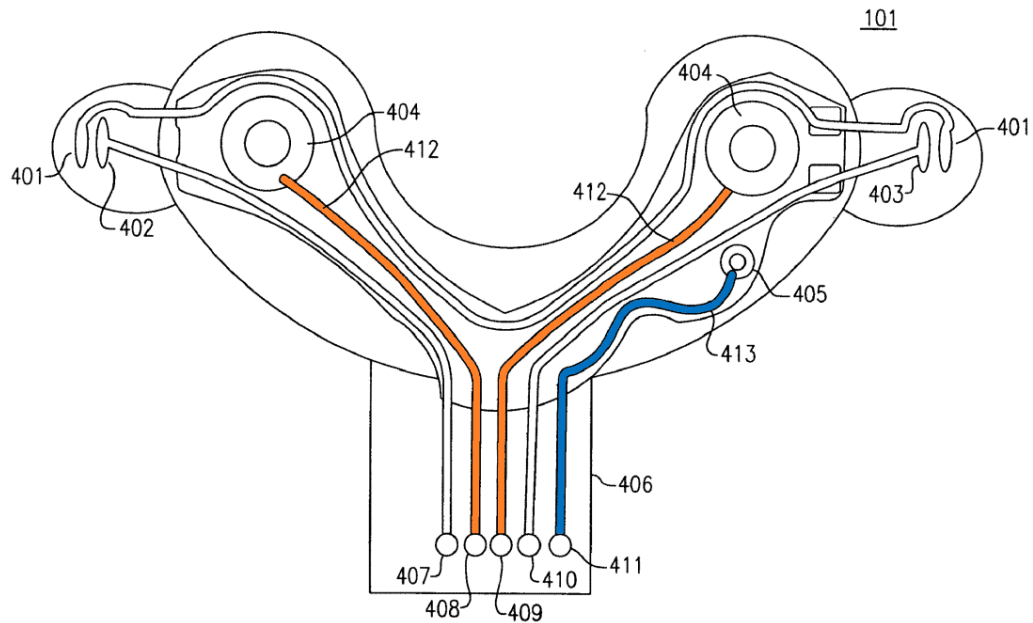
- ii. The Petition did not provide a construction under the legally proper *Phillips* framework

Because the Petition hides behind the “ordinary and customary meaning” for all claim terms, the Board is left to guess the Petition’s actual position on “extending between.” Petition, 2. In its analysis, the Petition seemingly construes “extending

between” to include anything electrically coupled, without requiring the trace to extend directly between a connection pad and the conductive surface of an electrode, obviating the very claim language of Claim 1. Ex. 2014, ¶[0080]; Petition, 21-23.

- iii. The Petition’s construction of “extending between” ignores the disclosure of the ’492 Patent

A proper claim construction analysis considers the intrinsic evidence of the ’492 Patent, which the Petition ignores. Petition, 22-23. The ’492 Patent explains that “[t]races 412 *extend[] between* conductive surface 404 and connection pads 408 and 409.” Ex. 1004, 7:50-55; Ex. 2014, ¶[0046]. These traces 412 (orange) are shown below in Figure 4A. Ex. 1004, 7:50-55, Figure 4A (annotated). In other example, a trace 413 (blue) “*extend[s] between* conductive surface 405 and connection pad 411.” Ex. 1004, 7:50-55, Figure 4A (annotated); Ex. 2014, ¶[0046]. The ’492 Patent explains that the trace 413 can connect contact pad 405 to the connection pad 411 “to provide a *direct-connected* reference electrode.” Ex. 1004, 7:50-55; Ex. 2014, ¶[0046].



Ex. 1004, Figure 4A (annotated); Ex. 2014, ¶[0046].

These examples show that the '492 Patent uses “extending between” as extending directly between two components that are flush to the bio-pad. Ex. 1004, 7:50-55, Figure 4A (annotated); Ex. 2014, ¶[0082]. This disclosure does not provide for the Petition’s rendition of “connection pad” that is a point of contact between *Matsumura*’s protruding hook and the improper trace in Petitioner’s clip art. Petition, 21-23; Ex. 2014, ¶¶[0070], [0082].

The Petition, recognizing the limits of the art it elected for its challenge, disregards the teachings of the '492 Patent in an effort to render its claims obvious. But this attempt should be denied because it fails to both present a cognizable claim

construction theory, and if proper would vitiate the actual claim language, rendering the claim element moot, which cannot be correct.

Therefore, the Petition's implicit and improperly broad construction of "extending between" fails.

ii. The Petition Fails to Establish a Motivation to Combine and Modify *Matsumura* and *Kroll*

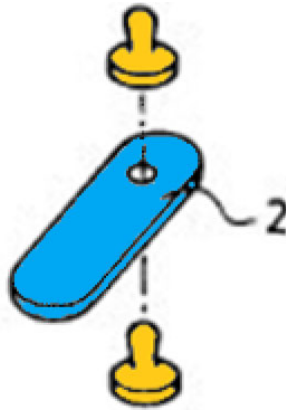
a. A POSA Would Not Have Been Motivated to Replace *Matsumura*'s Conductive Material with Insulating Material

Atop admitting that *Matsumura* fails to teach or suggest the claimed layer, (*supra* Section VI.A.i.a.), *Matsumura*, in fact, affirmatively ***requires*** teachings that are at odds with the claimed invention.

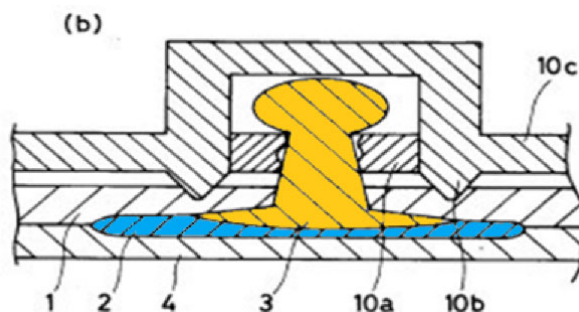
Matsumura is clear that its bioelectrode pad comprises "conductive material 2," conductive "hook 3," and "conductive gel 5." Ex. 1012, ¶[0016]. These conductive materials are essential to the operation of *Matsumura*'s waterproof design. *See, e.g.*, Ex. 1012, ¶[0006].

In this regard, *Matsumura*'s processor and housing are located separate and apart from the bioelectric pad. Ex. 1012, ¶[0016], Figures 1-2; Ex. 2014, ¶[0081]. To accomplish the waterproof design, there must be a vertical conductive protrusion that allows for the electrical flow of signals from the bio-pad to the processor. Ex. 1012, ¶¶[0024], [0027], Figures 4-5; Ex. 2014, ¶¶[0074], [0076], [0079]. It is clear

from Figures 4 and 5 that to provide this waterproof design, the rigid nature of conductive rods 2 provides a stable support for hook 3 to clamp. Ex. 1012, ¶¶[0019], [0021], Figures 4-5; Ex. 2014, ¶[0074]. Specifically, “the protruding portions of the hook 3” extend upwards “from the back side of the conductive material 2,” clamping both sides of conductive rod 2. Ex. 1012, ¶[0021], Figures 4(b) (annotated), 8 (annotated); Ex. 2014, ¶[0074]. The organization of these components was not by accident but rather provides the electro-mechanical connection essential to *Matsumura’s* device. Ex. 1012, ¶[0019]; Ex. 2014, ¶[0074].



Ex. 1012, Figure 8 (annotated); Ex. 2014, ¶[0074].



Ex. 1012, Figure 4(b) (annotated); Ex. 2014, ¶[0074].

In the face of *Matsumura*'s express teachings, the Petition proposes removing conductive rods and protruding hooks and replacing them with a sheet of insulating material and printed "traces," for no other reason than to reach the claims. Nothing in *Matsumura*, the single reference used in this ground, suggests the replacement of these rigid conductive rods.

Instead, the Petition and its expert simply allege that "[a] POSA would modify this conductive material to form a flexible printed circuit layer made from an insulating material and defining a substrate, as a circuit layer must be formed on insulating material." Petition, 18. This is nothing more than hindsight driven efforts to arrive at the claim.

Even worse, Petitioner relies on only four paragraphs of its expert declaration, which in turn relies solely on non-prior art: Ex. 1035, a book published on December 22, 2006 (*i.e.*, published after the priority date of the '492 Patent), and a clip art drawing seemingly created by the expert specifically for the Petition filed on December 23, 2024. Petition at 18-19, (citing Ex. 1009, ¶¶781-84). Without any plausible support, Petitioner's ultimate opinion that "at the time of the invention of the Challenged Patents, it was well-known that silver and/or silver chloride electrodes, connectors, or traces could be created using the screen-printing technique" carries no weight. Ex. 1009, ¶782; Ex. 2014, ¶[0076]. Ultimately,

Petitioner's challenge amounts to nothing more than "different technology was independently known." This fails. *Virtek Vision Int'l ULC v. Assembly Guidance Sys. Inc.*, 97 F.4th 882, 888 (Fed. Cir. 2024) (explaining arguments "grounded in the fact that the claim elements are known in the prior art" without more "does not show a motivation to combine").

In support of this substantial modification, Petitioner's expert concludes, without any basis, that this alleged change would be made "to reduce the manufacturing costs associated with manufacturing the parts." Ex. 1009, ¶783. Dr. Heikenfeld provides no evidence of this "cost savings" opinion. *Id.* The PTAB has long held that conclusory expert testimony is to be given little weight. *TQ Delta, LLC v. CISCO Sys., Inc.*, 942 F.3d 1352, 1358-59 (Fed. Cir. 2021).

b. Replacing the Conductive Material with Insulating Material Would Frustrate *Matsumura's* Goal of a Waterproof Device

Replacing *Matsumura's* conductive rods and hooks with an insulating layer and printed traces would directly undermine the waterproof functionality central to *Matsumura's* device. Ex. 2014, [0079]. *Matsumura* discloses:

By using the structure described above, the housing of the signal processor 10, the part that transmits bioelectric potential from the bioelectrode pad 7 to the signal processor 10, i.e. engagement portion between the protruding part of the hook 3 and the hook engagement portion 10a is waterproofed, thus the entire bioelectric potential detector 11 is waterproofed.

Ex. 1012, ¶[0027]. A POSA would not have been motivated to replace the conductive rods 2, to which the hook “clamps” onto both sides, with an insulating layer that traces are printed on top of. Ex. 1012, ¶[0021]; Ex. 2014, ¶¶[0074], [0081]. A POSA would have known that the hooks are necessary for waterproofing “the entire bioelectric potential detector” as described above. Ex. 1012, ¶¶[0027]-[0030]; Ex. 2014, ¶¶[0076], [0079]. The Petition is silent with regard to the device being waterproof and fails to recognize or address the hooks’ electrical and mechanical role altogether. Ex. 2014, ¶[0074].

c. A POSA Would Not Have Been Motivated by *Kroll* to Reduce the Size of *Matsumura*’s Device

Replacing *Matsumura*’s conductive rods and conductive hooks with a sheet of insulating material and printed electrical traces destroys the electro-mechanical structure of *Matsumura* necessary for the device to function as intended. For this element, the Petition identifies *Matsumura*’s modified conductive material 2 as an insulating sheet that “contained printed (ink) electrical traces.” Petition, 23. The Petition relies on *Kroll*’s “printed ink lead strips” to further modify *Matsumura*, arguing that “a POSA would have understood [ink lead strips] as traces made in least in part of resistive material.” Petition, 23-24 (citing Ex. 1013, 5:4-13; Ex. 1009 ¶¶798, 803). The proposed combinations ((1) *Matsumura* and “general knowledge” to obtain a printed circuit layer, and (2) *Matsumura* and *Kroll* to further modify the

printed circuit layer to be made of resistive ink) are two critical steps removed from *Matsumura's* device, and a POSA would not have been motivated to make these modifications. Ex. 2014, ¶[0092].

Even if a POSA would be motivated to modify conductive material 2 to be a printed insulating sheet and hooks 3 to be a printed resistive trace, *Matsumura* is explicit that “**conductive** material 2” and hooks 3 are indeed conductive—not resistive. Ex. 1012, ¶¶[0019]-[0021]; Ex. 2014, ¶[0093]. Notably, *Matsumura* provides two options of material that may comprise conductive material 2, and it does not include a predominantly resistive material, let alone ink lead strips. Ex. 1012, [0020]; Ex. 2014, ¶[0093]. It is clear that to arrive at the Challenged Claims, the Petitioner uses Claim 1 as a guide to modify *Matsumura*, removing its conductive rods and conductive protruding hooks and replacing the same with *Kroll's* insulating material and printed ink traces, respectively. This is blatant hindsight reconstruction. In view of the actual teachings of *Matsumura* and *Kroll*, it becomes clear that a POSA would not have been motivated to make this modification, and the Petition offers these modifications solely to reconstruct the Challenged Claims.

d. A POSA Would Not Have Been Motivated by *Kroll* to
Add Resistive Strips to Protect the Patient

The Petition's suggestion to incorporate *Kroll's* resistive ink strips into *Matsumura's* design does not arise from the teachings of either reference. Ex. 2014,

¶¶[0095]-[0096]. *Kroll's* ink lead strips are intended for different purposes— to protect the patient (*i.e.*, current from the device to the patient). However, there is no motivation provided to suggest that these resistive materials would enhance *Matsumura's* waterproofing or bioelectric signal transmission, and the Petition fails to establish any compelling reason why a POSA would seek to replace *Matsumura's* conductive material with resistive lead strips. Ex. 2014, ¶¶[0096]-[0099].

Moreover, the combination of *Matsumura* and *Kroll* is two steps removed from the original invention and is artificially constructed to mirror the Challenged Claims. The Petition first assumes that a POSA would be motivated to modify *Matsumura's* conductive material and conductive hook into an insulating sheet and printed traces, respectively, and then alter them further with resistive ink—a combination of modifications that is not naturally suggested by either reference. Ex. 2014, ¶[0092].

Additionally, *Matsumura* itself is explicit about the conductive nature of its materials, specifically stating that the conductive materials are either carbon or PET with conductive coatings like Ag/AgCl. Ex. 1012, ¶[0020]; Ex. 2014, ¶[0093]. There is no suggestion in *Matsumura* that the conductive materials should or could be replaced with resistive ink, nor does the reference provide any indication that resistive materials would function equivalently in this context. Ex. 2014, ¶[0093].

Thus, any proposed modification based on *Kroll's* resistive ink strips would contradict *Matsumura's* explicit teachings. Ex. 2014, ¶[0093]. Although it is a standard characteristic of all conductive materials (indeed, all materials generally) to have some resistance, this does not mean that conductors and resistors are interchangeable or functionally equivalent. Ex. 2014, ¶[0093]. *Matsumura* specifically discloses two options for the makeup of conductive material 2, both requiring conductive material 2 to be entirely covered in a conductive material, and neither option resulting in a predominantly resistive material, let alone a resistive lead strip. Ex. 2014, ¶[0093]; Ex. 1012, ¶[0020].

The Petition's reliance on *Kroll* to suggest a modification to *Matsumura* is not only unmotivated but also illogical. The two-step modification (first, replacing conductive material with printed conductive material and second, modifying that material to include resistive properties) is unsupported by the references and is purely hindsight reconstruction. Ex. 2014, ¶¶[0091]-[0093]. This is particularly glaring given that the Petition improperly injects a motivation add *Kroll's* resistive strips to replace “conventional resistors in [*Matsumura's*] signal processor” even though *Matsumura* does not teach or suggest, in any way, that it relies on conventional resistors in its signal processor. Ex. 2014, ¶[0094]. The Petition is impermissibly “defining the problem” *Kroll* addresses “in terms of [the] solution”

Kroll discloses, which constitutes improper hindsight reasoning. *Shenzhen Buxiang Network Tech. Co., Ltd. v. Sun Pleasure Co. Ltd.*, No. 2022-1912, 2024 WL 3451830, at *6 (Fed. Cir. July 18, 2024) (affirming PTAB’s decision that claims were not unpatentable).

A POSA would not have been motivated to combine *Matsumura*’s teachings with the “general knowledge” further with *Kroll*’s resistive ink strips, as doing so would undermine the device’s core functionality and mechanical structure. Ex. 2014, ¶¶[0094]-[0098]. Therefore, the Petition’s proposed modification fails to render the Challenged Claims obvious. Ex. 2014, ¶[0099].

iii. Matsumura fails under Rule 42.63(b)

Petitioner fails to establish that the alleged translation for *Matsumura* (Ex. 1012) is accurate or reflects the Japanese version (Ex. 1065). A complete translation of a foreign language document must be submitted. *Toyota Motor N. Am., Inc. v. Cruise Control Techs., LLC*, IPR2014-00280, Paper 17 at 6-7 (P.T.A.B. July 2, 2014). “When a party relies on a document or is required to produce a document in a language other than English, a translation of *the document* into English and an affidavit attesting to the accuracy of *the translation* must be filed with the document.” *Toyota Motor N. Am., Inc.*, IPR2014-00280, Paper 17 at 6 (quoting 37 C.F.R. § 42.63(b) (2017)) (emphasis in original).

While the Petition alleges that Exhibit 1066 is a certified translation of the document submitted as Exhibit 1065 (the Japanese Pat. Pub. 2004/121360 to *Matsumura*), (Petition, viii), Exhibit 1066 does not identify or even refer to the document submitted as Exhibit 1065, nor does Exhibit 1066 identify or refer to the purported English language version of *Matsumura* submitted as Exhibit 1012. Instead, the translation states, “This is to certify that the above-referenced document 403-45924_JP2004121360A_JA into EN has been translated from Japanese into English.” Ex. 1066. Petitioner did not submit in this proceeding any document that is titled or referred to as “403-45924_JP2004121360A_JA.” Nothing in Exhibit 1066 links the certification to *Matsumura* (either the Japanese language version (Ex. 1065) or the English language version (Ex. 1012)). *See* Exs. 1065, 1066 and 1012. Ex. 1012 should be ignored and Grounds 1 and 3 fail.

B. Ground 2 Fails to Render Obvious the Challenged Claims

The combination of *Jensen*, *Kroll*, and the Petition’s amorphous “general knowledge” fails to teach or suggest the “at least one electrical trace” in Claim 1. Rather than properly construe this element and provide a clear position, the Petition hides behind the “ordinary and customary meaning.” Petition, 2. But when applying a proper construction, the Petition cannot render obvious the “electrical trace.” Any implicit construction by the Petition should be ignored, for both a procedural failing

and a failing on the merits. Moreover, the Petition fails to establish a motivation to combine *Jensen* and *Kroll*. To arrive at the Challenged Claims, the Petition uses Claim 1 as a guide to modify *Jensen*, removing its conventional resistors and replacing the same with *Kroll*'s lead strips.

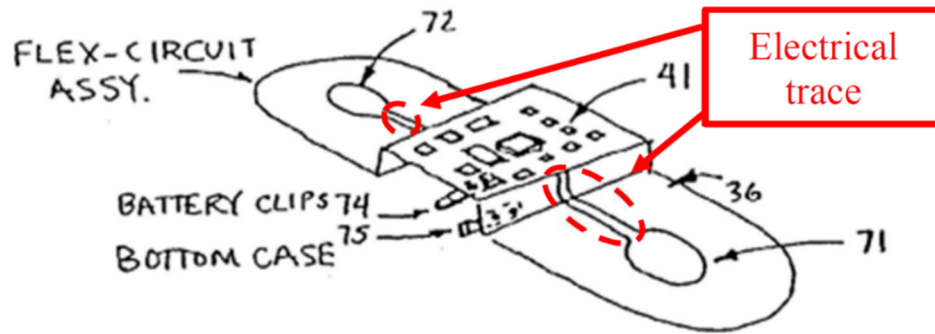
i. The Non-obvious Combination of *Jensen* and *Kroll* Fails to Teach or Suggest Every Element of Claim 1

Even assuming a POSA would have combined *Jensen* and *Kroll* (they would have not), the non-obvious combination fails to render obvious Claim 1. Section VI.B.ii (explaining the Petition's failure to establish a motivation to combine). Specifically, *Jensen* does not render obvious the claimed "electrical trace" because *Jensen*'s wiring does not "extend[]" between the at least one connection pad and a conductive surface." Ex. 1003, Cl. 1; Ex. 2014, ¶[0127]. *Jensen*'s disclosure supports this position and contradicts the Petition's bare conclusion that a POSA "would understand" this element to be met. Petition, 40-41. Further, the Petition's implicit construction of "extending between" is improper and should be ignored.

a. *Jensen*'s wiring does not extend between a connection pad and a conductive surface

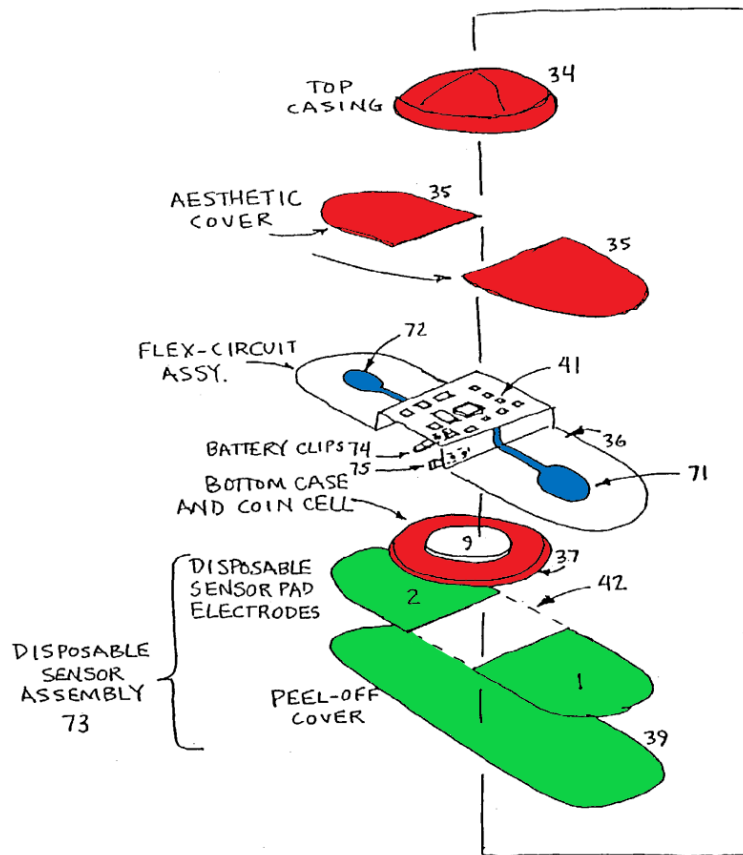
Jensen's wiring does not extend from the electrode sensor pads to the connection pad, and the Petition ignores *Jensen*'s disclosure to conclude otherwise. Ex. 2014, ¶¶[0129]-[0130]; Petition, 39-40 (identifying *Jensen*'s pads 48 as the

recited connection pad). The Petition's annotations to Figure 5 confirm this conclusion. Ex. 2014, ¶[0131]; Petition, 40-41 (annotating Figure 5).



Ex. 1011, Figure 5 (Petition's original annotations).

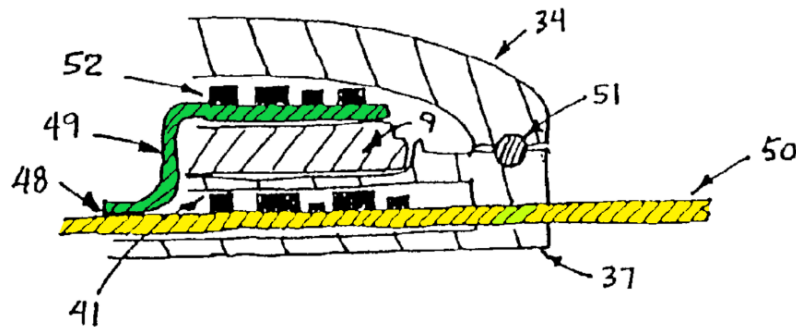
In Figure 5, *Jensen's* wiring, which is part of *Jensen's* flexible circuit assembly 36, extends from sensor pads 71, 72 to the electronics circuit 41. Ex. 2014, ¶[0131]; Petition, 40-41. Thus, the wiring connects electronics circuit 41 to sensor contacts 71, 72 and the battery (not shown). Ex. 2014, ¶[0131]; Ex. 1011, ¶[0040]. *Jensen's* wiring does not extend to contact pad 48 nor can they as Figure 5 **does not even include** connection pads 48. Ex. 2014, ¶[0131]; Ex. 1011, Figure 5; *see also* Ex. 1003, Figure 5 (indicating *Jensen's* wiring in blue).



Ex. 1011, Figure 5 (annotated); Ex. 2014, ¶[0049].

The Petition’s reliance on an entirely different embodiment does not remedy this deficiency. Ex. 2014, ¶[0132]; *see* Petition, 41. Namely, Figure 8 does not provide electrical traces that extend from the sensor pads to the connection pad. Ex. 2014, ¶[0132]. *Jensen* provides two flexible printed circuits. Ex. 1011, ¶[0046], Figure 8. These circuits are connected via “a set of pads 48” that are heat re-flowed together. Ex. 1011, ¶[0046]. *Jensen’s* pads are a different component than its wiring. *Jensen’s* wiring does not connect to pads 48, and the wiring does not extend from the pads to the sensor. Ex. 2014, ¶[0132]. Thus, Figure 8 of *Jensen* does not

provide wiring or provide any disclosure regarding traces that connect to pads 48 as the Petition contends. Ex. 1011, ¶[0046]; Ex. 2014, ¶[0132].



Ex. 1011, Figure 8 (annotated); Ex. 2014, ¶[00132].

In view of *Jensen's* teachings, the Petition's issues are twofold: (1) *Jensen* provides zero disclosure (and the Petition points to none) that its wiring in Figure 5 extend to its pads 48 in Figure 8 (*i.e.*, it does not extend between sensor pad 71 and pad 48); and (2) *Jensen's* only relevant disclosure shows the opposite—its wiring ***does not*** extend from the sensor to the pads. Petition, 40-41. The Petition's bare conclusion that a "POSA would understand" that *Jensen's* wiring matches the structure of the claim language does not satisfy its burden. Accordingly, the Petition fails to teach or suggest the "at least one electrical trace" as recited in Claim 1.

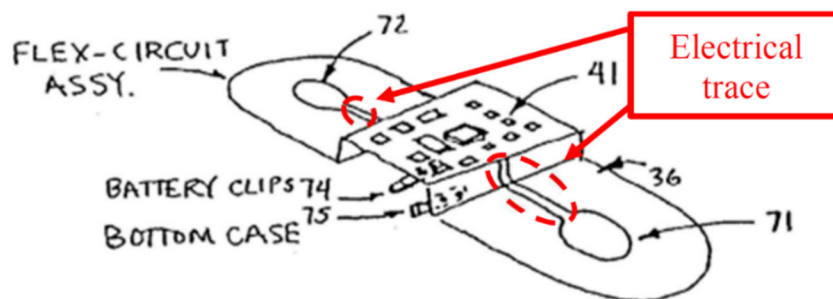
- b. The Petition's challenge regarding "extending between" fails as a matter of law and technically

As best as Petitioner's challenge can be understood on the "extending between" element as it relates to *Jensen*, it fails. Petition, 40-41. First, the Petition

did not apply the *Phillips* framework. Petition, 2. Second, even if considered, the Petition’s construction of “extending between” fails on the merits because the apparent interpretation is unreasonably broad, obviating any limitation from this element and as a result fails to establish that *Jensen* renders obvious the “extending between” in Claim 1.

- i. The Petition did not provide a construction under the legally proper *Phillips* framework

Because the Petition hides behind the “ordinary and customary meaning” for all claim terms, the Board is left to guess the Petition’s actual position on “extending between.” Petition, 2. In its analysis, the Petition appears to construe “extending between” to include anything electrically coupled, without requiring the trace to extend directly between the connection pad and the conductive surface, obviating the very claim language present in Claim 1. Ex. 2014, ¶[0133]; Petition, 40-41. For example, relying on Figure 5, the Petition identifies wiring that connects the electronics circuit 41 to the sensor contacts 71, 72. *Id.*

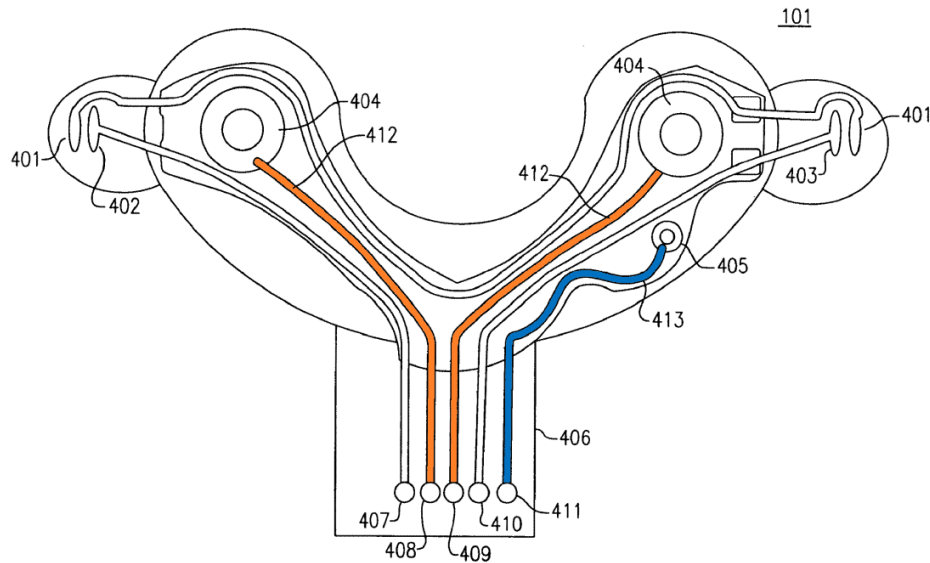


Ex. 1011, Figure 5 (Petition’s original annotations).

Based on Figures 5 and 8, the Petition contends that the wiring “extend[s] from the electrode sensor pads 1, 2 (*i.e.*, ‘the conductive surface of at least one electrode’) to connection pad 48.” Petition, 40-41. The only way to reconcile Figure 5 (showing *Jensen’s* wiring extending from sensor contacts and ending at the electronic circuit) and the Petition’s argument (the traces extend from the sensor pads to the connection pad) is to broadly construe “extending between” to capture anything that is electrically coupled, in any way, by *Jensen’s* wiring. Ex. 2014, ¶[0135]. The Petition’s application of this broad construction without actually construing “extending between,” is improper and should be ignored.

- ii. The Petition’s construction of “extending between” ignores the disclosure of the ’492 Patent

A proper claim construction analysis considers the intrinsic evidence of the ’492 Patent, which the Petition ignores. Petition, 40-41. The ’492 Patent explains that “[t]races 412 ***extend[] between*** conductive surface 404 and connection pads 408 and 409.” Ex. 1004, 7:50-55. These traces 412 (orange) are shown below in Figure 4A. Ex. 1004, 7:50-55, Figure 4A (annotated). In other example, a trace 413 (blue) “***extend[s] between*** conductive surface 405 and connection pad 411.” Ex. 1004, 7:50-55, Figure 4A (annotated). The ’492 Patent explains that the trace 413 can connect contact pad 405 to the connection pad 411 “to provide a ***direct-connected*** reference electrode.” Ex. 1004, 7:50-55.



Ex. 1004, Figure 4A (annotated); Ex. 2014, ¶[0135].

These examples show that the '492 Patent uses “extending between” as extending directly between two components. Ex. 1004, 7:50-55, Figure 4A (annotated); Ex. 2014, ¶¶[0135]-[0136].

The Petition, recognizing the limits of the art it elected for its challenge, disregards the teachings of the '492 Patent in an effort to render its claims obvious. But this attempt should be denied because it fails to both present a cognizable claim construction theory, and if proper would vitiate the actual claim language, rendering the claim element moot, which cannot be correct.

Therefore, the Petition’s implicit and improperly broad construction of “extending between” fails.

ii. The Petition Fails to Establish a Motivation to Combine *Jensen* and *Kroll*

The Petition fails to establish that a POSA would have been motivated to combine *Jensen* and *Kroll* based on either a desire to limit current or a desire to make *Jensen*'s device smaller. Petition, 35-37. A POSA would not have been motivated to incorporate *Kroll*'s lead strips into *Jensen*'s device to limit current because a POSA would have recognized that this would provide no benefit. "Jensen's goal of reducing the size of the device" likewise fails to provide a motivation to combine. *Jensen* already achieves its size goals with conventional resistors. These cursory alleged motivations are exactly the type that the Board rejects as underdeveloped and not rooted in the actual references. *TQ Delta, LLC v. CISCO Sys., Inc.*, 942 F.3d 1352, 1359 (Fed. Cir. 2019).

The Petition fails to establish a motivation to combine *Jensen* and *Kroll* and thus cannot render obvious any of the Challenged Claims in Ground 2.

a. A POSA would not have been motivated to combine *Jensen* and *Kroll* to limit the current

A POSA would not have been motivated to incorporate *Kroll*'s lead strips into *Jensen*'s device to limit the current between *Jensen*'s device and the patient. Petition, 35-36. *Jensen*'s device monitors the patient and does not transmit any current to the patient. Thus, there would be no motivation for a POSA to limit

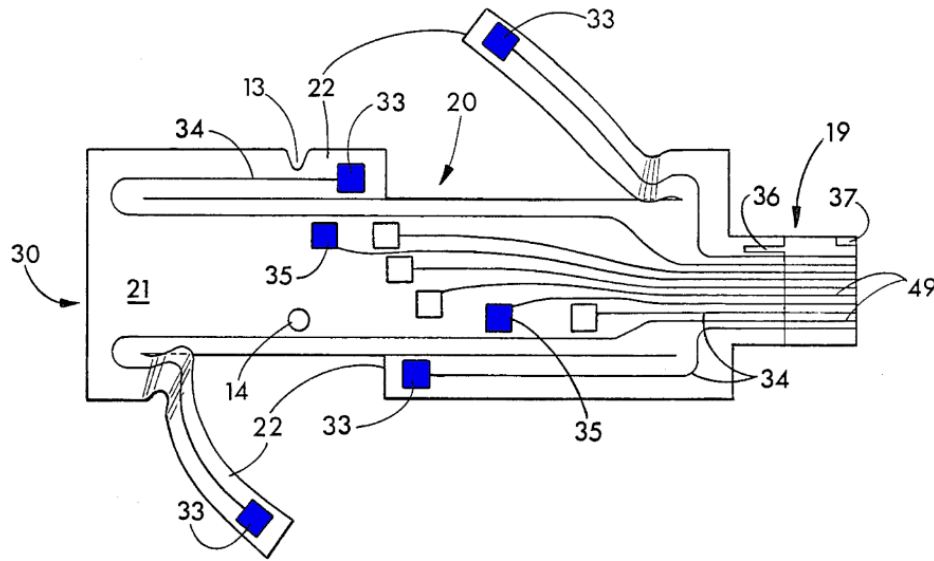
current (as there is none) from the device to the patient. Neither would a POSA be motivated to incorporate *Kroll's* lead strips into *Jensen's* device to limit current between the patient and the device to protect *Jensen's* electronics. Petition, 35-36. *Kroll's* lead strips are designed to protect the patient (*i.e.*, current from the device to the patient), and a POSA would have understood that *Kroll's* lead strips would not protect *Jensen's* electronics.

- i.* A POSA would not have been motivated to limit the current from *Jensen's* device to the patient

Unlike *Kroll's* therapeutic device, *Jensen's* device only monitors ECG signals; it **does not** transmit current to the patient. Ex. 2014, ¶[0144]. Thus, contrary to the Petition's argument, a POSA would not have been motivated to limit the current (as there is none) from *Jensen's* device to the patient. Ex. 2014, ¶¶[0138], [0144]; Petition, 35-36 (arguing that it would be beneficial to limit the current transmitted from *Jensen's* device to the patient).

As introduced in Section IV.C, *Kroll* provides a disposable electrode belt “for receiving and transmitting electric current and voltage.” Ex. 1013, 2:41-47. Figure 4 shows the electrodes (indicated in blue) of *Kroll's* disposable electrode belt. Ex. 1013, 4:48-68, Figure 4A (annotated). Each electrode “transmit[s] and receive[s] electric signals” over its respective lead strips. Ex. 1013, 5:1-4. “[T]o protect a patient from shock due to malfunction of the device 20 or of a complementary

medical device,” the lead strips may provide a “certain total lead strip resistance,” thereby serving as a current limiter. Ex. 2014, ¶[0141]; Ex. 1013, 5:4-13.



Ex. 1013, Figure 4A (annotated); Ex. 2014, ¶[0141].

Because *Kroll* provides a therapeutic device that transmits electrical current to the patient, a POSA would have understood that lead strips may protect the patient from shock by limiting the current from the device to the patient. Ex. 2014, ¶[0142]; Petition, 35. This same understanding does not apply to *Jensen* because *Jensen* only monitors the patient. Ex. 2014, ¶[0143]. *Jensen* provides a patch that “sense[s] the heart-rate voltage differential across [its] sensors.” Ex. 1011, Abstract. The signals are then amplified, converted to an output format, and transmitted to receiving equipment. Ex. 2014, ¶[0143]; Ex. 1011, Abstract; *see also* Ex. 1011, ¶[0054].

Jensen does not provide any disclosure on transmitting an electrical signal from its device to the patient. Ex. 2014, ¶[0144]. Neither does *Jensen* provide a reason to transmit electrical signals or disclose components that would allow such function. Ex. 2014, ¶[0144]. Consistent with this disclosure, the Petition repeatedly characterizes *Jensen* as a “monitoring device.” Petition, 36, 37, 55.

Because *Jensen*’s device only monitors the patient and does not transmit electrical signals to the patient, a POSA would not have been motivated to limit current from *Jensen*’s device to the patient. Ex. 2014, ¶[0145]. For the same reason, a POSA would not have seen any benefit from the Petition’s incorporation of *Kroll*’s lead strips into *Jensen*. Ex. 2014, ¶[0145]. Thus, the Petition fails to establish a motivation to combine *Jensen* and *Kroll* based on a desire to “protect the patient from shock due to electricity from the device.” Petition, 35-36; Ex. 2014, ¶[0146].

ii. Kroll’s resistive traces would not protect *Jensen*’s electronics

A POSA would not have been motivated to incorporate *Kroll*’s resistive traces, which are designed “to **protect a patient** from shock,” into *Jensen*’s device to “protect sensitive electronics.” Ex. 2014, ¶[0147]; Petition, 35-36; Ex. 1013, 5:8-13. A POSA would have understood that the design of the resistors corresponds to the function. Ex. 2014, ¶[0146]. And the Petition’s confusing, layered citations do not outweigh the technical analysis of Dr. Anthony.

- (a) *Kroll's* lead strips are designed to protect the patient, which aligns with *Kroll's* goal of patient safety

Kroll's leads strips are designed “to ***protect a patient*** from shock” rather than “protect sensitive electronics.” Ex. 2014, ¶[0148]; Petition, 17-18; Ex. 1013, 5:8-13. This disclosure, which the Petition identifies (Petition, 29-30), aligns with *Kroll's* consistent goal of patient safety. Ex. 2014, ¶[0148].

Kroll provides a therapeutic electrode belt “for receiving and transmitting electric current and voltage.” Ex. 2014, ¶[0149]; Ex. 1013, 2:41-47. To safely administer such therapy, *Kroll's* device includes several features for patient protection. Ex. 2014, ¶[0149]. These features include *Kroll's* lead strips which “serve[] as a current limiter to protect a patient from shock due to malfunction of the device 20 or of a complementary medical device.” Ex. 2014, ¶[0149]; Ex. 1013, 5:8-13. The lead strips further *Kroll's* goal of patient safety.

Moreover, *Kroll's* device transmits current “to specific anatomical locations” of the patient. Ex. 2014, ¶[0150]; Ex. 1013, 1:27-36. This is important because, without delivering the shock to a precise location, the therapeutic effects would not be achieved and delivering a shock to an unintended location may injure the patient. Ex. 2014, ¶[0150]. To ensure delivery to the correct location, *Kroll* provides (1) several electrodes, all of which can transmit and receive electrical signals, and (2)

extendable side members 22. Ex. 2014, ¶[0151]; Ex. 1013, 4:37-47, 5:1-4. The side members extend from the electrode belt's main body for placement outside of the precordial region. Ex. 2014, ¶[0151]; Ex. 1013, 4:37-47, Figure 4A. Like *Kroll's* lead strips, the number, location, and adjustability of *Kroll's* electrodes all further its goal of ensuring patient safety during therapy. Ex. 2014, ¶[0151].

Finally, *Kroll* details the integrated layers of belt, which include a “shielding layer” to prevent outside electrical interference, including “interference from the device 10 with other medical diagnostic and therapeutic devices.” Ex. 2014, ¶[0152]; Ex. 1013, 6:17-24. In other embodiments, the belt may include additional shielding layers “to further shield the device from interference.” Ex. 2014, ¶[0152]; Ex. 1013, 6:17-24. These safety considerations are also shown in the design of the shielding layer itself. Namely, “[t]he shielding layer 46 is preferably recessed inwardly at its outer boundaries to minimize the risk of electrical shorting and patient shock in the event of device 10 failure.” Ex. 1013, 7:3-13. Reading this disclosure, a POSA would have understood that *Kroll*, as a therapeutic device designed to shock a patient, is particularly concerned with protecting the patient. Ex. 2014, ¶[0152]. *Jensen's* device only monitors ECG signals and does not have these same safety concerns as in *Kroll*. Ex. 2014, ¶[0152].

(b) The Petition fails to establish that *Kroll's* lead strips would protect *Jensen's* electronics

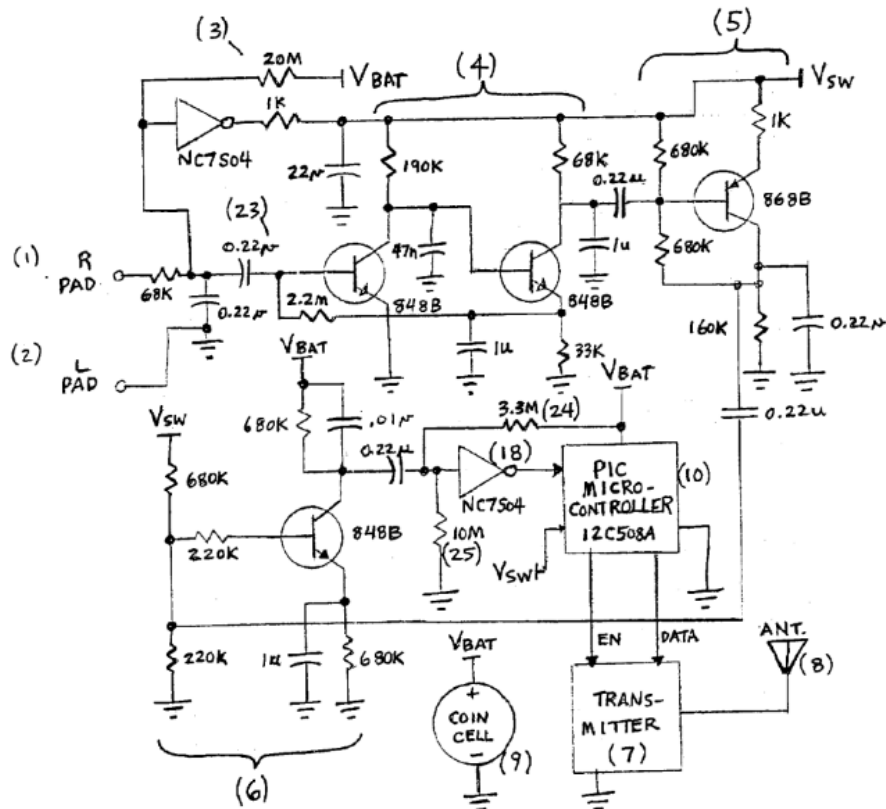
To the extent that *Kroll's* lead strips are used in *Jensen's* device, the Petition fails to establish that *Kroll's* lead strips would protect *Jensen's* electronics. Ex. 2014, ¶[0153]. The Petition highlights this failure, stating that the combination would use “the resistive leads strips of Kroll...instead of [*Jensen's*] conventional resistors.” Petition, 18. This would do nothing to protect *Jensen's* electronics.

As the Petition identifies, *Jensen's* electronics circuit provides several resistors, including gain setting resistors, feedback resistors, and resistors for signal biasing. Ex. 2014, ¶[0156]; Ex. 1011, ¶¶[0032], [0036], [0049]. Replacing *Jensen's* “conventional” resistors with *Kroll's* lead strips formed with ink deposits does ***nothing*** to change the function of these resistors. Ex. 2014, ¶¶[0154]-[0156]. In other words, the gain setting resistor would still have the same resistance, with the same placement on the circuit, and still function as a gain setting resistor. Ex. 2014, ¶[0157]. The same is true for both the feedback resistors and the resistors for signal biasing. Ex. 2014, ¶[0157]. Here, the Petition and Dr. Heikenfeld conflate the resistor's ***form*** with its ***function***. Ex. 2014, ¶¶[0158]-[0159].

Moreover, the Petition's own arguments highlight this issue. The Petition contends that *Kroll's* lead strips would protect *Jensen's* electronics simply because resistors limit current flow in both directions. Petition, 29-30; Ex. 1009, ¶277.

Applying this same blanket conclusion—that does not consider a single variable of the resistors—*Jensen*'s conventional resistors, as resistors, limit current flow in both directions and thus would protect *Jensen*'s electronics. Ex. 2014, ¶[0158]. But they do not. Ex. 2014, ¶[0160]. *Jensen*'s resistors are specifically designed as part of the electronics circuit to correspond to their function. Ex. 2014, ¶[0160].

Jensen provides example embodiments of its electronics circuit. Ex. 2014, ¶[0161]; Ex. 1011 ¶[0036]. Figure 2 includes resistors 24, 25 for signal biasing while resistors 20, 21 in Figure 3 function as gain setting resistors. Ex. 2014, ¶[0161], Ex. 1011 ¶¶[0032], [0036], Figure 2, Figure 3. A POSA would have readily understood that these resistors are specifically designed and located on *Jensen*'s electronics circuit to achieve their function. Ex. 2014, ¶[0162].



Ex. 1011, Figure 2

The Petition does not explain how *Kroll's* lead strips would protect *Jensen's* electronics. Instead, the Petition oversimplifies its combination, overlooking how a POSA would have understood the design and use of resistors in an electronics circuit. Ex. 2014, ¶[0163]. In sum, the Petition fails to establish that *Kroll's* lead strips would protect *Jensen's* electronics, and thus a POSA would not have been motivated to combine *Kroll* and *Jensen* as the Petition contends.

(c) The Petition’s nested citations fail to overcome Dr. Anthony’s analysis

The Petition’s nested citations do not outweigh Dr. Anthony’s analysis. To conclude that *Kroll*’s resistive strips would protect the electronics, the Petition cites Dr. Heikenfeld. Petition, 35-36 (citing Ex. 1009, ¶¶211-214). But Dr. Heikenfeld repeats the same conclusion, stating that resistive materials “would function to limit current in either direction...and thus would protect both the patient and the device.” Ex. 1009, ¶211 (citing Section IV.F). Turning to Dr. Heikenfeld’s citation, he concludes that “**any approach** to limiting current using resistive material to protect the patient from shock would also protect the body-worn device from excess electrical current.” Ex. 1009, ¶47 (citing Ex. 1043 at 816-17).

In other words, at the center of the Petition’s layered citations is the position that *Kroll*’s traces would protect *Jensen*’s electronics because resistors limit flow in both directions. *Id.* As Dr. Anthony’s analysis makes clear, resistors are designed corresponding to their function. Ex. 2014, ¶¶[0157]-[0158]. And Dr. Heikenfeld is wrong; it is not true that “any resistor...would protect the body-worn device from excess electrical current.” Ex. 2014, ¶[0156]; Ex. 1009, ¶47. This issue is worsened by Dr. Heikenfeld’s citation to Exhibit 1043, which is a 2019 reference that was published **thirteen years** after the priority date of the ’492 Patent. Ex. 1009, ¶47 (citing Ex. 1043 at 816-17). In view of Dr. Anthony’s analysis and the Petition’s

unsupported conclusions, a POSA would not have been motivated to incorporate *Kroll's* patient-protective resistors to protect the electronics in *Jensen's* device. Ex. 2014, ¶[0163].

- b. A POSA would not have been motivated to combine *Jensen* and *Kroll* to address size concerns

A POSA would not have been motivated to replace *Jensen's* resistors with *Kroll's* lead strips based on size concerns. Petition, 36. First, *Jensen* achieves its desired size, and the Petition does not identify any disclosure for its position that the size of *Jensen's* device is an issue or that *Jensen* intends to further limit the size. Ex. 2014, ¶¶[0164]-[0165]. Second, *Kroll* provides a therapeutic device that wraps around the patient's body; a POSA would not have looked to this device, let alone combined it with *Jensen*, to make *Jensen's* device smaller. Ex. 2014, ¶[0165].

- i. *Jensen's* design already addresses its size concerns with conventional resistors

A POSA would not have been motivated to replace *Jensen's* resistors to reduce the size of *Jensen's* device because *Jensen* already achieves this goal. Ex. 2014, ¶[0166]; Petition, 36. *Jensen's* “novelty include[s] its physical construction.” Ex. 1011, ¶[0030]. As the Petition acknowledges, *Jensen* provides “a totally self-contained sensor that is thin, being less than 6 or 7 mm in thickness, [and] low in mass.” Ex. 1011, ¶[0030]. *Jensen* achieves its goals concerning its physical

dimensions with several resistors, including gain setting resistors, feedback resistors, resistors for signal biasing. Ex. 2014, ¶[0166]; Ex. 1011, ¶¶[0032], [0036], [0049].

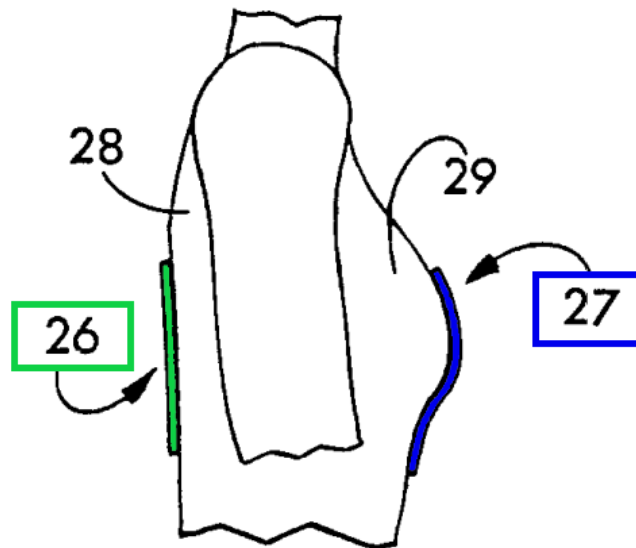
Neither the Petition nor Dr. Heikenfeld provide a single citation to establish that the size of *Jensen*'s device is an issue, or that *Jensen* intends to further limit the size of its device. Ex. 2014, ¶[0167]. This is because *Jensen* achieves its desired physical dimensions. Ex. 2014, ¶[0167]; Ex. 1011, ¶[0030]. The Petition manufactures *Jensen*'s need for a smaller device as a motivation to replace *Jensen*'s conventional resistors with *Kroll*'s lead strips. This shows that the Petition uses Claim 1 of the '492 Patent as a roadmap to create its combination. A POSA would not have been motivated to replace *Jensen*'s resistors with *Kroll*'s lead strips to further a goal that *Jensen* already achieves. Ex. 2014, ¶[0168].

- ii. *Kroll*'s device is designed to wrap around a patient, confirming the Petition's hindsight-driven approach

Kroll's device wraps around the patient's body to administer therapeutic shocks. Ex. 2014, ¶[0170]. The Petition ignores this disclosure to argue that a POSA, motivated to make *Jensen*'s device smaller, would look to *Kroll*'s much larger device. Petition, 36.

Specifically, *Kroll* provides an "electrode belt...for receiving and transmitting electric current or voltage for use on the body of a patient." Ex. 2014, ¶[0170]; Ex. 1013, Abstract. Such electrical current may be transmitted "to specific anatomical

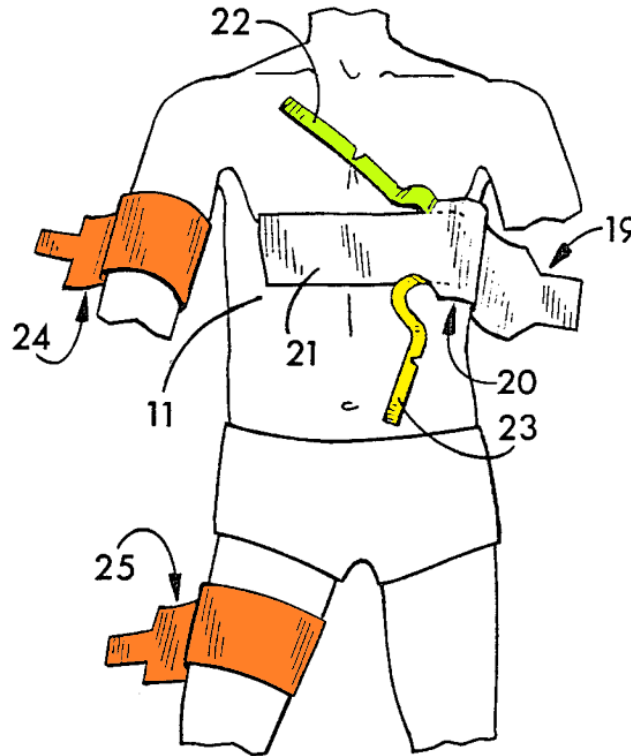
locations for therapeutic purposes.” Ex. 1013, 1:27-36. In one example, *Kroll’s* electrode belt is placed on the patient’s chest and back. Ex. 1013, 4:44-47, Figure 3 (indicating the chest portion in blue and the back portion in green). With this placement, electrical current can travel through the chest to the back to target specific areas for therapy. Ex. 2014, ¶[0171]; Ex. 1013, 4:44-47, Figure 3.



Ex. 1013, Figure 3 (annotated); Ex. 2014, ¶[0171].

In another embodiment, the electrode belt includes extendable side members that extend from the electrode belt’s main body for placement outside of the precordial region. Ex. 2014, ¶[0172]; Ex. 1013, 4:37-47, Figure 2 (indicating the side members in yellow). *Kroll’s* electrode belt may also be placed around the

patient's limbs. Ex. 2014, ¶[0172]; Ex. 1013, 4:37-47, Figure 2 (indicating the embodiments placed around the limbs in orange).



Ex. 1013, Figure 3 (annotated); Ex. 2014, ¶[0172].

Contrary to the Petition's arguments, a POSA would not have looked to any embodiments of *Kroll's* therapeutic electrode belt to "reduce the overall size of Jensen's monitoring device." Ex. 2014, ¶[0173]; Petition, 36. This is especially true for *Kroll's* lead strips. Ex. 2014, ¶[0174]; Petition, 36 (arguing that a POSA would use *Kroll's* lead strips to reduce the size of *Jensen's* device). *Kroll's* lead strips are used on the "extendable side members," which are specifically designed to make the

electrode belt larger. Ex. 2014, ¶[0174]; Ex. 1013, 4:37-47. The extendable side members are used for placement outside of the precordial region. Ex. 2014, ¶[0173]; Ex. 1013, 4:37-47. Thus, a POSA would not have been motivated to make *Jensen* smaller by replacing *Jensen*'s resistors with *Kroll*'s traces. Ex. 2014, ¶[0174].

C. Ground 3 Fails to Render Obvious the Challenged Claims

The combination of *Jensen*, *Matsumura*, *Kroll*, and “general knowledge” fails to teach or suggest several elements of Claim 7. These include (1) the reusable communication module, (2) the disposable electrode portion, (3) the electrical traces, and (4) the “releasably attached” requirement of the communication module.

Further, waterproofing is not a sufficient motivation because *Jensen*'s electronics are already sealed in its housing. And regarding “thorough cleaning,” this motivation is quickly undermined because the Petition's proposed modification to *Jensen* would not actually provide any advantages in the cleaning process.

The Petition fails to establish a motivation to combine in Ground 3.

i. The Non-Obvious Combination of *Jensen*, *Matsumura*, *Kroll*, and General Knowledge Fails to Render Obvious Claim 7

First, the combination fails to render obvious a reusable communication module. To teach this element, the Petition relies on *Jensen*'s transmitter. Petition, 55. *Jensen*, however, is silent as to whether its transmitter is reusable, and the Petition provides no reason why a POSA “would understand” that it is reusable.

Second, the combination fails to render obvious the disposable electrode portion. While *Jensen* explicitly identifies several disposable components, *Jensen* **does not** provide a disposable electrode portion. The Petition relies on “General Knowledge” for its modifications, which redesigns *Jensen*’s device to reconstruct Claim 7. But a POSA would not have been motivated to make such modifications.

Third, the Petition repeats the same flaw as it does in Ground 2. *Jensen*’s wiring does not render obvious the claimed electrical traces because *Jensen*’s wiring is not “defined between the at least two electrodes and a connection pad.” Ex. 1003, Cl. 7. Any implicit construction by the Petition should be ignored because it is improperly broad and does not consider the disclosure of the ’492 Patent.

- a. *Jensen*’s transmitter is not reusable, and the Petition provides no support to the contrary

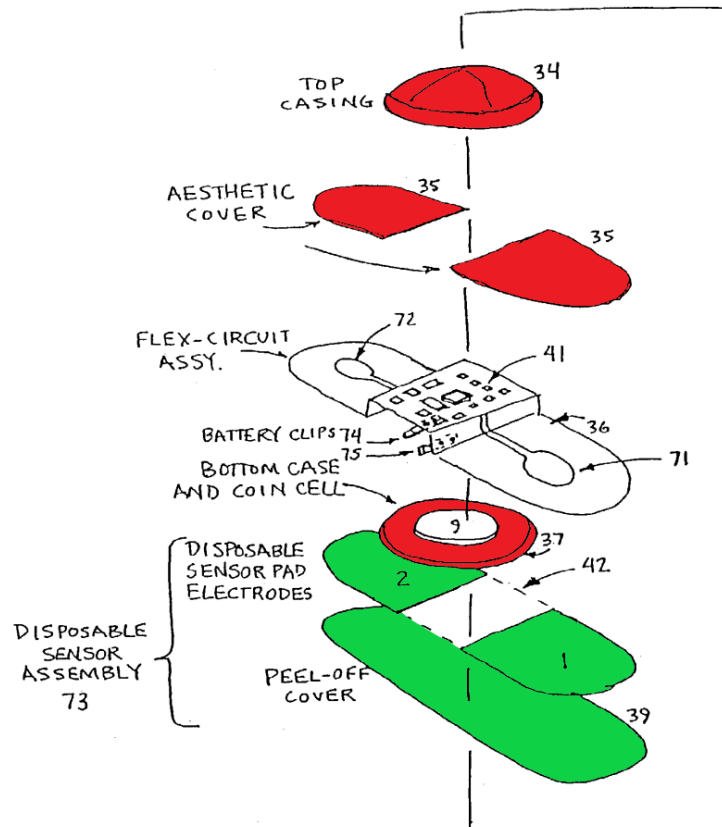
Jensen is silent as to whether its transmitter is reusable. Ex. 2014, ¶¶[0189]-[0190]; Petition, 55 (identifying *Jensen*’s transmitter as the communication module). The Petition attempts to hide this gap and cherry-picks the word “re-usable” to conclude that a POSA “would understand” that the transmitter is located on the reusable portion. Petition, 55. But *Jensen*’s disclosure is clear.

Jensen’s reusable portion is “comprised of bottom case 37, top casing 34 and two aesthetic covers 35.” Ex. 2014, ¶[0190]; Ex. 1011, ¶[0042], Figure 5 (identifying the “re-useable” components of *Jensen* in red).

Jensen's only disclosure regarding reusable components *excludes* the transmitter. Rather than directly address *Jensen's* disclosure, the Petition deceptively cites to *Jensen* as if its “re-useable” portion included the transmitter. Moreover, the Petition provides no explanation as to why the transmitter is reusable. Therefore, the Petition suffers from a failure of proof. Ex. 2014, ¶[0193].

- b. *Jensen* does not render obvious a disposable electrode portion having a flexible printed circuit layer

Jensen does not disclose a disposable electrode portion having a flexible printed circuit layer. Ex. 2014, ¶¶[0194]-[0195]; Petition, 56-57. The only disposable portion of *Jensen* is the “disposable sensor assembly,” which includes disposable sensor pad electrodes and a peel-off cover, which are shown below as green components in Figure 5. Ex. 1011, ¶¶[0041]-[0042], Figure 5.



Ex. 1011, Figure 5 (annotated); Ex. 2014, ¶[0195].

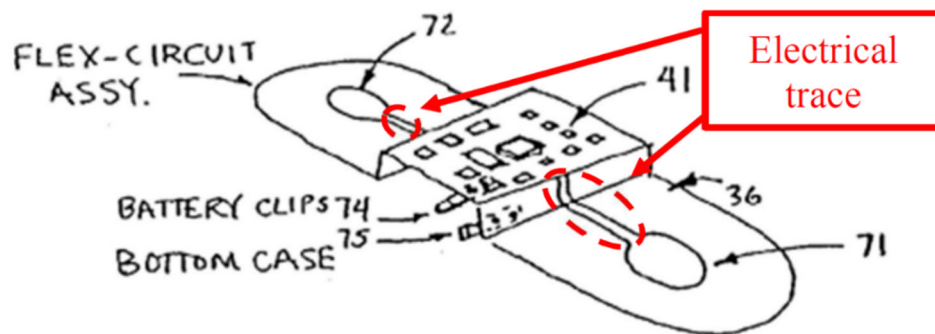
Besides these two components—neither of which are a disposable electrode portion—*Jensen* does not disclose or suggest that any components are disposable. Ex. 2014, ¶[0196]. The Petition fails to identify (nor can it) a disposable electrode portion having a printed circuit layer. Instead, the portions of *Jensen* that the Petition relies on for these elements are all disposed on a non-disposable layer.

To reconstruct Claim 7, the Petition relies on the general knowledge of a POSA to support major structural changes to *Jensen's* device. Petition, 56-57. Contrary to these arguments, a POSA would not have been motivated to completely

redesign *Jensen's* structure and move (1) the flexible circuit assembly, (2) the electrical traces, and (3) the sensor contacts to the disposable sensor assembly. Ex. 2014, ¶[0197]; Petition, 56. For the reasons discussed below, a POSA would not have been motivated to make this combination, and the Petition cannot render claim element 7[c] obvious. Ex. 2014, ¶[0197].

c. *Jensen's* Wiring Is Not Defined Between a Connection Pad and a Conductive Surface

Finally, the Petition repeats the same flaw as in Claim 1. As addressed in Section VI.B.i.a, *Jensen's* wiring does not extend from the electrode sensor pads to the connection pad. Ex. 2014, ¶[0198]. For the same reasons, *Jensen's* wiring is not “defined between” the electrodes and the connection pad. Ex. 2014, ¶[0199]. Again, the Petition annotates Figure 5, which confirms this conclusion. Ex. 2014, ¶[0200]; Petition, 58-59 (annotating Figure 5, reproduced below).



Ex. 1001, Figure 5 (Petition’s original annotations).

Jensen's wiring extends from sensor pads 71, 72 to the electronics circuit 41 but does not extend to contact pad 48. Ex. 2014, ¶[0200]; Petition, 58-59; Ex. 1011, Figure 5. In Figure 8, which is the only embodiment in *Jensen* with contact pad 48, pads 48 have nothing to do with the wiring. Ex. 1011, ¶[0046]; Ex. 2014, ¶[0201]. The wiring is not defined between the pads to the sensor. Ex. 2014, ¶[0201].

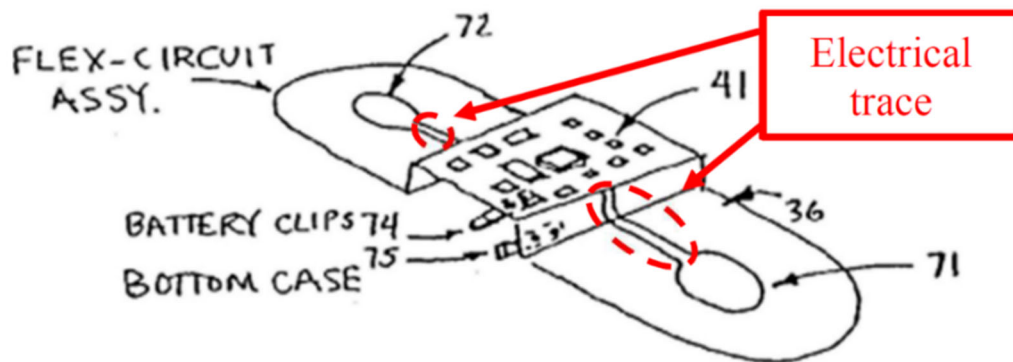
Jensen's disclosure presents the same issues to the Petition as in Claim 1: (1) *Jensen* provides zero disclosure that is wiring is defined between the connection pad and the sensor pads (*i.e.*, it does not extend between sensor pad 71 and pad 48); and (2) *Jensen* only relevant disclosure shows the opposite—its wiring is not defined between the pads to the sensor. Petition, 58-59. The Petition's bare conclusion that a "POSA would understand" that the wiring to match the claims does not satisfy its burden. Accordingly, the Petition fails to render claim element 7[e] obvious.

i. Any Implicit Claim Construction by the Petition is Improper and Should be Ignored

The Petition did not apply the *Phillips* analysis as to "defined between." Petition, 2. And even if considered, the Petition's construction of "defined between" fails on the merits because the construction is unreasonably broad and does not fall within the meaning of "defined between" in Claim 7.

ii. The Petition Did Not Provide a Construction under the Legally Proper *Phillips* Framework

Like “extending between” in Claim 1, the Petition also applies the “ordinary and customary meaning” for “defined between.” Petition, 2. Under the ordinary and customary meaning, the Petition appears to “defined between” as electrically coupled, without requiring the trace to directly defined between the connection pad and the conductive surface. Ex. 2014, ¶[0202]; Petition, 40-41 (annotating Figure 5). The Petition’s application of this broad construction without applying the *Phillips* framework is improper attempt and should be ignored.

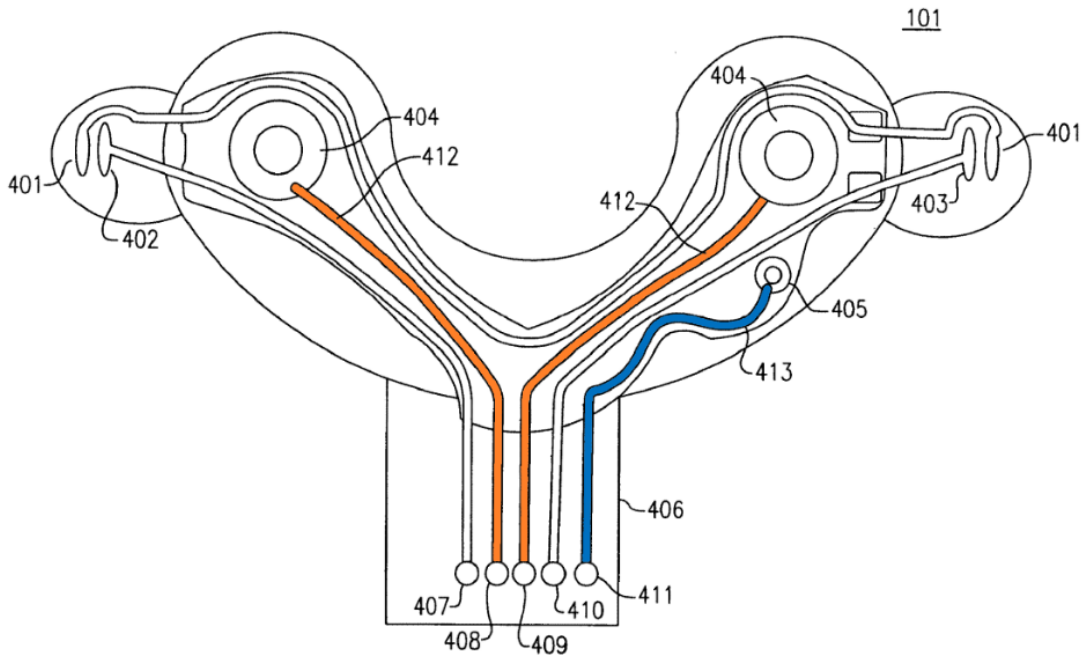


Ex. 1011, Figure 5 (Petition’s original annotations).

iii. The Petition’s Construction of Defined Between Ignores Disclosure of the ’492 Patent

The ’492 Patent explains that “[t]races 412 *extend[] between* conductive surface 404 and connection pads 408 and 409.” Ex. 1004, 7:50-55. These traces (orange) are shown below in Figure 4A. Ex. 1004, 7:50-55, Figure 4A (annotated).

This description matches the language in Claim 7, which requires electrical traces defined between *at least two* electrodes and a connection pad. Ex. 1004, Cl. 7.



Ex. 1004, Figure 4A (annotated); Ex. 2014, ¶[0046].

These examples, which the Petition’s ignores, show that the ’492 Patent uses “defined between” as defined directly between two components. Ex. 1004, 7:50-55, Figure 4A (annotated); Ex. 2014, ¶¶[0203]-[0204]. Therefore, any improperly broad construction of “defined between” relied on by the Petition fails.

- d. The Petition's combination does not render obvious a communication module that is releasably attached to a disposable electrode portion

Jensen does not disclose a releasable attachment (nor does the Petition contend as such), and the combination with *Matsumura* fails to remedy this deficiency. The Petition does not provide any legal support for its theory.

Specifically, *Matsumura*'s hooks and the claimed "latching clip" being "just well-known methods of attaching items" does not render this element obvious. Petition, 61. Regardless of whether *Matsumura*'s hooks or the claimed "latching clip" are well-known attachment methods, the Petition provides no explanation as to *why* a POSA would have been motivated to use the claimed latching clips. For this reason alone, the Petition fails to render obvious the communication module that is "releasably attached" to the disposable electrode portion.

ii. The Petition Fails to Establish a Motivation to Combine *Jensen* and *Matsumura*

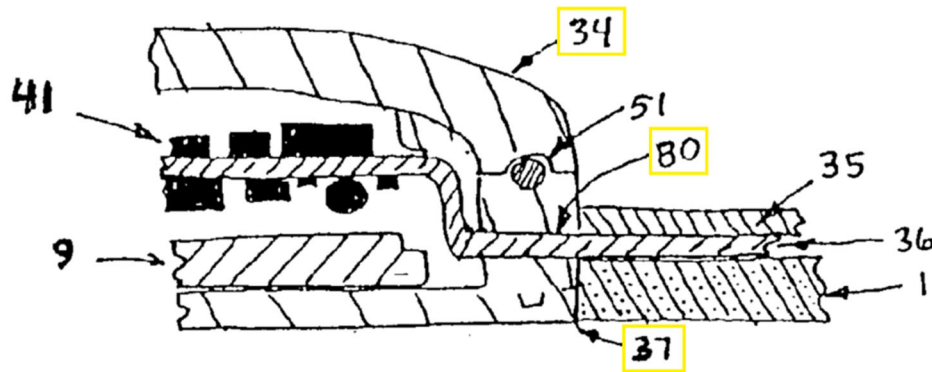
The Petition fails to establish that a POSA would have been motivated to modify *Jensen* based on either a desire to achieve a waterproof structure or the risk of ineffective cleaning. Ex. 2014, ¶[0206]; Petition, 49-54. First, waterproofing is not a sufficient motivation to combine because *Jensen*'s electronics are already sealed from the surrounding environment. Ex. 1011, ¶[0045]; Ex. 2014, ¶[0207]. Second, "ineffective cleaning" would not have motivated a POSA to modify *Jensen*

because the proposed modification to *Jensen* would not actually provide any benefit in the cleaning process over what is already present. Ex. 2014, ¶[0211].

Accordingly, a POSA would not have been motivated to combine *Jensen* and *Matsumura*, and Ground 3 fails.

a. A POSA Would Not Have Been Motivated to Modify *Jensen* to Achieve a Waterproof Structure

Jensen already seals its electronics from the surrounding environment. Ex. 1011, ¶[0045]; Ex. 2014, ¶[0207]; Petition, 52. In Figure 7, *Jensen* provides top case 34 that mounts to bottom case 37, which includes slot cut-out 80 for the passage of flexible circuit assembly 36. Ex. 1011, ¶[0045]; Ex. 2014, ¶[0208].



Ex. 1011, Figure 7 (annotated); Ex. 2014, ¶[0207].

Once assembled, a sealant is applied to the slot 80 “to *seal the electronics* 41 from the surrounding environment.” Ex. 1011, ¶[0045]; Ex. 2014, ¶[0208]. Also, the “top and bottom case halves 34, 37 have an o-ring seal 51 at their mating surfaces.” Ex. 1011, ¶[0045]; Ex. 2014, ¶[0208]. Based on this disclosure, a POSA

would not have been motivated to look to other references to modify *Jensen*, let alone redesign *Jensen* as the Petition suggests. Ex. 2014, ¶[0208].

Moreover, the Petition is not saved by its unsupported conclusion that *Jensen*'s design is "susceptible to seepage." Ex. 2014, ¶[0209]; Petition, 52. Neither *Jensen* nor *Matsumura* provide any disclosure that suggest *Jensen*'s structure is not sufficiently sealed. *See generally* Ex. 1011; Ex. 1012. As a common theme, the Petition relies on the general knowledge to fill gaps—without pointing to *any* disclosure, anywhere. Petition, 52. In Dr. Heikenfeld's declaration, he too concludes, without support, that a POSA would have known that *Jensen* was prone to seepage. Ex. 2014, ¶[0209]; Ex. 1009, ¶943. But Dr. Heikenfeld confirms that *Jensen* already addresses the problem through its sealant. *Id.* This already solved problem fails to provide a motivation to combine *Jensen* and *Matsumura*. Contrary to the Petition, a POSA would not been motivated to make modify *Jensen* to achieve a "waterproof" structure. Ex. 2014, ¶[0210].

b. A POSA Would Not Have Been Motivated to Modify *Jensen* Due to "Ineffective Cleaning"

In Figure 5, for example, disposable sensor pad electrodes 1, 2 couple to the flexible circuit assembly, which includes electronics circuit 41. Ex. 1011, ¶¶[0041]-[0042], Figure 5; Ex. 2014, ¶[0212]. The Petition contends that a POSA would modify *Jensen* to include a disposable layer that (1) connects the electrodes to the

electronics while (2) separating the reusable portion from the skin. Petition, 51-52. The Petition does nothing but state a result to reconstruct the Challenged Claims. The Petition also fails because its motivation is based on the false premise that its modifications would lead to disposable parts for minimizing the risk of ineffective cleaning. Ex. 2014, ¶¶[0211], [0213]; Petition, 49.

Jensen's circuits are “**heat re-flowed together**, melting the tinning metal, to connect the two circuits.” Ex. 1011, ¶[0046], Figure 8A; Ex. 2014, ¶[0214]. A POSA would have understood that heat reflow is a form of permanent bond, like a weld. Ex. 2014, ¶[0214]. The Petition concludes that a POSA would modify *Jensen* to include a disposable layer but does not explain why a POSA would make this change or how, given the permanent nature of the bond between the two circuits. Ex. 2014, ¶[0215]. The Petition’s does not address this disclosure.

Further, a POSA would not make circuit 50 disposable in view of *Jensen's* disclosure. Ex. 2014, ¶[0216]. A POSA would have recognized that there would be no advantages in making circuit 50 disposable when it is fixed to reusable circuit 49. Ex. 2014, ¶[0216]. Rather, separating circuits 49, 50 would damage (if not destroy) *Jensen's* device when a lab technician would try to dispose of the “disposable” circuit 50. Ex. 2014, ¶[0216]. If this modification was made, *Jensen's* device would include one “disposable” circuit 50 that could not be detached (and

thus not disposable) from *Jensen*'s other circuit 49. Ex. 2014, ¶[0216]. This would eliminate the “disposable” nature. Therefore, “ineffective cleaning” would not have motivated a POSA to modify *Jensen* as the Petition contends. Ex. 2014, ¶[0217].⁶

VII. CONCLUSION

As each of the Grounds fail, the Petition should be denied.

⁶ For the same reasons in Section VI.B.ii, Ground 3 also fails to establish a motivation to combine *Jensen* and *Kroll*.

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Certification of Word Count Under 37 C.F.R. § 42.24(d)

The undersigned hereby certifies that the foregoing contains 13,885 words according to the word count of the word-processing software used to prepare the foregoing and accounting for the words in the figures as required by the Trial Practice Guide.

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