

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,
Petitioner,

v.

LOGANTREE, LP,
Patent Owner.

IPR2022-00040
Patent 6,059,576 C1

Before PATRICK R. SCANLON, MITCHELL G. WEATHERLY, and
JAMES A. WORTH, *Administrative Patent Judges*.

SCANLON, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

Apple Inc. (“Petitioner”) challenges claims 1–5, 8–11, 20, 25, 30–32, 36, 39–42, 45–51, 61–65, 144, and 147 of U.S. Patent No. 6,059,576 C1 (Ex. 1001, “the ’576 patent”), which is assigned to LoganTree, LP (“Patent Owner”). We have jurisdiction under 35 U.S.C. § 6, and this Final Written Decision is issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons that follow, we determine that Petitioner has shown by a preponderance of the evidence that claims 1–5, 8–11, 20, 25, 30–32, 36, 39–42, 45–51, 61–65, 144, and 147 of the ’576 patent are unpatentable.

A. Procedural History

Petitioner filed a Petition (Paper 3, “Pet.”) requesting an *inter partes* review of the challenged claims. Patent Owner did not file a Preliminary Response.

We instituted a trial as to all challenged claims. Paper 10 (“Decision on Institution” or “Dec. Inst.”).

After institution, Patent Owner filed a Patent Owner Response (Paper 17, “PO Resp.”), Petitioner filed a Reply (Paper 21, “Reply”), and Patent Owner filed a Sur-reply (Paper 22, “Sur-reply”).

Petitioner relies on the Declaration of Dr. Thomas W. Kenny (Ex. 1003) in support of its contentions. Patent Owner relies on the Declaration of Vijay K. Madisetti (Ex. 2005) in support of its contentions.¹

¹ When citing to Dr. Madisetti’s declaration in the Patent Owner Response, Patent Owner identifies it as Exhibit 2001 instead of Exhibit 2005. Patent Owner explains that this discrepancy was due to a filing error and confirms that Dr. Madisetti’s declaration is Exhibit 2005. Sur-reply 19–20. Accordingly, we change any of Patent Owner’s citations to Dr. Madisetti’s declaration to Exhibit 2005 in this Decision.

An oral hearing was held on June 2, 2023. A transcript of the hearing is included in the record. Paper 28 (“Tr.”).

B. Real Parties in Interest

Petitioner identifies itself as the real party in interest. Pet. 94. Patent Owner identifies itself as the real party in interest. Paper 8, 1.

C. Related Matters

The parties identify the following proceedings as related matters involving the ’576 patent: *LoganTree LP v. Apple, Inc.*, Case No. 6:21-cv-00397 (W.D. Tex.);² *LoganTree LP v. LG Electronics, Inc.*, Case No. 4:21-cv-00332 (E.D. Tex.); *LoganTree LP v. Huawei Technologies USA Inc.*, Case No. 4:21-cv-00119 (E.D. Tex.); and *LoganTree LP v. Fossil Group*, Case No. 1:21-cv-00385 (D. Del.). Pet. 94 (citing Exs. 1031–1037); Paper 8, 2.

In addition, Petitioner states that it has filed another petition for *inter partes* review of the ’576 patent, IPR2022-00037.³ Pet. 94–95. Petitioner states that two other *inter partes* review proceedings challenging the ’576 patent (IPR2017-00256 and IPR2017-00258) terminated after the filing of a petition but before any decision on institution, and final written decisions were entered in two more *inter partes* review proceedings challenging the ’576 patent (IPR2018-00564 and IPR2018-00565). *Id.* at 95. Patent Owner also identifies these proceedings. Paper 8, 3.

² This proceeding was transferred from the Western District of Texas to the Northern District of California on May 16, 2022, and is now styled *LoganTree LP v. Apple, Inc.*, Case No. 5:22-cv-02892 (N.D. Cal.). Paper 6, 2.

³ The Board instituted a trial in this proceeding on September 1, 2022. IPR2022-00037, Paper 10.

*D. The '576 Patent*⁴

The '576 patent is titled “Training and Safety Device, System and Method to Aid in Proper Movement During Physical Activity” and relates to “the field of electronic training and safety devices used to monitor human physical activity.” Ex. 1001, code (54), 1:6–7. More specifically, the '576 patent discloses a method that detects, measures, records, and/or analyzes the time, date, and other data associated with movement of the device and produces meaningful feedback regarding the measured movement. *Id.* at 1:8–11.

The '576 patent discloses that certain prior art devices recorded the number of times that a predetermined angle was exceeded but were not convenient to operate and served to report rather than analyze the information. *Id.* at 1:45–54. The '576 patent discloses that it is also important to measure angular velocity to monitor and analyze improper movement. *Id.* at 1:55–67.

The '576 patent discloses an electronic device that tracks and monitors an individual's motion through the use of a movement sensor capable of measuring data associated with the wearer's movement. *Id.* at 2:10–13. The device of the '576 patent includes a user-programmable microprocessor, which receives, interprets, stores and responds to the movement data based on customizable operation parameters; a clock connected to the microprocessor; memory for storing the movement and analysis data; a power source; a port for downloading the data from the

⁴ An *ex parte* reexamination certificate issued on March 17, 2015, with all claims either amended from their original form or newly added during reexamination. Ex. 1001, code (45) C1, cols. 1–12 C1.

device to other computation or storage devices contained within the system; and various input and output components. *Id.* at 2:13–21.

Figure 4 of the '576 patent is a block diagram of the movement measuring device (*id.* at 3:11–12):

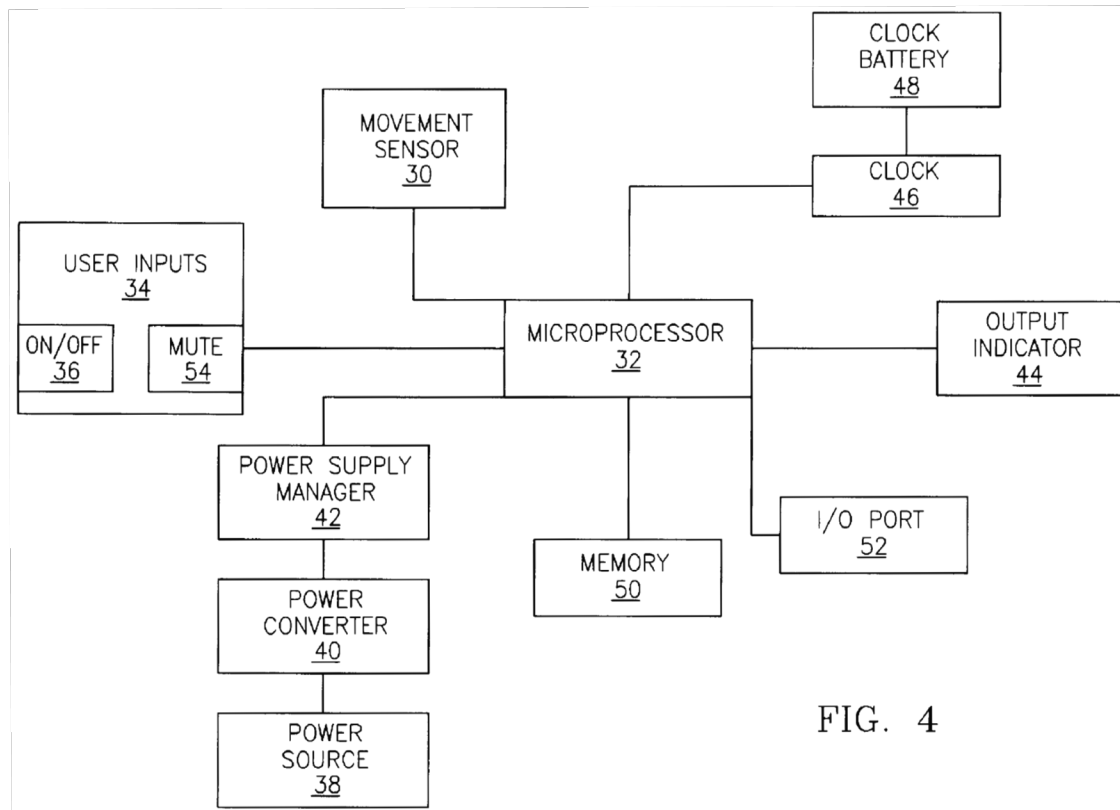


FIG. 4

Figure 4 depicts a block diagram of the components of the device.

The self-contained device can be worn at various positions along the torso or appendages being monitored depending on the specific physical task being performed. *Id.* at 2:21–24. The device also monitors the speed of the movements made while the device is being worn. *Id.* at 2:24–25. When a pre-programmed event is recognized, the device records the time and date of the event while providing feedback to the wearer via visual, audible and/or tactile warnings. *Id.* at 2:25–29. Periodically, data from the device may be downloaded into an associated computer program, which analyzes the data.

Id. at 2:29–31. The program can then format various reports to aid in recognizing and correcting trends in incorrect physical movement. *Id.* at 2:31–33.

E. Challenged Claims

As noted above, Petitioner challenges claims 1–5, 8–11, 20, 25, 30–32, 36, 39–42, 45–51, 61–65, 144, and 147. Of these claims, claims 1 and 20 are independent. Claim 1, as amended in the reexamination proceeding, is illustrative of the subject matter and is reproduced below, with bracketed numbering added to track those used in the Petition:

1. [1pre] A portable, self-contained device for monitoring movement of body parts during physical activity, said device comprising:

[1a] a movement sensor capable of measuring data associated with unrestrained movement in any direction and generating signals indicative of said movement;

[1b] a power source;

[1c] a microprocessor connected to said movement sensor and to said power source, [1d-1] said microprocessor capable of receiving, interpreting, storing and responding to said movement data based on user-defined operational parameters, [1d-2] detecting a first user-defined event based on the movement data and at least one of the user-defined operational parameters regarding the movement data, and [1d-3] storing first event information related to the detected first user-defined event along with first time stamp information reflecting a time at which the movement data causing the first user-defined event occurred;

[1e] at least one user input connected to said microprocessor for controlling the operation of said device;

[1f] a real-time clock connected to said microprocessor;

[1g] memory for storing said movement data; and

[1h] an output indicator connected to said microprocessor for signaling the occurrence of user-defined events;

[1i] wherein said movement sensor measures the angle and velocity of said movement.

Ex. 1001, 1:25–50 C1 (emphasis omitted); Pet. vi–vii.

F. Instituted Grounds of Unpatentability

We instituted *inter partes* review of the challenged claims based on the following grounds of unpatentability asserted by Petitioner:⁵

Ground	Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1	1–5, 8–11, 20, 25, 30, 36, 39–42, 45–51, 61–63, 144, 147	103(a)	Allum, ⁶ Raymond, ⁷ Conlan ⁸
1A/2	31, 32	103(a)	Allum, Raymond, Conlan, de Remer ⁹
3	64, 65	103(a)	Allum, Raymond, Conlan, Gaudet ¹⁰
4	20, 25	103(a)	Gesink, ¹¹ Raymond

Dec. Inst. 22; Pet. 1–2.

II. ANALYSIS

A. Legal Standards

To prevail in its challenge, Petitioner must demonstrate by a preponderance of the evidence that the claims are unpatentable. 35 U.S.C.

⁵ The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), amended 35 U.S.C. § 103. Because the ’576 patent has an effective filing date before the effective date of the applicable AIA amendments, we apply the pre-AIA version of 35 U.S.C. § 103.

⁶ US 5,919,149, issued July 6, 1999 (Ex. 1008).

⁷ US 5,778,882, issued July 14, 1998 (Ex. 1009).

⁸ US 5,573,013, issued Nov. 12, 1996 (Ex. 1010).

⁹ US 5,412,801, issued May 2, 1995 (Ex. 1013).

¹⁰ US 6,018,705, issued Jan. 25, 2000 (Ex. 1012).

¹¹ US 5,803,740, issued Sept. 8, 1998 (Ex. 1014).

§ 316(e); 37 C.F.R. § 42.1(d) (2020). “In an IPR, the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (2012) (requiring *inter partes* review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)). This burden of persuasion never shifts to the patent owner. *See Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (discussing the burden of proof in *inter partes* review).

A patent claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) when in evidence, objective indicia of non-obviousness (also called secondary considerations), such as commercial success, long-felt but unsolved needs, and failure of others. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). We analyze grounds based on obviousness in accordance with the above-stated principles.¹²

¹² The record does not include any evidence of objective indicia of non-obviousness.

B. Level of Ordinary Skill in the Art

In determining whether an invention would have been obvious at the time it was made, 35 U.S.C. § 103 requires us to resolve the level of ordinary skill in the pertinent art at the time of the effective filing date of the claimed invention. *Graham*, 383 U.S. at 17. The person of ordinary skill in the art is a hypothetical person who is presumed to have known the relevant art. *In re GPAC, Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995). Factors that may be considered in determining the level of ordinary skill in the art include, but are not limited to, the types of problems encountered in the art, the sophistication of the technology, and educational level of active workers in the field. *Id.* In a given case, one or more factors may predominate. *Id.*

Petitioner contends that a person having ordinary skill in the art would have had a Bachelor of Science degree in an academic discipline emphasizing the design of electrical, computer, or software technologies, in combination with training or at least one to two years of related work experience with capture and processing of data or information, including but not limited to physical activity monitoring technologies. Alternatively, the person could have also had a Master of Science degree in a relevant academic discipline with less than a year of related work experience in the same discipline.

Pet. 2–3 (citing Ex. 1003 ¶ 22–23).

Patent Owner argues that a person of ordinary skill in the art “would have had a bachelor’s degree in electrical engineering or computer engineering or equivalent, and two years of experience in embedded signal processing and/or systems, or equivalent.” PO Resp. 18 (citing Ex. 2005 ¶ 43). Patent Owner adds that “[a]dditional industry experience or technical training may offset less formal education, while advanced degrees or

additional formal education may offset lesser levels of industry experience.”
Id.

In the Decision on Institution, we adopted Petitioner’s proposed level of ordinary skill in the art, stating it was “consistent with the evidence of record, including the asserted prior art.” Dec. Inst. 8. In proposing a different level of ordinary skill in the art, Patent Owner does not explain why its proposed skill level is more appropriate.¹³ PO Resp. 18. In addition, the parties’ proposed definitions are substantially similar.

Accordingly, for the purposes of this Decision, we apply Petitioner’s definition, although our conclusions with respect to obviousness would be the same if we were to apply Patent Owner’s definition.

C. Claim Construction

In *inter partes* reviews, the Board interprets claim language using the district-court-type standard, as described in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). *See* 37 C.F.R. § 42.100(b) (2021). Under that standard, we generally give claim terms their ordinary and customary meaning, as would be understood by a person of ordinary skill in the art at the time of the invention, in light of the language of the claims, the specification, and the prosecution history. *See Phillips*, 415 F.3d at 1313–14. Although extrinsic evidence, when available, may also be useful when construing claim terms under this standard, extrinsic evidence should be considered in the context of the intrinsic evidence. *See id.* at 1317–19.

Petitioner argues that one of ordinary skill in the art would have understood that the term “a movement sensor” encompasses one or more

¹³ Petitioner does not address the level of ordinary skill in the art in its Reply.

sensors capable of detecting movement and measuring movement data associated with the detected movement. Pet. 5 (citing Ex. 1003 ¶¶ 52–53). Petitioner contends that the prosecution history of the '576 patent supports this construction. *Id.* at 19 (citing Ex. 1003 ¶ 54; Ex. 1007, 248, 250–51, 491–99).

Patent Owner disagrees, arguing that “movement sensor” is a straightforward claim term and should be given its plain and ordinary meaning. PO Resp. 18–19. Patent Owner also argues that “Petitioner has not suggested that its interpretation would resolve the question of the relevance of any of its references.” *Id.* at 19 (citing *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999); *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017)).

We determine that we need not expressly construe “movement sensor” to resolve the parties’ disputes because doing so would have no effect on the analysis below. *See Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) (“The Board is required to construe ‘only those terms that . . . are in controversy, and only to the extent necessary to resolve the controversy.’”) (quoting *Vivid Techs.*, 200 F.3d at 803 (Fed. Cir. 1999)). To the extent the parties raise claim construction issues in addressing the asserted grounds, we address such issues below.

D. Dr. Madisetti’s Testimony

Petitioner argues that Dr. Madisetti’s testimony should not be given any weight. Reply 29–30. First, Petitioner contends that the Patent Owner Response does not provide a single citation to Dr. Madisetti’s declaration, Exhibit 2005. *Id.* at 29. However, Patent Owner explains that the Patent Owner Response mistakenly cites to Exhibit 2001 instead of Exhibit 2005 due to a filing error and confirms that Dr. Madisetti’s declaration is

Exhibit 2005. Sur-reply 19–20. Accordingly, Petitioner’s argument is not persuasive.

Petitioner also argues that Dr. Madisetti’s testimony in Exhibit 2005 is not based on underlying facts because, in the 60-paragraph declaration, only paragraphs 32–35 and 59 have any citations. Reply 29. Petitioner also asserts that Dr. Madisetti refused to answer questions and provide clarification during his deposition. *Id.* at 30 (citing Ex. 1040, 30:3–20, 52:2–14, 78:16–84:4). Patent Owner states that it served a supplemental declaration in response to Petitioner’s Objection to Evidence months before the deposition of Dr. Madisetti.¹⁴ Sur-reply 20.

On this record, we decline to discount Dr. Madisetti’s testimony in its entirety as suggested by Petitioner. Instead, we consider Dr. Madisetti’s testimony, as we do all expert testimony, in accordance with governing law and Board rules.

E. Ground 1: Asserted Obviousness Based on Allum, Raymond, and Conlan

Petitioner asserts that claims 1, 3–5, 8, 10, 20, 25, 30, 39, 41, 42, and 61–65 of the ’576 patent are unpatentable under 35 U.S.C. § 103(a) based on Allum, Raymond, and Conlan. Pet. 6–63. Patent Owner provides arguments addressing this asserted ground of unpatentability. PO Resp. 20–39. We first summarize the references and then address the parties’ contentions.

1. Allum

Allum relates to “providing non-invasive testing of the postural sway of a human subject,” and more particularly to the “direct measurement of body position using displacement or motion transducers or other sensing

¹⁴ The supplemental declaration has not been made of record. Tr. 56:2–57:4.

devices attached to the body.” Ex. 1008, 1:11–16. We reproduce Figure 1 below.

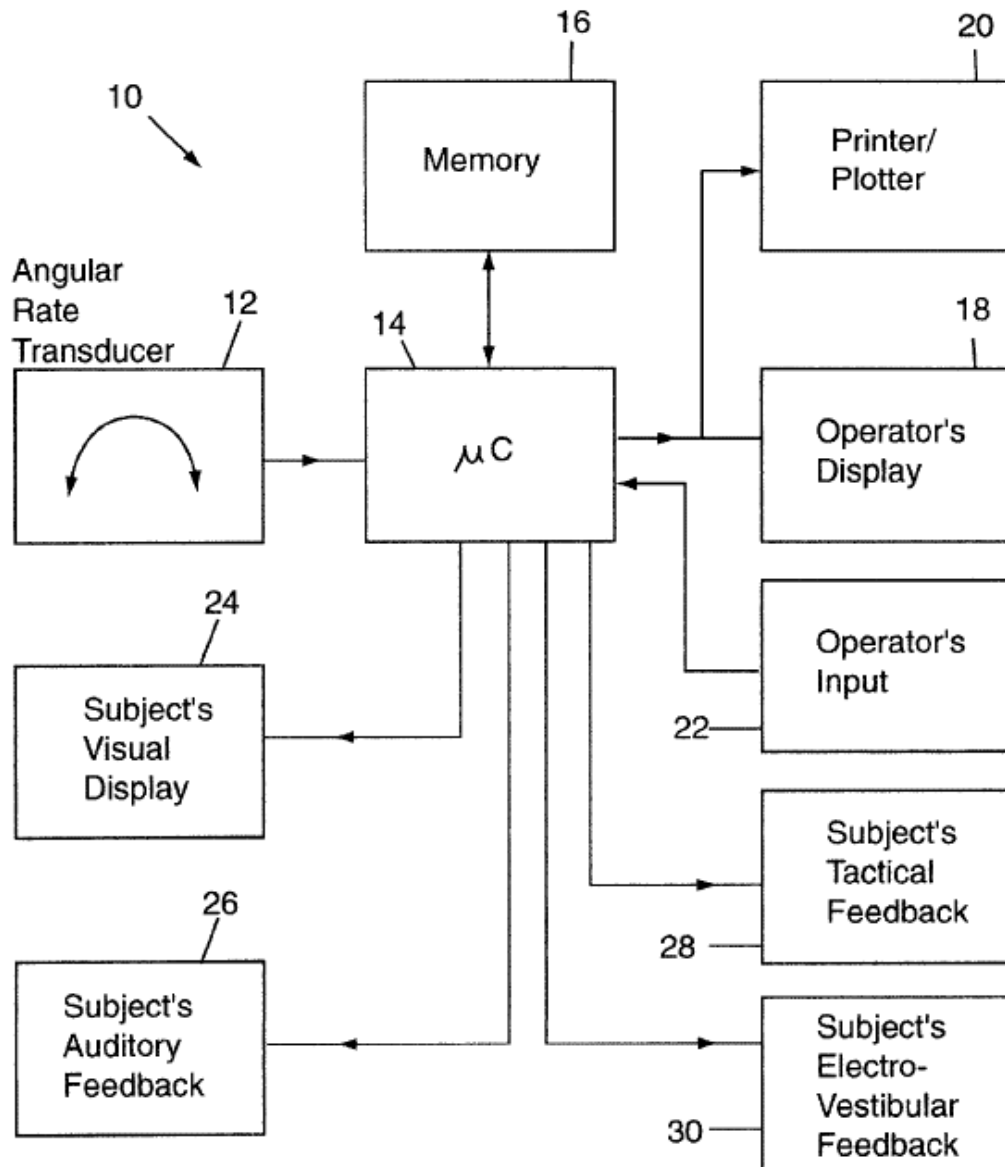


Fig. 1

Figure 1 is a block diagram of an angular position and velocity based body sway diagnosis and rehabilitation system. *Id.* at 6:29–31. The system includes body sway sensors 12 that are attached to a subject and provide body sway signals to system processor 14, which derives body sway angle

and angular velocity from the signals. *Id.* at 6:67–7:3. The system further includes memory 16, operator’s display unit 18, and operator’s input device 22. *Id.* at 7:8–13. Visual, auditory, tactile, and electro-vestibular feedback systems 24, 26, 28, 30 provide feedback on body sway angle and angular velocity information. *Id.* at 7:49–61.

Body sway sensors 12 can be attached to the chest of the subject to register the roll, or side-to-side, and pitch, or forward and backward, motion of the subject’s upper body. *Id.* at 8:29–32. A third sensor may be used to capture the yaw or turning motion of the subject. *Id.* at 8:48–51.

Allum discloses providing a warning if the subject’s angular sway has approached within a certain percentage of the angular cone of stability. *Id.* at 14:7–11. The “cone of stability” is defined as “the maximum leaning position of the upper body, i.e[.], the trunk, that a subject can achieve standing for two seconds, without falling, while attempting to keep his body as straight as possible.” *Id.* at 11:2–6.

2. *Raymond*

Raymond discloses health tracking system 100 having central database 102 connected to health trackers 104. Ex. 1009, 4:62–64. Each health tracker 104 includes multi-parametric physiological monitor 108 and data logger 106. *Id.* at 4:65–67. Monitor 108 includes a variety of sensors that detect a parameter and output signals to monitor hardware 144. *Id.* at 6:19–26. The sensors include accelerometer 134 for detecting motion and inclination of the patient’s body. *Id.* at 6:41–42. Monitor 108 also includes batteries 129. *Id.* at 6:15–18.

Monitor hardware 144 includes real time (“RT”) controller 148 that coordinates sampling of the sensor outputs, organizes the data and transmits it to memory server controller 150 for later uploading to database 102. *Id.*

at 8:32–36, Fig. 4. The system includes multiple clocks, including real time (“RT”) clock 155 that provides a “wakeup” pulse to CPU 141. 9:63–10:11.

3. *Conlan*

Conlan relates to an apparatus and methods for monitoring activity of the human body, and more particularly, methods by which the occurrence and length of certain types of body movements (which form activity phenomenon) can be selectively observed and quantified. Ex. 1010, 1:14–19. Conlan describes a problem with prior art devices, i.e., that saturation of memory occurred when the volume of data being monitored exceeded capacity, and states that this problem was aggravated because prior activity monitors were not selectively configurable to collect data only for a particular activity. *Id.* at 1:65–2:9.

Conlan discloses an activity monitor worn on the skin and preferably on a user’s non-dominant wrist. *Id.* at 2:52–59. In a preferred embodiment, activity monitor 10 includes a pair of user-input pushbuttons 22, 23. *Id.* at 6:39–40. The user can depress one of the pushbuttons upon the occurrence of dizziness or pain so that the occurrence is recorded in the internal memory of the monitor. *Id.* at 6:43–46.

4. *Independent Claim 1*

Petitioner articulates reasons that one of ordinary skill in the art allegedly would have combined the teachings Allum, Raymond, and Conlan in the manner proposed. Pet. 15–18, 21–24. Petitioner contends that the proposed combination of Allum, Raymond, and Conlan discloses the limitations of claim 1. *Id.* at 24–40. Patent Owner argues that Petitioner’s reasons for combining Allum, Raymond, and Conlan lack merit. PO Resp. 20–22. Patent Owner also argues that the proposed combination fails to satisfy limitation [1d-3]. *Id.* at 23–27.

a) The Combination of Allum, Raymond, and Conlan

Petitioner first contends that it would have been obvious to one of ordinary skill in the art “to incorporate Raymond’s power supply and RT clock into Allum’s measuring device because doing so would have merely involved combining prior art elements according to known methods to yield predictable results.” Pet. 15–16 (citing Ex. 1003 ¶ 67). In particular, Petitioner argues that, although it would have been obvious to a skilled artisan that Allum’s device would have included a power source, one of ordinary skill in the art would have added Raymond’s batteries 129 to Allum to include a power supply and support unobtrusive, low-power monitoring operation in Allum. *Id.* at 16 (citing Ex. 1003 ¶ 68; Ex. 1009, 9:38–46, 5:7–11, 6:15–18, Fig. 2). Petitioner also asserts that it would have been obvious to incorporate Raymond’s real time clock so that Allum’s device can use a clock for logging time information and synchronize each data sampling event by initiating a data collection sequence. *Id.* at 17 (citing Ex. 1008, 14:47–54, 10:10–13; Ex. 1009, 10:16–36; Ex. 1003 ¶ 70). In addition, Petitioner asserts that Raymond discloses time stamping data as it is collected and it would have been obvious to incorporate this time stamping of collected data so that the subject’s health can be tracked and assessed over time. *Id.* at 18 (citing Ex. 1008, 14:47–54, 10:10–13; Ex. 1009, 1:42–57, 2:23–30; Ex. 1003 ¶ 71).

Next, Petitioner contends that, given Conlan’s teaching of gathering additional data relating to a particular event, such as a feeling of dizziness, it would have been obvious to one of ordinary skill in the art to modify the device of the Allum-Raymond combination “to include Conlan’s buttons to enable the device to gather data (e.g., subject’s balance or movement) as it relates to a particular event specified by the user input buttons.” *Id.* at 21–22

(citing Ex. 1003 ¶ 79). Petitioner asserts that “[t]he identification of event-specific balance data would allow a clinician to better understand a subject’s balance or postural problems (e.g., by contrasting balance data related to the particular event and not related to the particular event) and use this understanding to aid in rehabilitation.” *Id.* at 22 (citing Ex. 1003 ¶ 79).

Patent Owner argues that Petitioner has failed to provide a sufficient reason for one of ordinary skill in the art to combine the references in the manner proposed.¹⁵ PO Resp. 20–21 (citing *KSR*, 550 U.S. at 421; *Micro Chemical, Inc. v. Great Plains Chemical Co.*, 103 F.3d 1538, 1546 (Fed. Cir. 1997)). Specifically, Patent Owner argues that Allum discloses a “design scheme” in which the device tells the user about the user’s conditions, but Conlan’s pushbuttons are designed for the user to tell the device about the user’s condition. *Id.* at 21 (citing Ex. 1008, 3:61–62; Ex. 1010, 6:38–46). Thus, according to Patent Owner, “Allum does not teach or suggest to a [person of ordinary skill in the art] that it should be modified to include Conlan’s pushbuttons for user input because the design scheme of Allum neither requires, nor provides a means for, user input about his or her own stability condition.” *Id.* (citing Ex. 2005 ¶ 48).

Petitioner replies by arguing that Allum does not preclude user input, particularly using buttons to input the user’s conditions such as dizziness. Reply 2–3. Petitioner contends that neither Patent Owner nor Dr. Madisetti provides any support for the assertion that Allum’s design scheme precludes

¹⁵ Although the Patent Owner states “Petitioner has not set forth clear-and-convincing evidence” of a reason to combine, Patent Owner explains that referencing the clear and convincing standard in the Response was an inadvertent error and Patent Owner did not rely on that standard. Sur-reply 1; *see also* Tr. 68:18–69:5 (providing the same explanation).

user input buttons. *Id.* at 3. In Petitioner’s view, because “Allum relates to providing ‘a diagnostic and a rehabilitory tool for *subjects who* are prone to abnormal falling and *who wish to improve their movement control*,’ providing an additional means of capturing user-specified event information . . . , would be consistent with Allum’s goals.” *Id.* (citing Ex. 1008, 3:55–64). Also, regarding Patent Owner’s assertion that *Allum* does not teach or suggest including Conlan’s pushbuttons, Petitioner argues that “there is no requirement that an ‘express, written motivation to combine must appear in prior art references before a finding of obviousness.’” *Id.* at 4 (citing *Ruiz v. A.B. Chance Co.*, 357 F.3d 1270, 1276, (Fed. Cir. 2004)).

We agree with Petitioner. Allum’s and Conlan’s design schemes, although different, are not mutually exclusive. Indeed, in addition to the pushbuttons, Conlan’s monitor includes a movement sensor for detecting a full range of a subject’s movement and a memory in which data obtained by the monitor can be stored and later retrieved for evaluation. Ex. 1010, 2:60–63, 3:56–58, 4:47–49. As such, Conlan combines the pushbuttons for a user to tell the device about the user’s condition with a movement sensor and a memory that enables the device to tell the user (or another person) about the user’s conditions (i.e., the user’s movements).

Furthermore, even if Conlan did not disclose using two design schemes together, the differences in the design schemes identified by Patent Owner would not prevent one of ordinary skill in the art from considering combining the references. Rather, as Petitioner asserts, adding Conlan’s pushbuttons would allow the resulting device to gather additional data relating to a particular event, such as a feeling of dizziness, that pertains to the subject’s balance or movement. *See* Pet. 21–22 (citing Ex. 1010, 6:38–46; Ex. 1003 ¶¶ 78–79); *see also id.* at 34 (arguing that “switches 22,

23 ‘allow the subject to indicate the occurrence of a particular event’ such as ‘dizziness,’ and, when depressed, the switches 22, 23 ‘cause that occurrence to be recorded in the internal memory of the monitor’’). We are persuaded that one of ordinary skill in the art would recognize such additional data to be beneficial to Allum’s diagnostic and rehabilitative tool for people prone to abnormal falling and wishing to improve movement control.

In addition, we are not persuaded by Patent Owner’s assertion that Petitioner’s reply arguments improperly shift the burden of proof to Patent Owner. Sur-reply 2–3. Instead of suggesting that Patent Owner has to disprove that one of ordinary skill in the art would have had a reason to combine the references, Petitioner’s arguments merely dispute Patent Owner’s contention that Allum’s and Conlan’s different design schemes preclude combining the references in the manner proposed.

We also disagree with Patent Owner’s argument that Conlan’s pushbuttons would be purposeless if added to the Allum-Raymond device. *See* Sur-reply 3. On the contrary, as discussed above, we are persuaded that adding the pushbuttons would allow the resulting device to gather additional data relating to a particular event, such as the user experiencing a feeling of dizziness. We also disagree with Patent Owner’s assertion that the proposed combination is nonsensical because “[w]hen the Allum device automatically alerts a user of an impending fall, would the user then push a button to tell the device ‘you just told me that I’m about to fall, so now let me tell you I’m about to fall?’” *Id.* This assertion mischaracterizes the proposed combination. Petitioner contends that the user would use the pushbuttons to input *additional* data (such as dizziness), not to tell the device that it has just alerted the user of a potential fall. Pet. 21–22.

Next, Patent Owner argues that Petitioner fails to show that one of ordinary skill in the art “would have had reasonable expectation of success in modifying Allum’s device to add Conlan’s pushbuttons.” PO Resp. 21 (citing *Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1164 (Fed. Cir. 2006)). Petitioner, however, contends that “[a]ny modifications needed to incorporate Conlan’s teachings into the Allum+Raymond device would have been predictable with a foreseeable chance of success and within the skill of a [person of ordinary skill in the art] because Allum and Conlan utilize ‘conventional’ components.” Pet. 24 (citing Ex. 1010, 10:37–54; Ex. 1008 7:8–10, 16:17–19; Ex. 1003 ¶ 84). Given the relatively uncomplicated nature of Conlan’s pushbuttons, we agree that one of ordinary skill in the art would have had a reasonable expectation of success in making the proposed modification. That Petitioner referred to a “foreseeable chance of success” rather than a “reasonable expectation of success” is of no moment in this case. *See Sun Pharm. Indus. Ltd. v. Aurinia Pharm. Inc.*, IPR2022-00617, Paper 20 at 4–6 (PTAB Mar. 20, 2020) (determining that there is no requirement that a reasonable expectation of success be specifically stated in *ipsis verbis*).

Last, Patent Owner argues that Allum teaches away from the proposed combination for two reasons. PO Resp. 21–22 (citing Ex. 2005 ¶¶ 49–50). The first reason is that “the patients who would use the Allum device are inherently ‘prone to abnormal falling’ as Allum suggests, and likely may not be able to sense or feel instability, as would be required to provide input via the Conlan pushbuttons.” *Id.* (citing Ex. 2005 ¶ 49). The second reason is that

because the Allum device is designed to rely on objective data measured by “body sway sensors” to determine whether a user

has approached dangerously close to, or exceeded, the threshold “cone of stability,” the addition of inputs from users who are inherently incapable of normal fall control would not serve the purposes of the device, but rather distract and confuse the device’s designed monitoring and warning operations.

Id. at 21 (citing Ex. 2005 ¶ 50).

In reply, Petitioner argues that Patent Owner conflates patients who are prone to abnormal falling with patients unable to sense or feel instability. Reply 3. In Petitioner’s view, “a subject that begins to sense the occurrence of a particular event,[] such as ‘dizziness,’ is capable of pushing a button to indicate the beginning of an event corresponding to dizziness.” *Id.* (citing Ex. 1010, 6:38–46; Ex. 1003 ¶ 78). Petitioner also contends that Patent Owner fails to explain how the addition of Conlan’s pushbuttons would have confused the Allum device’s designed monitoring and warning operations.

Id. at 5.

Although Allum’s device is intended for “subjects who are prone to abnormal falling” (Ex. 1008, 3:58–61), we disagree that such subjects would necessarily be unable to sense or feel instability. Neither Patent Owner nor Dr. Madisetti explain adequately why subjects prone to abnormal falling would be unable to sense a feeling of dizziness and press a button in response, as taught by Conlan. *See* PO Resp. 21–22; Ex. 2005 ¶ 49. Both the Response and Dr. Madisetti merely state that subjects prone to abnormal falling “likely may not be able to sense or feel instability,” without explanation. PO Resp. 21–22; Ex. 2005 ¶ 49. Dr. Madisetti’s testimony on this point is a conclusory statement that is not supported sufficiently by objective evidence or analysis. For this reason, we do not credit this testimony. *See* 37 C.F.R. § 42.65(a) (“Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled

to little or no weight.”); *see also Nobel Biocare Services AG v. Instradent USA, Inc.*, 903 F.3d 1365, 1382 (Fed. Cir. 2018) (explaining that the Board can reject arguments based on expert testimony that lacks specificity or detail).

We also disagree with Patent Owner’s second reason—that is, adding Conlan’s pushbuttons to Allum’s device “would not serve the purposes of the device, but rather [would] distract and confuse the device’s designed monitoring and warning operations.” *See* PO Resp. 21 (citing Ex. 2005 ¶ 50). Instead of distracting and confusing the device, we are persuaded that adding Conlan’s pushbuttons would beneficially allow the resulting device to gather additional data relating to a particular event, such as the user feeling dizzy, as discussed above.

Accordingly, we are not persuaded that either reason proffered by Patent Owner shows that Allum teaches away. Neither argument establishes that Allum criticizes or disparages the use of pushbuttons such as Conlan’s, and, thus, Allum does not teach away from the proposed combination. *See DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 567 F.3d 1314, 1327 (Fed. Cir. 2009) (holding a reference does not teach away “if it . . . does not ‘criticize, discredit, or otherwise discourage’ investigation into the invention claimed”).

In sum, we determine that Petitioner’s proposed reasons to combine Allum, Raymond, and Conlan are realistic, have rational underpinning, and are supported by expert testimony, which we find persuasive and credit. Thus, Petitioner’s evidence shows that a skilled artisan would have had reasons to combine the teachings of Allum, Raymond, and Conlan and would have had a reasonable expectation of success in doing so.

b) Limitation [1d-3]

Limitation [1d-3] recites “storing first event information related to the detected first user-defined event along with first time stamp information reflecting a time at which the movement data causing the first user-defined event occurred.”

Petitioner asserts that Allum discloses logging fall warnings for later retrieval and “system processor 14 ‘*save[s] in the processor system memory*’ the ‘circumstances’ of the fall warning, including the ‘time of day’ (*‘along with first time stamp information’*).” Pet. 32–33 (citing Ex. 1008, 14:47–52, 15:48–53). According to Petitioner, one of ordinary skill in the art would have understood that the “circumstances” of Allum’s fall warning would have included the movement data that caused the fall warning to occur. *Id.* at 33 (citing Ex. 1003 ¶ 120).

Alternatively, Petitioner argues that the combination discloses using time stamp information to store time information associated with events and sensor data for the reasons explained in the section of the Petition discussing the reasons for combining Allum and Raymond (*id.* at 15–18). *Id.* at 33 (citing Ex. 1008, 10:10–13, 11:26–50, 14:47–54, 17:1–5; Ex. 1009, 1:42–67, 2:17–30, 10:16–36).

Patent Owner argues that Allum’s “time of day” data reflects the time at which the fall warning was logged, not the time at which the movement data causing the warning occurred. PO Resp. 23 (citing Ex. 2005 ¶ 51). Patent Owner points to Allum’s Figure 6, which is reproduced below, in arguing that the time at which the fall warning is logged is later than the time when the movement data causing the warning occurred. *Id.* at 23–24.

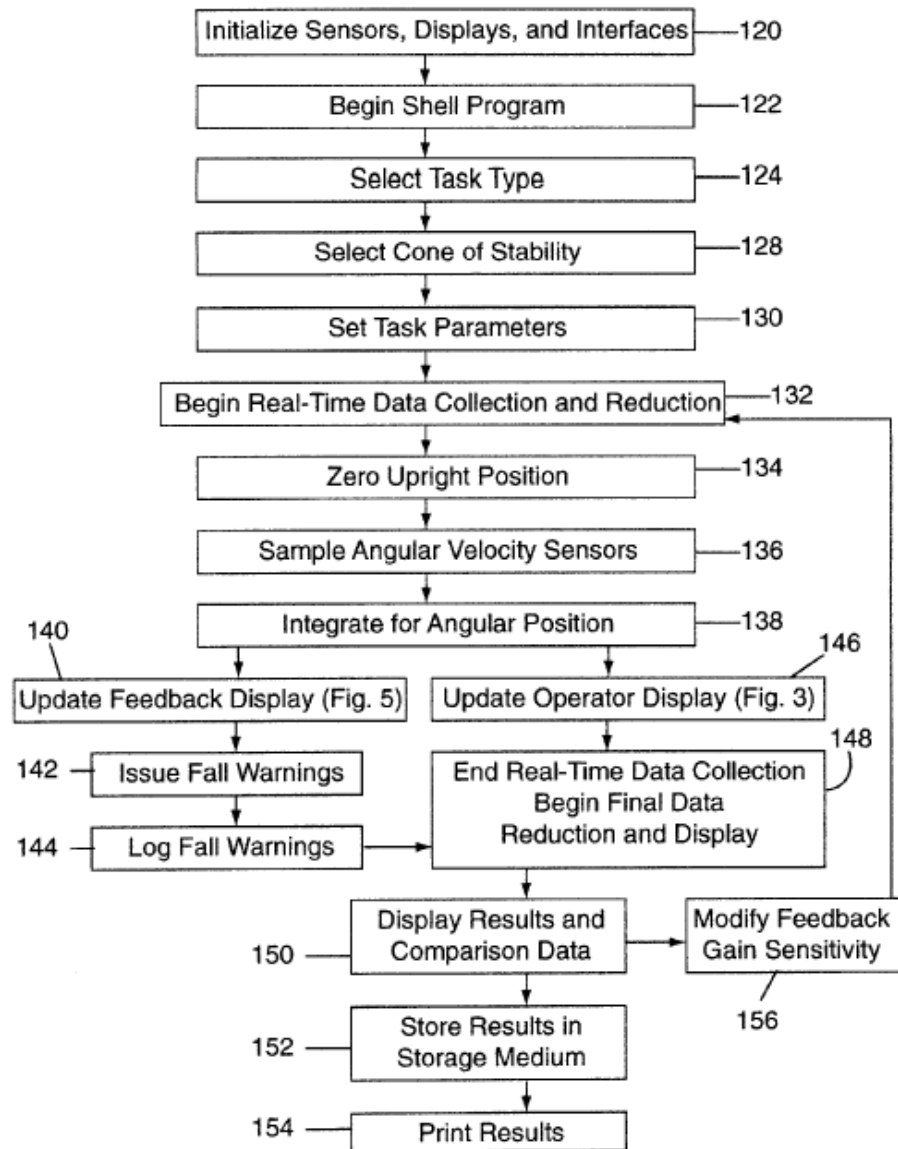


Fig. 6

Figure 6 is “a flow chart illustrating the steps of an exemplary system processor control program algorithm for sampling body sway sensors, providing an operator’s display, and providing visual body sway angle and angular velocity feedback.” Ex. 1008, 6:48–52. According to Patent Owner, one of ordinary skill in the art would understand that the method of Figure 6 is performed from top to bottom, with simultaneous events being

placed side-by-side. PO Resp. 24 (citing Ex. 1008, 15:52–55, Fig. 6; Ex. 2005 ¶ 52). Patent Owner asserts that “[t]he general process is repeated in a loop, where the angular velocity sensors are sampled, then the angular position is calculated by integration, then the displays are updated, then the warnings are issued, and then the ‘time of day’ associated with those warnings, not the movement data, are logged,” such that “at least three steps occur between the movement and the logging (steps 138, 140, and 142), and the alleged ‘time stamp’ reflects a time *after* the movement data occurred.” *Id.* at 24–25 (citing Ex. 1008, 15:36–57, Fig. 6; Ex. 2005 ¶ 52).

Allum discloses that data collection begins at step 132 and includes asking the operator to define the upright reference position for the subject (step 134), sampling body sway sensors 12 (step 136), and integrating the sensor signal values to yield body sway angular position values (step 138). Ex. 1008, 15:30–42, Fig. 6. Allum also discloses simultaneously updating visual feedback system display 90 (step 140) operator’s display 40 (step 146), issuing fall warnings (step 142), and logging the fall warnings (step 144). *Id.* at 15:45–55, Fig. 6.

To the extent that Patent Owner is contending that steps not shown side-by-side in Figure 6 cannot be performed simultaneously, we disagree. For instance, Allum discloses that the “angular position and velocity based body sway diagnosis system in accordance with the present invention may be used to monitor *simultaneously* the body sway of multiple subjects, and to provide rehabilitory feedback to such subjects.” *Id.* at code (57) (emphasis added). Allum also discloses the “a system processor attached to the subject’s body may be programmed to provide the body sway angle and angular velocity feedback signals to a feedback system, 24, 26, 28 or 30,” and “[s]*imultaneously*, body sway angle and body sway angular velocity

information from the body sway sensors 12 may be provided.” *Id.* at 8:8–14. These disclosures indicate that Allum’s steps of collecting data (i.e., steps 132–138) and providing feedback (step 140) are performed simultaneously.

Thus, Patent Owner’s contention that at least three steps occur between the movement occurring and logging the fall warning (PO Resp. 25) does not persuade us that Allum’s “time of day” data does not reflect the time at which the movement data causing the stored fall warning occurred. On the contrary, Allum further discloses that data collection is ended at step 148, which, by virtue of the arrow extending from step 144 to step 148, is depicted as occurring “after” the logging of the fall warnings at step 144. Ex. 1008, 15:57–58, Fig. 6. This disclosure indicates that logging the fall warnings at step 144 occurs while the movement data is being collected, thereby strongly suggesting that the “time of day” data logged with the fall warnings reflects the time at which the movement data causing the fall warnings occurred.

Furthermore, Allum discloses that “[a] warning that the subject is approaching his cone of stability can be given in the form of an audible warning signal that is provided to the subject,” and such a warning “may be given in the form of an audible word, e.g., ‘careful’, or similar words.” Ex. 1008, 5:28–31, 13:49–51. Therefore, as a matter of common sense, one of ordinary skill in the art would understand Allum to issue the fall warning substantially simultaneously to the detection of the movement data that triggered the warning because any delay between the occurrence of the movement and the issuance of the warning would defeat the purpose of the warning. *See KSR*, 550 U.S. at 420 (“Rigid preventative rules that deny factfinders recourse to common sense, however, are neither necessary under

our case law nor consistent with it.”). Although Allum does not expressly indicate the exact timing of logging the warning vis-à-vis the issuance of the warning, common sense would also suggest logging the warning at materially the same time that it is issued.

In view of the above, we are persuaded by Petitioner’s first argument that Allum’s “time of day” data logged with the fall warnings is time stamp information that reflects the time at which the movement data causing the fall warnings occurred. Accordingly, we do not address Petitioner’s alternative argument regarding the time stamp information or Patent Owner’s argument in response.

Last, Patent Owner also contends that arguments and claim amendments made by Patent Owner to distinguish certain prior art during reexamination of the ’576 patent, supports its arguments regarding Allum. PO Resp. 25–26 (citing Ex. 1007, 1, 93, 218–19, 240).¹⁶ Specifically, Patent Owner argues that, like Allum, the prior art applied by the Examiner did not disclose a time stamp reflecting the time at which the movement data causing a first user-defined event occurred, and by amending the claim language to clarify the nature of the time stamp, Patent Owner was able to obtain a Reexamination Certificate. *Id.*

This argument is not persuasive because, as discussed above, we determine that Allum discloses storing time stamp information reflecting the time at which the movement data causing a first user-defined event occurred. Thus, the analogy between Allum and the references applied by the Examiner during reexamination that Patent Owner asserts does not exist.

¹⁶ Although Patent Owner actually cites Exhibit 1002, this appears to be a typographical error in that Exhibit 1007 is the reexamination prosecution history.

Based on the full record before us, we determine that Petitioner has met its burden of establishing that the combination of Allum, Raymond, and Conlan discloses limitation [1d-3].

c) Limitation [1e]

Limitation [1e] recites “at least one user input connected to said microprocessor for controlling the operation of said device.”

For this limitation, Petitioner points to Conlan’s disclosure of user-input pushbutton switches 22, 23 as being connected to a microprocessor. Pet. 33 (citing Ex. 1003 ¶ 121; Ex. 1010, code (57), 6:38–40). Petitioner argues that “switches 22, 23 ‘allow the subject to indicate the occurrence of a particular event’ such as ‘dizziness,’ and, when depressed, the switches 22, 23 ‘cause that occurrence to be recorded in the internal memory of the monitor.’” *Id.* at 34 (citing Ex. 1010, 6:38–46, Fig. 6; Ex. 1003 ¶ 122). Petitioner asserts that switches 22, 23 are user inputs that control operation of the measuring device by causing data for a user-specified event (e.g., dizziness) to be recorded. *Id.* at 35 (citing Ex. 1003 ¶ 123).

Petitioner argues that it would have been obvious to one of ordinary skill in the art to modify the device of the Allum-Raymond combination “to include Conlan’s buttons to enable the device to gather data (e.g., subject’s balance or movement) as it relates to a particular event specified by the user input buttons.” *Id.* at 21–22 (citing Ex. 1003 ¶ 79). Petitioner also articulates reasons, supported with the testimony of Dr. Kenny, to combine the relied-upon aspects of the references with a foreseeable chance of success. *Id.* at 22–24 (citing Ex. 1008, 7:8–10, 16:17–19; Ex. 1010, 1:65–2:2, 4:5–57, 5:64–6:67, 9:1–15, 10:6–65, 11:58–62, Fig. 2; Ex. 1003 ¶¶ 79–84).

Patent Owner's only challenge to this limitation is to repeat the same (in fact, nearly identical) arguments made in connection with Petitioner's reasons to combine the references. *Compare* PO Resp. 20–22, *with id.* at 27–29. For the reasons discussed above, we do not find these arguments persuasive. *See supra* § E.4.a.

Based on the full record before us, we determine that Petitioner has met its burden of establishing that the combination of Allum, Raymond, and Conlan discloses limitation [1e].

d) The Remaining Aspects of Petitioner's Contentions

Patent Owner does not offer any arguments specifically addressing the remaining limitations of claim 1 and, in fact, expressly indicates that it does not dispute that Allum or Raymond discloses each limitation for the limited purpose of Ground 1. PO Resp. 22–23, 29–30. We need not set forth formal findings as to the undisputed assertions by Petitioner that the combination of Allum, Raymond, and Conlan discloses or suggests these limitations. *See LG Elecs., Inc. v. Conversant Wireless Licensing S.A.R.L.*, 759 F. App'x 917, 925 (Fed. Cir. 2019) (“The Board is ‘not required to address undisputed matters’ or arguments about limitations with which it was never presented.” (quoting *In re Nuvasive, Inc.*, 841 F.3d 966, 974 (Fed. Cir. 2016))). Also, we cautioned Patent Owner “that any arguments not raised in the response may be deemed waived.” Paper 11, 9; *cf.* 37 C.F.R. § 42.23(a) (“Any material fact not specifically denied may be considered admitted.”). Nevertheless, we have reviewed Petitioner's contentions with respect to the remaining limitations of claim 1 and find that the combination of Allum, Raymond, and Conlan discloses these limitations as set forth by Petitioner. *See* Pet. 24–32, 35–40.

e) Conclusion

For the above reasons, we determine that Petitioner has shown by a preponderance of the evidence that claim 1 is unpatentable over the combination of Allum, Raymond, and Conlan.

5. Dependent Claim 2

Claim 2 recites “[t]he device of claim 1 further comprising at least one input/output port connected to said microprocessor for downloading said data and uploading said operational parameters to and from a computer.”

First, Petitioner argues that claim 2 would have been obvious over the combination of Allum, Raymond, and Conlan because Allum teaches that microprocessor 14 is connected to various components including input device 22, which can be a conventional computer keyboard, and display unit 18, which can be a computer display console. Pet. 41 (citing Ex. 1008, 7:8–8:1, Fig. 1; Ex. 1003 ¶ 132). According to Petitioner, it would have been obvious to one of ordinary skill in the art that at least some of these connections would have included input/output ports. *Id.* at 42 (citing (Ex. 1003 ¶ 133).

Alternatively, Petitioner argues that “Conlan discloses that its activity monitor 10 (monitoring device) and computer 13 are connected through ‘*a data port*’ of computer 13 by means of a conventional RS-232 cable 15 or the like.” *Id.* at 43 (citing Ex. 1010, 6:1–17, Fig. 2). Petitioner asserts that one of ordinary skill in the art would have understood that a port would be on the measuring device to connect the two ends of the cable. *Id.* (citing Ex.1003 ¶ 134). Thus, in Petitioner’s view,

it would have been obvious to a [person of ordinary skill in the art] that [the combination of Allum, Raymond, and Conlan] includes at least one port connected to the microprocessor 14 for downloading movement data (e.g., to display on display 18)

and uploading operational parameters (e.g., user-entered cone of stability values) to and from the operator's computer.

Id. (citing Ex.1003 ¶ 134; Ex. 1008, 14:61–15:60).

Patent Owner argues that Petitioner's reliance on the teachings of Allum for claim 2 is flawed. PO Resp. 31. Patent Owner, however, does not offer any arguments specifically addressing Petitioner's alternative argument relying on the teachings of Conlan and, in fact, expressly indicates that it does not dispute that Conlan discloses claim 2. *Id.* Accordingly, we need not address Petitioner's undisputed alternative argument that the combination of Allum, Raymond, and Conlan discloses the limitations introduced in claim 2. *See LG Elecs.*, 759 F. App'x at 925; *see also* 37 C.F.R. § 42.23(a) ("Any material fact not specifically denied may be considered admitted."). Nevertheless, we have reviewed Petitioner's alternative argument and find that it satisfies Petitioner's burden of establishing that the combination of Allum, Raymond, and Conlan discloses claim 2.

For the above reasons, we determine that Petitioner has shown by a preponderance of the evidence that claim 2 is unpatentable over the combination of Allum, Raymond, and Conlan.

6. *Dependent Claim 3*

Claim 3 recites "[t]he device of claim 1 wherein said device is compact and weighs less than one pound."

Petitioner argues that Allum discloses that its sensors are lightweight. Pet. 44 (citing Ex. 1008, 4:5–8, 6:8–11, 6:67). Petitioner also argues that "[e]xample implementations of Allum's sensors include the Litef Micro Fors 36 Fiber Optic Rate Sensor . . . and ADS-C232 from Watson Industries, Inc., which according to their specification sheets *weigh less than 110g or*

137g (Litef) and 60g (Watson ADS-C232).” *Id.* (citing Ex. 1021, 2; Ex. 1022, 2). Petitioner further argues that even if two sensors are used, the combination would have weighed substantially less than one pound. *Id.* at 44–45. Petitioner then concludes that “[b]ased on Allum’s design objectives and the example implementations, it would have been obvious to a [person of ordinary skill in the art] that Allum’s device would have been compact and weighed less than one pound.” *Id.* at 45 (citing Ex. 1003 ¶ 135; Ex. 1019, 3; Ex. 1020, 2; Ex. 1026, 234; Ex. 1027, 485–86).

In addition, Petitioner argues that Allum discloses using a pair of “lightweight” eyewear for visual feedback, and that using lightweight eyewear would have been obvious to one of ordinary skill in the art so as to limit weight and pressure on the user’s face. *Id.* (citing Ex. 1008, code (57), 4:64–67; Ex. 1003 ¶ 136). Petitioner presents an example of light eyewear (provided by Beadles almost 17 years prior to the ’576 patent’s filing date) that weighs 56 grams or less. *Id.* (citing Ex. 1015, 2:13–23). Petitioner also argues that given

the market demand for reduced eyewear size and weight and the progression of technology over 17 years driving improvements in eyewear technology, it would have been obvious to a [person of ordinary skill in the art] that Allum’s lightweight eyewear 80 and accompanying imaging system 84 would have been compact and even less than 56 grams.

Id. (citing Ex. 1003 ¶ 136; Ex. 1028, 1:14–15). According to Petitioner,

in view of Allum’s design objectives of implementing a lightweight monitor that does not prohibit user movement, it would have been obvious to a [person of ordinary skill in the art] that the aggregated weight of all the elements of Allum’s monitoring device would have been a light weight, e.g., less than one pound.

Id. at 45–46 (citing Ex. 1008, 8:27–47; Ex. 1003 ¶ 136).

In the Response, Patent Owner argues that Petitioner's reliance on the Beadles eyewear as an example is flawed because the Beadles eyewear lacks a monocular virtual imaging system necessary to Allum's eyewear. PO Resp. 31–32 (citing Ex. 1008, 12:9–12). Patent Owner also argues that Allum discloses using multiple accelerometers, as well the power source, microprocessor, and memory. *Id.* at 32.

Petitioner replies by arguing that Patent Owner fails to appreciate that claim 3 is obvious over the combination of Allum, Raymond, and Conlan. Reply 20. In particular, Petitioner asserts that “with corroborating evidence from secondary sources, such as datasheets and specifications of sensors, accelerometers, chips, [it] explained why it would have been obvious for [the Allum-Raymond-Conlan] device to be compact and weigh less than one pound.” *Id.* at 21 (citing Pet. 44–46, Ex. 1003 ¶¶ 135–136). Petitioner points to Dr. Kenny's testimony explaining that market trends demanded lower weight and increasingly compact sensors and lighter eyewear and thus, it would have been obvious to one of ordinary skill in the art that the Allum-Raymond-Conlan device weighs less than one pound. *Id.* at 21–22 (citing Ex. 1003 ¶¶ 135–136).

On balance, we agree with Petitioner. Although we agree with Patent Owner that the Beadles eyewear example is flawed, Petitioner's arguments do not rely on the examples only, but largely depend on the assertion that market forces and Allum's design objectives suggest a weight of less than one pound. This assertion is supported by Dr. Kenny's uncontroverted testimony, which we credit. *See* Ex. 1003 ¶¶ 135–136.

For the above reasons, we determine that Petitioner has shown by a preponderance of the evidence that claim 3 is unpatentable over the combination of Allum, Raymond, and Conlan.

7. *Dependent Claim 30*

Claim 30 recites “[t]he device of claim 1, wherein said microprocessor is configured to store, in said memory, date information associated with the first time stamp information.”

Petitioner contends that the combination of Allum, Raymond, and Conlan discloses storing first time stamp information but does not disclose explicitly that the time stamp information includes date information. Pet. 49. Instead, Petitioner argues that “[t]t was notoriously well-known and would have been obvious to a [person of ordinary skill in the art] that the first time stamp information, which is used to create the subject’s medical history, would have included date information so that information could be organized chronologically in the medical history.” *Id.* (citing Ex. 1003 ¶ 168). Petitioner asserts that this well-known understanding is corroborated by two patent publications, which teach that a time stamp includes date and time information. *Id.* (citing Ex. 1003 ¶ 168; Ex. 1013, 27:62–66; Ex. 1017, 11:1–12).

Patent Owner asserts that Petitioner’s argument is a “conclusory statement” lacking “arguments about any teaching, suggestion, motivation, or expectation of success.” PO Resp. 36. We disagree. Petitioner’s argument is supported by evidence of record (i.e., Exhibits 1013 and 1017) and Dr. Kenny’s uncontroverted testimony, which we credit. *See* Ex. 1003 ¶ 168.

Accordingly, we determine that Petitioner has shown by a preponderance of the evidence that claim 30 is unpatentable over the combination of Allum, Raymond, and Conlan.

8. *Dependent Claims 4, 5, 8–11, 36, 39–42, 45–51, 61–63, 144, and 147*

Claims 4, 5, 8–11, 36, 39–42, 45–51, 61–63, 144, and 147 depend from claim 1. Petitioner provides reasonable and detailed explanations, supported by the testimony of Dr. Kenny, indicating where in the references the limitations of claims 4, 5, 8–11, 36, 39–42, 45–51, 61–63, 144, and 147 are disclosed. Pet. 46–47, 49–63. Patent Owner offers no specific argument disputing Petitioner’s contentions with respect to these claims. PO Resp. 32–33, 35–39.

We have considered the evidence and arguments of record and determine that Petitioner has demonstrated by a preponderance of the evidence that the combination of Allum, Raymond, and Conlan renders obvious claims 4, 5, 8–11, 36, 39–42, 45–51, 61–63, 144, and 147 for the reasons discussed in the Petition and as supported by the testimony of Dr. Kenny.

9. *Independent Claim 20*

Independent claim 20 recites a method to monitor physical movement of a body part having similar limitations as the device claim of claim 1, with one difference being that claim 1 recites interpreting movement data based on user-defined operational parameters (limitation [1d-1]), but claim 20 recites interpreting movement data based on user-defined operational parameters and a real-time clock (limitation [20c]). *Compare* Ex. 1001, 1:25–50 C1, *with id.* at 2:23–42 C1.

Regarding limitation [20c] (“interpreting, using a microprocessor included in the portable, self-contained movement measuring device, said physical movement data based on user-defined operational parameters and a real-time clock”), Petitioner asserts that, as part of its interpretation of body

sway data, Allum discloses logging the time of day when a warning is provided to a subject, and one of ordinary skill in the art would have understood that the interpretation of the movement data is based on the time provided by the real time clock. Pet. 48 (citing Ex. 1008, 14:47–54; Ex. 1003 ¶ 147).

Alternatively, Petitioner argues that, to the extent Patent Owner argues that Allum does not disclose a real time clock, the combination includes Raymond’s real time clock, which would have been connected to the microprocessor so that the microprocessor could use the time from the real time clock to perform time synchronization and time stamp collected sensor data. *Id.* (citing Ex. 1003 ¶ 148).

Patent Owner argues that Petitioner fails to explain how Allum’s disclosure of logging the time of day teaches interpreting physical movement data. PO Resp. 33–34 (citing Ex. 2005 ¶ 55). According to Patent Owner, “[i]nterpretation requires an analysis of the movement data,” but Allum merely logs the time of day associated with an event. *Id.* at 34 (citing Ex. 2005 ¶ 55). Patent Owner argues further that, even if Allum contains a real time clock, “the real time clock would be the basis for **logging** the issuance of a warning, not the basis for the microprocessor **interpreting** ‘said physical movement data.’” *Id.* (citing Ex. 2005 ¶ 56).

Regarding Petitioner’s reliance on Raymond’s real time clock, Patent Owner argues that Raymond’s real time clock is not associated with physical movement data. *Id.* at 35 (citing Ex. 2005 ¶ 57).

In reply, Petitioner first argues that Patent Owner’s argument that “interpreting” requires an analysis is wrong. Reply 15. Instead, Petitioner indicates that “interpreting” should be construed as “to explain or tell the

meaning of; translate into intelligible or familiar language or terms present in understandable terms; to represent by means of art.” *Id.* (citing Ex. 1041).

Petitioner also argues that

Allum interprets (e.g., explains, tells the meaning of, translates) the movement data based on the time of day to determine, store, and display the movement data and circumstances around a fall warning. For example, Allum’s system can determine and store data indicating that an event occurred at a certain time by interpreting physical movement data based on the time of day information, and store this information in memory 16 as part of the circumstances around a fall warning.

Id. at 17. Even applying Petitioner’s construction of “interpreting,” however, we are not persuaded that Allum’s logging the time of day when a warning signal is issued “explains, tells the meaning of, or translates” the physical movement data. Rather, we agree with Patent Owner that Allum’s act of logging the time of day merely associates the time with the movement data. In the Reply, Petitioner argues that Allum discloses displaying a time history of the user movements in addition to logging the time of day when a warning signal is issued. Reply 16–18 (citing Ex. 1008, 4:23–32, 10:10–17, Fig. 3). To the extent that this new argument even should be considered, we are not persuaded that displaying time histories “explains, tells the meaning of, or translates” the physical movement data any more than logging the time of day does. Allum discloses that a time history of the subject’s angular sway deviations and angular sway velocity are displayed on displays 42 and 44. Ex. 1008, 10:10–13. Displaying the movement data as a function of time, however, does not “explain” the data, and certainly does not tell its meaning or translate it.

In reply to Patent Owner’s argument that Raymond’s real time clock is not associated with physical movement data, Petitioner asserts that Patent

Owner mischaracterizes Raymond. Reply 19. Petitioner contends that Raymond's real time clock is not limited to providing the time associated with user-collected data because "Raymond discloses that '*a combination of sensed physiological data*' and subjective data entered by the patient' is collected," and "[a]s the data is collected, it is time stamped, compressed (where appropriate) and uploaded to the database, labeled for the patient in question." *Id.* (citing Ex. 1009, 2:17–29). We are not persuaded, however, that these disclosures of Raymond suggest that the collected data is interpreted based on the real time clock, even applying Petitioner's construction of "interpreting." Time stamping the data does not explain, tell the meaning of, or translate" the movement data.

In view of the above, we are not persuaded that Petitioner has met its burden of showing, by a preponderance of the evidence, that independent claim 20 is unpatentable over the combination of Allum, Raymond, and Conlan.

10. Dependent Claim 25

Claim 25 depends from claim 20 and thus contains all the limitations of claim 20. Petitioner's challenge to dependent claim 25 does not overcome the deficiencies of the combination of Allum, Raymond, and Conlan with respect to claim 20. *See* Pet. 49. Accordingly, for the same reasons discussed above in connection with claim 20, we also determine Petitioner has not demonstrated, by a preponderance of the evidence that claim 20 is unpatentable over the combination of Allum, Raymond, and Conlan.

F. Ground 1A/2: Asserted Obviousness Based on Allum, Raymond, and Conlan or Allum, Raymond, Conlan, and de Remer

Claim 31 recites “[t]he device of claim 1, wherein said microprocessor is configured to retrieve said first time stamp information from said real-time clock and associate the retrieved first time stamp information with said first user-defined event,” and claim 32 recites “[t]he device of claim 31, wherein said microprocessor is configured to retrieve said first time stamp information from said real-time clock based on the detection of the user-defined event.”

Petitioner contends that claims 31 and 32 are unpatentable under 35 U.S.C. § 103(a) based on (1) the combination of Allum, Raymond, and Conlan or (2) the combination Allum, Raymond, Conlan, and de Remer. Pet. 63–67. Specifically, Petitioner contends that the combination of Allum, Raymond, and Conlan renders claim 31 obvious because “it would have been obvious to a [person of ordinary skill in the art] that Raymond’s RT clock in the [Allum-Raymond-Conlan] device would provide time information to the microprocessor to generate the first time stamp information for the first user-defined event.” *Id.* at 64 (citing Ex. 1008, 10:10–13, 11:26–50, 14:47–54, 17:1–5; Ex. 1009, 1:42–67, 2:17–30, 17:5–52, 10:16–36; Ex. 1003 ¶¶ 91, 169). Alternatively, Petitioner argues that one of ordinary skill in the art would have relied on de Remers’ teaching of using date and time information from the RT clock to fill the fields in a time stamp. *Id.* (citing Ex. 1013, 23:13–23, Ex. 1003 ¶¶ 92, 170). Petitioner also contends that either combination renders claim 32 obvious. *Id.* at 65–67 (citing Ex. 1008, 15:35–54, Fig. 6, Ex. 1009, 2:24–30; Ex. 1003 ¶¶ 171–172).

In its Response, Patent Owner attacks Petitioner’s proposed combination Allum, Raymond, Conlan, and de Remer, arguing that de Remer is not analogous art. PO Resp. 39–40. Patent Owner, however, does not offer any arguments specifically addressing Petitioner’s assertion that the combination of Allum, Raymond, and Conlan renders claims 31 and 32 unpatentable and, in fact, expressly indicates that it does not dispute that Allum discloses both claims. *Id.* at 40.

We need not set forth formal findings as to the undisputed assertions by Petitioner that the combination of Allum, Raymond, and Conlan renders claims 31 and 32 unpatentable. *See LG Elecs.*, 759 F. App’x at 925; *see also* 37 C.F.R. § 42.23(a) (“Any material fact not specifically denied may be considered admitted.”). Nevertheless, we have reviewed Petitioner’s contentions and are persuaded that claims 31 and 32 are unpatentable over the combination of Allum, Raymond, and Conlan. *See* Pet. 64–67. Accordingly, we do not address Petitioner’s contentions based on the combination Allum, Raymond, Conlan, and de Remer.

For the above reasons, we determine that Petitioner has shown by a preponderance of the evidence that claims 31 and 32 are unpatentable over the combination of Allum, Raymond, and Conlan.

G. Ground 3: Asserted Obviousness Based on Allum, Raymond, Conlan, and Gaudet

Petitioner contends that claims 64 and 65 are unpatentable under 35 U.S.C. § 103(a) based on Allum, Raymond, Conlan, and Gaudet. Pet. 67–71. Patent Owner provides arguments addressing this asserted ground of unpatentability. PO Resp. 40–42. We first summarize Gaudet (the other references are summarized above) and then address the parties’ contentions.

1. Gaudet

Gaudet relates to monitoring the orthopedic motion of a person, particularly the foot contact time, foot loft time, speed, and/or pace of the person. Ex. 1012, 1:7–10. Gaudet uses output from an accelerometer “to determine: (1) instances at which a foot of a user in locomotion leaves a surface, and (2) instances at which the foot of the user impacts the surface.” *Id.* at 2:6–10. For instance, accelerometer device 20A is mounted on the ankle of a user, device 20B is mounted on or in the user’s shoe, and device 20C is mounted to the user’s waist. *Id.* at 4:57–60, Fig. 2. The output of the accelerometers may be used to calculate various attributes, including the distance traveled by the user. *Id.* at 2:16–26.

2. Discussion

Claim 64 recites “[t]he device of claim 1, wherein said movement sensor is configured to measure a walking distance,” and claim 65 recites “[t]he device of claim 64, wherein said device is configured to be wearable by the user, and said movement sensor is configured to measure said walking distance of said user.”

Petitioner argues that it would have been obvious to one of ordinary skill in the art to use Allum’s accelerometers to additionally determine a subject’s movement such as a walking distance and pace of the subject, as taught by Gaudet. Pet. 69 (citing Ex. 1003 ¶ 89). According to Petitioner, “providing additional data such as the user’s walking distance would have been consistent with Allum and Raymond’s objectives to provide a history of the user’s movements.” *Id.* (citing Ex. 1003 ¶ 89). Petitioner also asserts that “using accelerometers to measure distance traveled by the user was already well-known and thus would have been obvious extension of Allum’s accelerometers.” *Id.* (citing Ex. 1012, 1:35–67).

Patent Owner argues that Gaudet relates to measuring the pace at which someone is moving and, unlike Allum, Raymond, and Conlan, is not concerned with the safety of the user because its focus is athletic in nature. PO Resp. 41. Patent Owner argues further that one of ordinary skill in the art “would not have been motivated to combine these four different inventions as they are in different fields of endeavor and aim to solve different problems.” *Id.* (citing Ex. 2005 ¶ 58). Patent Owner also indicates that it does not dispute that Allum discloses claim 64 for the limited purpose of this ground. *Id.*

Petitioner argues that Gaudet uses accelerometers to determine the pace and distance of a subject’s movement and, thus, directly relates to “the tracking of a person’s movement,” which Patent Owner identifies as the “main problem” of the ’576 patent. Reply 24 (citing PO Resp. 40; Ex. 1012, code (57), 2:6–26, 2:47–53, 15:37–47, 16:19–23, Figs. 11, 13; Ex. 1003 ¶ 85). Petitioner also disputes Patent Owner’s contention that Gaudet’s focus is athletic in nature, arguing that Gaudet makes no mention of “athletic” or “sports” and relates to monitoring user movement such as walking. *Id.* (citing Ex. 1012, 1:6–10, 2:6–26).

A reference qualifies as prior art for an obviousness determination under 35 U.S.C. § 103(a) when it is analogous to the claimed invention. *In re Klein*, 647 F.3d 1343, 1348 (Fed. Cir. 2011).

Two separate tests define the scope of analogous prior art: (1) whether the art is from the same field of endeavor, regardless of the problem addressed and, (2) if the reference is not within the field of the inventor’s endeavor, whether the reference still is reasonably pertinent to the particular problem with which the inventor is involved.

In re Bigio, 381 F.3d 1320, 1325 (Fed. Cir. 2004) (citing *In re Deminski*, 796 F.2d 436, 442 (Fed. Cir. 1986)). As an initial point, Patent Owner misconstrues the *Bigio* test to require the references to be analogous to each other instead of to the challenged patent. *Cf. Sanofi-Aventis Deutschland GmbH v. Mylan Pharms. Inc.*, 66 F.4th 1373, 1380 (Fed. Cir. 2023) (“Because Mylan argued that de Gennes is analogous to another prior art reference and not the challenged patent, Mylan did not meet its burden to establish obviousness. . . .”). We find Patent Owner’s argument unpersuasive for this reason.

Furthermore, we find that Gaudet is in the same field of endeavor as the ’576 patent based on the record before us. The specification of the ’576 patent states that “[t]his invention relates to the field of electronic training and safety devices used to monitor human physical activity.” Ex. 1001, 1:6–7. Gaudet falls squarely in this field, describing an invention that “relates to the monitoring of the orthopedic motion of a person.” Ex. 1012, 1:7–8. More specifically, both the ’576 patent and Gaudet describe using sensors, such as accelerometers, to measure a user’s movements. Ex. 1001, 2:9–13, 4:37–48; Ex. 1012, 2:6–26. These structural similarities would have led one of ordinary skill in the art working in the field of the ’576 patent to consider Gaudet’s disclosure. Gaudet’s failure to state expressly that its device is used for “training and safety” does not put it in a different field of endeavor. Rather, Gaudet discloses that its device can determine a person’s rate of travel, distance traveled, and ambulatory expended energy. Ex. 1012, 1:16–20. One of ordinary skill in the art would have recognized these measurements are commonly used in assessing a person’s training and health.

For the above reasons, we determine that Gaudet is analogous art. Furthermore, we have considered the evidence and arguments of record and determine that Petitioner has met its burden of establishing that the combination of Allum, Raymond, Conlan, and Gaudet discloses claim 64. As for claim 65, we are persuaded by Petitioner's arguments that Allum teaches a device that is wearable by the user. *See* Pet. 25, 61–62, 71.

Accordingly, we determine that Petitioner has shown by a preponderance of the evidence that claims 64 and 65 are unpatentable over the combination of Allum, Raymond, Conlan, and Gaudet.

H. Ground 4: Asserted Obviousness Based on Gesink and Raymond

Petitioner asserts that claims 20 and 25 of the '576 patent are unpatentable under 35 U.S.C. § 103(a) based on Gesink and Raymond. Pet. 71–86. Patent Owner provides arguments addressing this asserted ground of unpatentability. PO Resp. 42–46. We first summarize Gesink (Raymond is summarized above) and then address the parties' contentions.

1. Gesink

Gesink relates to a learning and assessment aid for helping an individual with a severe visual impairment develop appropriate locomotion habits. Ex. 1014, 2:45–48. The learning and assessment aid collects data regarding the visually impaired individual's locomotion habits and provides the individual with indications regarding his or her ability to walk and a straight line and execute turns. *Id.* at 2:48–52.

We reproduce Figure 1 below.

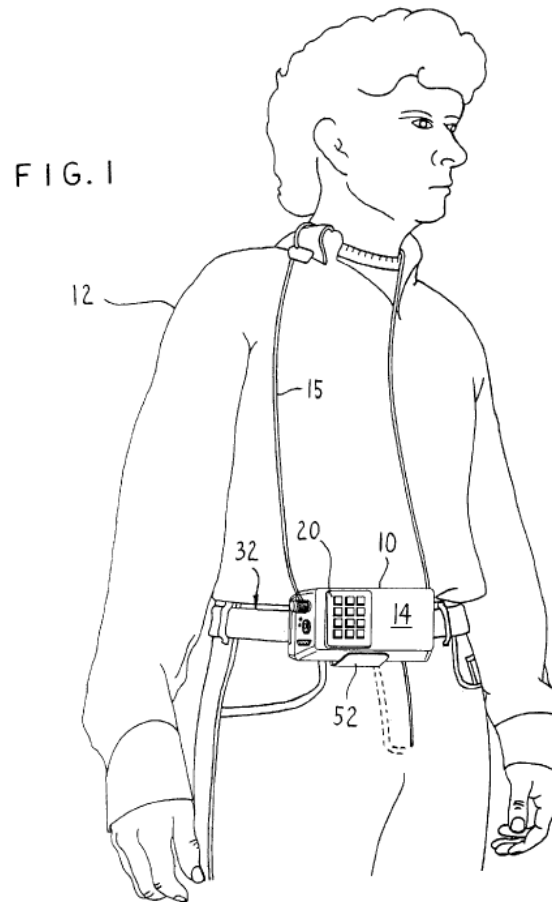


Figure 1 is a perspective view of the learning and assessment aid worn by an individual. Ex. 1014, 3:52–54. Learning and assessment aid 10 includes housing 14 enclosing the internal components, including gyroscope 16 and microprocessor 18. *Id.* at 4:12–15. Gyroscope 16 produces signals representative of the movement of the learning and assessment aid 10 and individual 12. *Id.* at 4:16–20. Microprocessor 18 receives the signals and generates output signals indicative of individual's 12 movement. *Id.* at 4:20–24. Gyroscope 16 can be replaced by accelerometers. *Id.* at 16:18–19. Keypad 20 mounted to the outside of housing 14 allows individual 12 to enter commands indicating the type of ambulatory movement to be monitored. *Id.* at 4:24–27. Housing further includes

speaker 22 that generates audible signals and display 28, start button 24, volume control 26, and display 28. *Id.* at 4:27–40.

Learning and assessment aid 10 can be used to foster the individual’s straight-line movement where the individual indicates the degree of veer that is allowed before a warning signal is generated. *Id.* at 3:26–29.

2. Independent Claim 20

Petitioner articulates reasons that one of ordinary skill in the art allegedly would have combined the teachings Gesink and Raymond in the manner proposed. Pet. 76–78. Petitioner contends that the proposed combination of Gesink and Raymond discloses the limitations of claim 20. *Id.* at 78–86. Patent Owner argues that Petitioner’s reasons for combining Gesink and Raymond lack merit. PO Resp. 42–43. Patent Owner also argues that the proposed combination fails to satisfy either limitation [20c] or limitation [20f]. *Id.* at 43–45.

a) The Combination of Gesink and Raymond

Petitioner contends that one of ordinary skill in the art “would have combined Gesink and Raymond to produce the obvious, foreseeable, and predictable result of Gesink’s wearable learning aid having a RT clock for generating time data and supporting the sequencing and time-stamping of data.” Pet. 76 (citing Ex. 1003 ¶¶ 102–104). More specifically, Petitioner asserts that it would have been obvious to one of ordinary skill in the art “to apply Raymond’s teachings of a real time clock and time-stamping data to Gesink’s learning aid.” *Id.* at 78 (citing Ex. 1003 ¶ 109).

To support these assertions, Petitioner argues that one of ordinary skill in the art would have looked to Raymond’s real time clock as a clock that could provide time data to Gesink’s microprocessor for tracking the duration of a walking test and recording the time of the test and the time at which

maximum veer was exceeded. *Id.* at 76 (citing Ex. 1003 ¶ 106).

Furthermore, Petitioner argues that one of ordinary skill in the art would have found the proposed modification predictable because both Gesink and Raymond use time data for similar purposes. *Id.* (citing Ex. 1014, 13:55–59, Ex. 1009, 1:42–2:46; Ex. 1003 ¶ 106). Petitioner also argues that one of ordinary skill in the art would have modified Gesink to collect the time and circumstances of a subject failing a walking test to help a professional better understand the subject’s issues. *Id.* at 77 (citing Ex. 1009, 1:42–57, 2:31–46; Ex. 1003 ¶ 106). In addition, Petitioner argues that adding a real time clock to Gesink would have been predictable and within the level of ordinary skill because a publicly available version of the DS5000 microprocessor describe in Gesink included a real time clock. *Id.* (citing Ex. 1014, 8:53–55; Ex. 1018, 4:12–17; Ex. 1003 ¶ 108). Petitioner also asserts that the proposed combination “amounts to combining prior art elements according to conventional methods to yield the predictable and beneficial result of Gesink’s learning aid facilitating better ambulatory training outcomes and improving the tracking and timestamping of data collected.” *Id.* at 78 (citing Ex. 1003 ¶ 109).

Patent Owner argues that Petitioner has not shown that one of ordinary skill in the art would have been motivated to combine Gesink and Raymond. PO Resp. 42 (citing *KSR*, 550 U.S. at 421; *Micro Chemical*, 103 F.3d at 1546). According to Patent Owner, “Gesink discloses a design scheme where ***the device tells the user*** about the user’s conditions (direction and veer),” but “Raymond is designed for ***the user to tell the device*** about the user’s condition, the exact opposite of the design scheme and stated purpose of Gesink’s device.” *Id.* at 42–43 (citing Ex. 1014, code (57), 4:27–28; Ex. 1009, 5:40–41; Ex. 2005 ¶ 59). In view of this disparity in schemes,

Patent Owner argues that Gesink does not teach or suggest that it should be combined with Raymond. *Id.* at 43 (citing Ex. 2005 ¶ 59). Patent Owner further contends that one of ordinary skill in the art would not have been motivated to modify Gesink’s design with Raymond because Gesink “teaches away” from including input based on the user’s feelings. *Id.* (citing *Medichem*, 437 F.3d at 1164).

Petitioner replies by arguing that Patent Owner’s assertion that “Raymond is designed for *the user to tell the device* about the user’s condition” mischaracterizes Raymond. Reply 26. Petitioner argues that “Raymond uses monitor 108 to collect ‘objective data on the patient’s physical condition via a plurality of automatically-controlled physiological sensors,’ and logger 106 to collect subjective data from a patient” and “is not limited to the user telling the device about the user’s condition.” *Id.* (citing Ex. 1009, 5:12–44). Petitioner also contends that Patent Owner’s argument is not relevant to the proposed combination in which Raymond is relied on for disclosing a real time clock and, thus, is not related to Patent Owner’s assertion that a user providing input to Raymond’s device is not compatible or teaches away from combining with Gesink. *Id.*

We agree with Petitioner. Raymond states that:

The monitor 108 collects objective data on the patient’s physical condition via a plurality of automatically-controlled physiological sensors. The subjective data logger collects subjective information from the patient by providing the patient with an input device having data prompts such as questions regarding the patient’s condition. Within the context of this description, the term ‘objective’ data will refer to that data which is obtained by sensing the patient’s physiological parameters. Correspondingly, the term ‘subjective’ data will refer to that data which is input by the patient to the data logger 106.

Ex. 1009, 5:31–41; *see also id.* at 2:17–19 (“The preferred embodiment of the data collection portion of the invention collects a combination of sensed physiological data and subjective data entered by the patient.”). The objective data collected from the physiological sensors, together with the subjective data, are stored locally and uploaded to central database 102 for subsequent retrieval and analysis. *Id.* at 2:24–29, 5:12–14. The sensed objective data in central database 102 are at least indirectly accessible by the patient. *Id.* 27:37–46. Thus, Raymond clearly discloses both a scheme in which the device tells the user about the user’s conditions and a scheme in which the user to tell the device about the user’s condition.

As such, contrary to Patent Owner’s contention, the prior art discloses that both the alleged different design schemes can be used together. Furthermore, Gesink’s failure to disclose the same user input taught by Raymond does not mean that Gesink teaches away from the proposed combination. Patent Owner does not direct us to anything in Gesink that “criticize[s], discredit[s], or otherwise discourage[s]” such user input. *See DePuy Spine*, 567 F.3d at 1327.

In addition, Patent Owner argues that Gesink and Raymond are non-analogous art because they “are from different fields of endeavor (ambulatory aids for the visually impaired and physiological monitoring devices, respectively), and Raymond is not reasonably pertinent to any problem relevant to Gesink.” *Id.* (citing *Bigio*, 381 F.3d at 1325).

Patent Owner, however, again misconstrues the *Bigio* test to require the references to be analogous to each other instead of to the challenged patent. Thus, we find Patent Owner’s argument unavailing.

For the above reasons, Patent Owner’s arguments are not persuasive. On the full record, we determine that Petitioner’s proposed reasons to

combine Gesink and Raymond are realistic, have rational underpinning, and are supported by expert testimony, which we find persuasive and credit. Thus, Petitioner's evidence shows that a skilled artisan would have had reasons to combine the teachings of Gesink and Raymond and would have had a reasonable expectation of success in doing so.

b) Limitation [20c]

Limitation [20c] recites “interpreting, using a microprocessor included in the portable, self-contained movement measuring device, said physical movement data based on user-defined operational parameters and a real-time clock.”

Petitioner argues that Gesink's microprocessor 18 interprets physical movement data (i.e., the user's walking data) based on user-defined operational parameters (i.e., the user-specified maximum veer and time duration). Pet. 82–83 (citing Ex. 1003 ¶¶ 158–159). Petitioner also argues that “Gesink teaches that the microprocessor 18 ‘compares the elapsed time of this test to the previously entered test duration,’ and determines whether ‘the total time of the test is equal to or greater than the user-entered test duration,’” and, therefore, suggests interpreting based on a real time clock. *Id.* at 83 (citing Ex. 1014, 13:60–14:2; Ex. 1003 ¶ 160).

Alternatively, Petitioner argues that “the Gesink-Raymond combination would have included RT clock [155] having ‘a timer which every thirteenth oscillation provides a “wakeup” pulse to’ a processor such as microprocessor 18 (in place of Raymond's CPU 141),” and “[t]he interpretation of the movement data during the walking test would have been based, in part, on a time duration clocked by Raymond's RT clock and on time data generated by the RT clock indicating the time at which the

maximum veer was exceeded.” *Id.* (citing Ex. 1009, 10:1–36; Ex. 1003 ¶ 161).

In its Response, Patent Owner first argues that the elapsed time disclosed by Gesink is not real time. PO Resp. 44. We agree with Patent Owner that, although Gesink discloses using elapsed time to determine whether total test time exceeds the preset test duration, Petitioner does not show sufficiently that Gesink suggests monitoring elapsed time with a real time clock.

As for Petitioner’s alternative argument, Patent Owner asserts that Raymond’s real time clock only provides the time associated with user-collected data (i.e., the time at which the user manually records discomfort) and it not associated with the physical movement data. PO Resp. 44. Thus, according to Patent Owner, Raymond’s real time clock it is not used to interpret the objective physical movement data. *Id.* (citing Ex. 2005 ¶ 57).

Petitioner disagrees, arguing that Raymond’s real time clock is not limited to subjective user inputs because it “is used with measurements obtained from sensors such as gyroscopes, as described in the Petition.” Reply 27–28 (citing Pet. 80–83; Ex. 1003 ¶¶ 156–160). We find this argument persuasive. As noted above, the Petition states that Raymond’s real time clock has “a timer which every thirteenth oscillation provides a “wakeup” pulse to’ a processor such as microprocessor 18 (in place of Raymond’s CPU 141).” Pet. 83 (citing Ex. 1009, 10:1–15). The Petition further states that “[t]he wakeup pulse is used to initiate data collection sequence and synchronize each data sampling event.” *Id.* (citing Ex. 1009, 10:16–36; Ex. 1003 ¶ 161).

We agree with Petitioner that Raymond discloses using the real time clock to initiate the data collection sequence or a sampling event. *See* Ex. 1009, 10:11–15, 10:33–36. Thus, because it initiates data collection, we are persuaded that Raymond’s real time clock is associated with the physical movement data. Moreover, Patent Owner only cites Dr. Madisetti’s declaration to support its assertion that Raymond’s real time clock is not associated with the physical movement data. PO Resp. 44 (citing Ex. 2005 ¶ 57). Dr. Madisetti testifies that: “Upon examination of Raymond, it is clear that the Raymond RT clock is not associated with the underlying **‘physical movement data.’** It is not used to interpret the objective sensor **physical movement data** at all and is only associated with the subjective user inputs.” Ex. 2005 ¶ 57. Dr. Madisetti, however, does not point to anything in Raymond to support the conclusion that “it is clear that the Raymond RT clock is not associated with the underlying **‘physical movement data.’**” Accordingly, Dr. Madisetti’s testimony is not supported sufficiently by objective evidence or analysis, and we do not credit this testimony. *See* 37 C.F.R. § 42.65(a); *Nobel Biocare*, 903 F.3d at 1382.

Patent Owner also argues that “Gesink’s microprocessor interprets physical movement data completely independently of the elapsed time function,” and “[a]fter the interpretation of movement data is complete, it is only then that ‘microprocessor 18 compares the elapsed time of this test to the previously entered test duration.’” Sur-reply 18 (citing Ex. 1014, 13:60–65). Thus, in Patent Owner’s view, even if Raymond’s real time clock is added to Gesink, Gesink cannot be interpreting movement data based on the real time clock. *Id.*

Patent Owner, however, misinterprets Gesink’s disclosure. Namely, Gesink discloses monitoring the individual’s *veer* at step 170, and

comparing the measured veer to the maximum veer value entered by the individual at step 172. Ex. 1014, 13:23–25, 13:53–55. If, at step 172, the measured veer does not exceed the maximum veer value, the process proceeds to step 176 where microprocessor 18 compares the elapsed test time to the preset time duration. *Id.* at 13:60–64. If the elapsed time is less than the time duration, the process returns to step 170 to continue monitoring and interpreting veer; if the elapsed time is equal to or greater than the time duration, the process proceeds to step 178 where a congratulatory message is issued. *Id.* at 13:64–14:5. Thus, instead of comparing the elapsed test time to the test duration *only after* interpretation of movement data is complete as Patent Owner contends, Gesink discloses comparing the elapsed test time and continuing to monitor and interpret the movement data *until* the elapsed time meets or exceeds the preset test duration. In this way, the interpretation is based on the clock because the elapsed time determines whether and for how long the interpretation continues.

Based on the full record before us, we determine that Petitioner has met its burden of establishing that the combination of Gesink and Raymond discloses limitation [20c].

c) Limitation [20f]

Limitation [20f] recites “storing, in said memory, first event information related to the detected first user-defined event along with first time stamp information reflecting a time at which the movement data causing the first user-defined event occurred.”

Petitioner argues that “Gesink teaches that when the microprocessor 18 detects that the individual failed the walking test because the maximum veer has been exceeded, ‘an announcement is generated informing the individual 12 that the maximum veer was exceeded *and the*

time into the test at which it was exceeded.” Pet. 84–85 (citing Ex. 1014, 13:53–59). Petitioner adds that “Gesink teaches that ‘an incremental, moment-by-moment analysis of the individual’s ambulatory movement can be obtained and recorded,’ including ‘an indication of: the time since the start of the test.’” *Id.* at 85 (citing Ex. 1014, 15:46–60). In view of these teachings, Petitioner asserts the it would have been obvious to one of ordinary skill in the art that (1) first event information related to the detected first event (i.e., the maximum veer being exceeded) is generated and stored, and (2) first time stamp information (i.e., the time into the test at which maximum veer was exceeded and the time since the start of the test associated with the moment-by-moment analysis of the individual’s ambulatory movement) reflecting a time at which the movement data causing the first user-defined event occurred. *Id.* (citing Ex. 1003 ¶ 164).

Alternatively, Petitioner argues that Raymond discloses time stamping data as it is collected and storing the data in a database where it is time-indexed for subsequent retrieval and analysis. *Id.* at 85–86 (citing Ex. 1009, code (57), 1:42–67, 2:23–30). Next, Petitioner asserts that:

In support of sustaining Gesink’s recording of a “moment-by-moment analysis of the individual’s ambulatory movement,” a [person of ordinary skill in the art] would have incorporated the timestamping of collected data and stored it in Gesink’s memory, so that the individual’s ambulatory movement (and more generally health) can be tracked and assessed “over days, months, and years.”

Id. at 86 (citing Ex. 1009, 1:42–57; Ex. 1014, 15:46–60; EX. 1003 ¶ 165).

Patent Owner argues that Gesink “simply stores the *elapsed* time at which the device noticed that the user had exceeded the maximum veer by comparing the accumulating veer register with the maximum veer value at

every iteration,” and this elapsed time is not “related to the *detected* first user-defined event.” PO Resp. 45.

Patent Owner’s argument is not persuasive. As Petitioner asserts, Gesink discloses that, when microprocessor 18 detects that the maximum veer value has been exceeded, an announcement is generated informing the individual that the maximum veer was exceeded and the time into the test at which it was exceeded. Ex. 1014, 13:55–59. This “time into the test,” even if deemed to be “elapsed time,” corresponds to when the maximum veer was exceeded and, thus, is time stamp information reflecting the time at which the movement data causing the maximum veer to be exceeded (i.e., the user-defined event) occurred. Furthermore, Gesink discloses recording the “moment-by-moment analysis of the individual’s ambulatory movement.” *Id.* at 15:46–50. This recording can include the raw, cumulative veer data and the time since the start of the test. *Id.* at 50–52. Accordingly, we are persuaded that Gesink discloses storing event information related to a detected user-defined event together with time stamp information reflecting a time at which the movement data causing the user-defined event occurred.

Based on the full record before us, we determine that Petitioner’s first argument shows that the combination of Gesink and Raymond discloses limitation [20f].

In addition, Patent Owner does not address Petitioner’s alternative argument in either the PO Response or the Sur-reply. Accordingly, we need not address Petitioner’s undisputed alternative argument that the combination of Gesink and Raymond discloses limitation [20f]. *See LG Elecs.*, 759 F. App’x at 925; *see also* 37 C.F.R. § 42.23(a) (“Any material fact not specifically denied may be considered admitted.”).

Nevertheless, we have reviewed Petitioner’s alternative argument and find that it also shows that the combination of Gesink and Raymond discloses limitation [20f].

d) The Remaining Aspects of Petitioner’s Contentions

Patent Owner does not offer any arguments specifically addressing the remaining limitations of claim 20 and, in fact, expressly indicates that it does not dispute that Gesink discloses each limitation. PO Resp. 43–44, 45. We need not set forth formal findings as to the undisputed assertions by Petitioner that the combination of Gesink and Raymond discloses or suggests these limitations. *See LG Elecs.*, 759 F. App’x at 925. Also, we cautioned Patent Owner “that any arguments not raised in the response may be deemed waived.” Paper 11, 9; *cf.* 37 C.F.R. § 42.23(a) (“Any material fact not specifically denied may be considered admitted.”). Nevertheless, we have reviewed Petitioner’s contentions with respect to the remaining limitations of claim 1 and find that the combination of Gesink and Raymond discloses these limitations as set forth by Petitioner. *See* Pet. 78–80, 84.

e) Conclusion

For the above reasons, we determine that Petitioner has shown by a preponderance of the evidence that claim 20 is unpatentable over the combination of Gesink and Raymond.

3. Dependent Claim 25

Claim 25 recites “[t]he method of claim 20 wherein said movement measuring device is an accelerometer.” Petitioner argues that “Gesink’s aid includes ‘a set of [] accelerometers 230, 232 and 234,’ each of which can measure ‘the acceleration of the learning and assessment aid along a different axis.’” Pet. 86 (citing Ex. 1014, 16:16–27, 17:20–29, Fig. 8; Ex. 1003 ¶ 167). Patent Owner indicates that it does not dispute that Gesink

discloses the subject matter introduced in claim 25 for the limited purposes of this ground. PO Resp. 46.

We have considered the evidence and arguments of record and determine that Petitioner has demonstrated by a preponderance of the evidence that claim 25 is unpatentable over the combination of Gesink and Raymond for the reasons discussed in the Petition and as supported by the testimony of Dr. Kenny.

III. CONCLUSION¹⁷

In summary:

Claims	35 U.S.C. §	Reference(s)/Basis	Claims Shown Unpatentable	Claims Not shown Unpatentable
1–5, 8– 11, 20, 25, 30, 36, 39– 42, 45– 51, 61– 63, 144, 147	103(a)	Allum, Raymond, Conlan	1–5, 8–11, 30, 36, 39–42, 45– 51, 61–63, 144, 147	20, 25
31, 32	103(a)	Allum, Raymond, Conlan, de Remer	31, 32	
64, 65	103(a)	Allum, Raymond, Conlan, Gaudet	64, 65	
20, 25	103(a)	Gesink, Raymond	20, 25	

¹⁷ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner’s attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. See 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. See 37 C.F.R. § 42.8(a)(3), (b)(2).

Overall Outcome			1–5, 8–11, 20, 25, 30, 36, 39–42, 45–51, 61–63, 144, 147	
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IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that claims 1–5, 8–11, 20, 25, 30–32, 36, 39–42, 45–51, 61–65, 144, and 147 of the '576 patent are determined to be unpatentable; and

FURTHER ORDERED that, because this is a Final Written Decision, parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

IPR2022-00037
Patent 6,059,576 C1

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