

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

KONINKLIJKE PHILIPS N.V. and PHILIPS NORTH AMERICA LLC,
Petitioner,

v.

FITBIT, INC¹.
Patent Owner.

IPR2021-00505
Patent 8,868,377 B2

Before DAVID C. McKONE, STACEY G. WHITE, and NORMAN H.
BEAMER, *Administrative Patent Judges*.

WHITE, *Administrative Patent Judge*.

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

¹ Patent Owner Fitbit, Inc. is now Fitbit LLC. *See* Paper 13.

I. INTRODUCTION

Koninklijke Philips N.V. and Philips North America LLC (collectively “Petitioner”) filed a Petition requesting *inter partes* review of claims 1–16, 25, 26, 28, and 29 (the “challenged claims”) of U.S. Patent No. 8,868,377 B2 (Ex. 1001, “the ’377 patent”). Paper 1 (“Pet.”). We instituted *inter partes* review of the challenged claims on all asserted grounds. Paper 11 (“Dec.”). After institution, Patent Owner filed a Patent Owner Response (Paper 18, “PO Resp.”), Petitioner filed a Reply (Paper 22, “Reply”), and Patent Owner filed a Sur-Reply (Paper 27, “Sur-Reply”). An oral hearing was held on May 17, 2022, and a transcript of the hearing is included in the record (Paper 33, “Tr.”).

We have jurisdiction under 35 U.S.C. § 6. This Decision is issued pursuant to 35 U.S.C. § 318(a). For the reasons that follow, we determine Petitioner has shown, by a preponderance of the evidence, that claims 1, 2, 9–11, 16, 25, and 28 of the ’377 patent are unpatentable. Petitioner has not shown by a preponderance of the evidence that claims 3–8, 12–15, 26, and 29 are unpatentable.

A. Related Matters

The parties identify the following judicial proceeding in which the ’377 patent is asserted: *Fitbit, Inc. v. Koninklijke Philips N.V. and Philips North America LLC*, No. 1:20-cv-11613-WGY (D. Mass.). Pet. 1; Paper 5, 1. The parties also identify the following matters the ’377 patent previously was involved in: *Fitbit, Inc. v. AliphCom d/b/a Jawbone*, No. 1-15-cv-00990 (D. Del.); *In re Wearable Activity Tracking Devices, Systems and Components Thereof*, 337-TA-973 (ITC); and *Fitbit, Inc. v. AliphCom*, No. 3-17-cv-01139 (N.D. Cal.). Pet. 1–2; Paper 5, 1.

B. The '377 Patent

The '377 patent is titled “Portable Monitoring Devices and Methods of Operating Same.” Ex. 1001, code (54). The '377 patent relates “to portable monitoring devices and method of operating and controlling same.” *Id.* at 1:34–35. The portable monitoring devices include an altitude sensor, motion sensor, and processing circuitry to calculate, assess, and/or determine calorie burn and/or other activity-related quantities of the user. *Id.* at 1:36–39. For example, the '377 patent states that “[i]n addition to speed based techniques, or in lieu thereof, the portable monitoring device may estimate, calculate and/or determine, calorie consumption, burn and/or expenditure using data which is representative of the intensity of user motion—for example, as provided or determined by one or more single axis or multi-axis accelerometers.” *Id.* at 12:3–8. “[T]he external processing circuitry partially or wholly calculates, assesses and/or determines the calorie burn and/or other activity-related quantities of the user.” *Id.* at 2:6–9.

Figures 1A and 1B of the '377 patent are reproduced below:

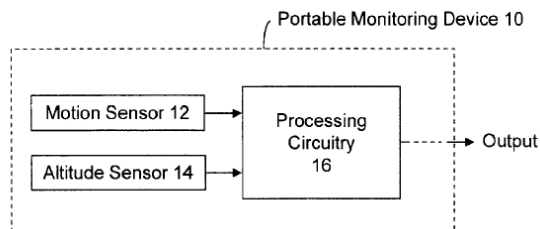


FIGURE 1A

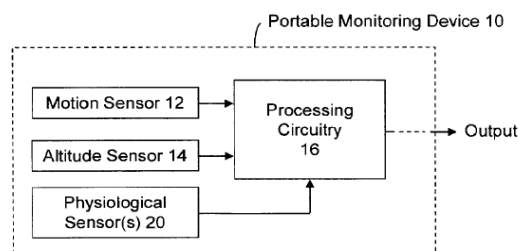


FIGURE 1B

Figures 1A and 1B “are block diagram representations of exemplary portable monitoring devices.” *Id.* at 2:38–39. The portable monitoring devices, include processing circuitry 16, one or more altitude sensors 14, one or more motion sensors 12 and, in certain embodiments, one or more physiological sensors 20, one or more mode sensors (not shown), and transmitter circuitry and/or receiver circuitry (not shown). *Id.* at 2:41–46.

C. Illustrative Claim

Petitioner challenges claims 1–16, 25, 26, 28, and 29, with claims 1, 10, and 25 being independent. Independent claim 1 is illustrative of the challenged claims and is reproduced below:

1. A portable activity monitoring device to calculate activity points corresponding to physical activities of a user, the portable activity monitoring device comprising:

a housing having a physical size and shape that is adapted to couple to the body of the user;

a plurality of sensors, disposed in the housing, to generate sensor data which is representative of activity of the user, wherein the plurality of sensors includes at least three accelerometers;

processing circuitry, disposed in the housing and electrically coupled to the plurality of sensors, to:

calculate the activity points of the user using the sensor data, wherein the activity points correlate to an amount of one or more physical activities of the user; and

a display, coupled to the processing circuitry, to output the data which is representative of the activity points to the user.

Ex. 1001, 43:28–45.

D. Asserted Grounds of Unpatentability

Petitioner, with support from testimony of Dr. Darrin J. Young (Ex. 1002 (First Declaration); Ex. 1044 (Second Declaration)), challenges

the patentability of claims 1–16, 25, 26, 28, 29 of the '377 patent as follows (see Pet. 3–4):

Claim(s) Challenged	35 U.S.C. §²	Reference(s)/Basis³
1, 2, 9–11, 16, 25, 28	§ 102	Kroll ⁴
1, 2, 9, 25, 28	§ 102	Damen ⁵
10, 11, 16	§ 103	Damen, Kroll
1–4, 7–11, 16, 25, 28	§ 102	Kateraas ⁶
1–16, 25, 26, 28, 29	§ 103	Kateraas, Kahn ⁷

² The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), included amendments to 35 U.S.C. §§ 102 and 103 that became effective after the filing of the application for the '377 patent. Therefore, we apply the pre-AIA versions of these sections.

³ Petitioner makes arguments regarding the priority date for the challenged claims. Pet. 13–14. The earliest application listed on the face of the '377 was filed September 30, 2010. Ex. 1001, code (60). The asserted prior art dates for each of the references in the Petition are prior to that date, and thus, we need not reach Petitioner’s arguments regarding the '377 patent’s priority date. *See also* PO Resp. 1–2 (not acquiescing to Petitioner’s assertions regarding priority date but stating that priority date need not be addressed because of the dates of Petitioner’s asserted references).

⁴ U.S. Pat. Application Pub. No. 2010/0079291 A1 (Ex. 1004, “Kroll”).

⁵ PCT Pub. No. WO 02/091923 A1 (Ex. 1006, “Damen”).

⁶ PCT Pub. No. WO 2009/140360 A1 (Ex. 1008, “Kateraas”).

⁷ U.S. Pat. No. 7,690,556 B1 (Ex. 1010, “Kahn”).

II. ANALYSIS

A. Level of Ordinary Skill in the Art

To determine whether an invention would have been obvious at the time it was made, we consider the level of ordinary skill in the pertinent art at the time of the invention. *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966). The resolution of this question is important because it allows us to “maintain[] objectivity in the obviousness inquiry.” *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718 (Fed. Cir. 1991). In assessing the level of ordinary skill in the art, various factors may be considered, including the “type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field.” *In re GPAC, Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (quotation omitted). Generally, it is easier to establish obviousness under a higher level of ordinary skill in the art. *Innovation Toys, LLC v. MGA Entm’t, Inc.*, 637 F.3d 1314, 1323 (Fed. Cir. 2011) (“A less sophisticated level of skill generally favors a determination of nonobviousness . . . while a higher level of skill favors the reverse.”).

Petitioner asserts that a person of ordinary skill in the art at the time of the alleged invention of the ’377 patent “would have at least a Bachelor’s Degree in an academic area emphasizing electrical engineering, computer science, or a similar discipline, and at least two years of experience in personal monitoring systems. Superior education could compensate for a deficiency in work experience, and vice-versa.” Pet. 9 (citing Ex. 1002 ¶¶ 92–93). Patent Owner’s proposed level of ordinary skill is similar with Patent Owner contending that the ordinary skilled artisan “would have had a

bachelor's degree in computer science, software engineering, electrical engineering, or the equivalent and at least two years of experience in the relevant field, e.g., personal monitoring systems and processes. More education can supplement practical experience and vice versa.” PO Resp. 2–3 (citing Ex. 2001 ¶¶ 15–18).

In the Institution Decision, we adopted Petitioner's assessment of the level of skill in the art, with the exception of the open-ended phrase “at least,” which expands the range of experience indefinitely without an upper bound. Dec. 7. Neither party provides substantive argument as to why its proposed level of skill is correct. Pet. 9; PO Resp. 2–3. We, however, are not persuaded that there is a material difference between the parties' proposals.

Based on this record, we apply the level of skill laid out in our Institution Decision (omitting the open-ended phrases “at least”) because it is consistent with the level of ordinary skill in the art at the time of the invention as reflected in the prior art of record. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001). Accordingly, we find for the purpose of this Decision and based on the record before us, that a person of ordinary skill in the art at the relevant time would have a Bachelor's Degree in an academic area emphasizing electrical engineering, computer science, or a similar discipline, and two years of experience in personal monitoring systems. We note, however, that our determinations on patentability would not change if we accepted Patent Owner's proposed level of skill.

B. Claim Construction

1. *Background*

In an *inter partes* review proceeding, a patent claim shall be construed using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. § 282(b). 37 C.F.R.

§ 42.100(b) (as amended Oct. 11, 2018). This rule adopts the same claim construction standard used by Article III federal courts, which follow *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc), and its progeny. Under this standard, the words of a claim are generally given their “ordinary and customary meaning,” which is the meaning the term would have to a person of ordinary skill at the time of the invention, in the context of the entire patent including the specification. *See Phillips*, 415 F.3d at 1312–13.

In our Institution Decision, we discerned a need to construe the term “activity points.” Dec. 8–11. There, we determined for the purposes of that Decision that “activity points” is broad enough to “include[] measures such as steps taken by the user, number of minutes the user has been active, or measures of energy expenditure such as a number of calories burned.” *Id.* at 11 (alteration in original). Patent Owner asserts that “the Board need not expressly construe this term to confirm the patentability of the challenged claims.” PO Resp. 4. Patent Owner, however, does not point out any error in our construction and based upon our review of the record, we are persuaded that our prior construction is correct and maintain our prior findings regarding the proper construction of activity points. Dec. 8–11. No other terms require express construction at this time. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir.

2017) (noting that “we need only construe terms ‘that are in controversy, and only to the extent necessary to resolve the controversy’”).

C. Anticipation by Kroll

Petitioner asserts that claims 1–2, 9–11, 16, 25, and 28 are unpatentable under § 102 as anticipated by Kroll, citing the Declaration of Dr. Darrin Young for support. Pet. 14–28.

1. Kroll

Kroll describes a weight management system comprised of a body worn device which interfaces periodically with a computer. Ex. 1004, code (57). Kroll’s system provides “unprecedented accuracy in personal calibration of the activity monitoring device to the individual,” and describes multiple techniques for calibrating the body worn activity monitoring device to correlate detected activity with the calorie expenditure of a specific user. *Id.* ¶ 42. The body worn activity monitoring device includes a CPU and one or more tri-axial accelerometers for monitoring physical activity. *Id.* ¶¶ 16, 85.

Figure 7 shows Kroll’s body worn activity monitoring device and is reproduced below:

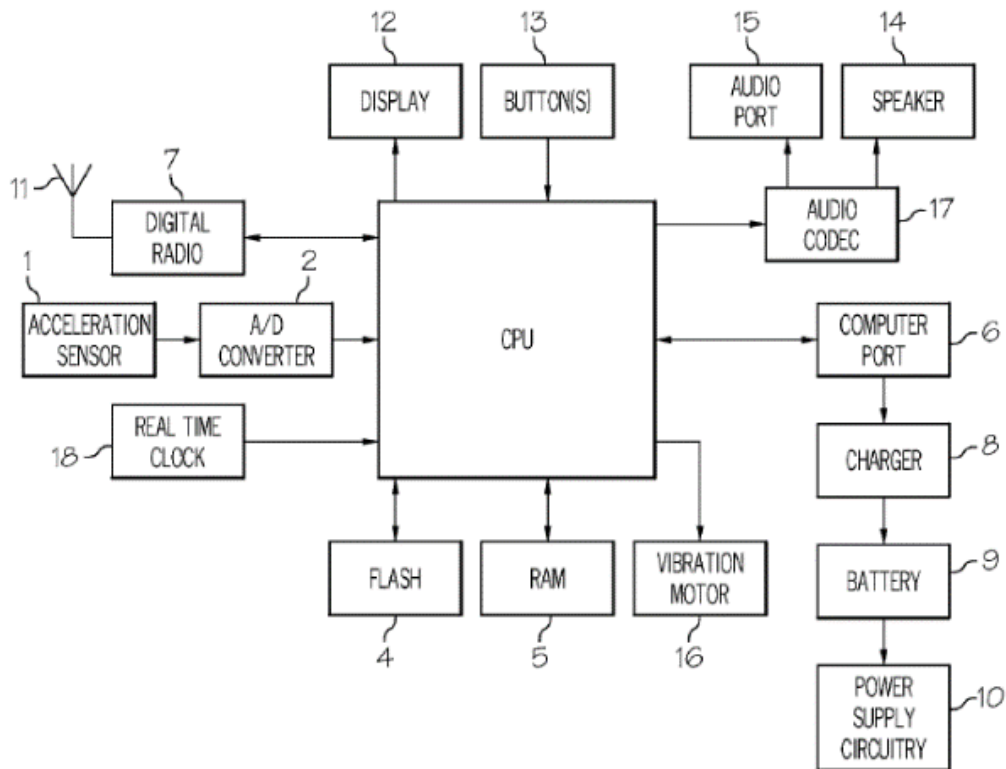
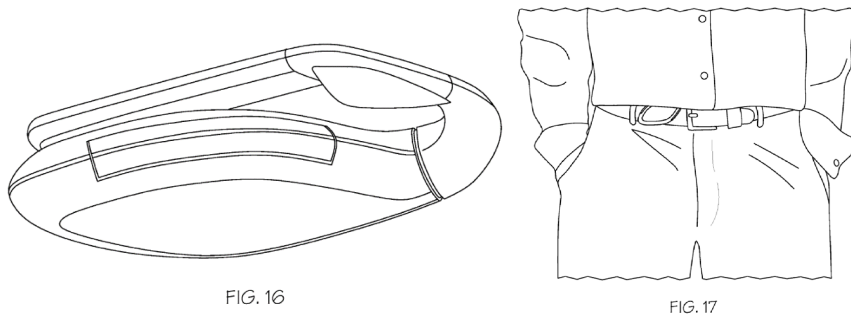


FIG. 7

Figure 7, reproduced above, is a block diagram of an embodiment of the body worn activity monitoring device and each of the components is contained within a portable housing. *Id.* ¶¶ 27, 85. Accelerometer 1 detects user body movement in two or more axes. *Ex.* 1004 ¶ 85. Using a tri-axial accelerometer, the present invention detects motion in the X, Y, and Z axes. *Id.* The output of the accelerometer can be an analog voltage, which can be read by the CPU. *Id.* The CPU processes the signal received from the accelerometer to determine a user's posture, a step count, or a composite acceleration that corresponds to an acceleration unit, also referred to as an activity unit. *Id.* ¶¶ 89, 91, 95–96. Display 12 may include a multicolor indicator that signals daily activity progress periodically or on demand when

the user presses button 13. *Id.* ¶¶ 87, 91. “The device’s display can present information such as total expended calories and activity intensities alphanumerically, graphically, or both.” *Id.* ¶ 87.

Figures 16 illustrates the body worn activity monitoring device and is reproduced below along with Figure 17 that illustrates a person wearing the activity monitoring device depicted in Figure 16.



Figures 16 and 17, reproduced above, depict various views of Kroll’s body worn device. *Id.* ¶ 86.

2. Independent Claims 1, 10, and 25

Petitioner asserts that independent claim 1 is anticipated by Kroll. Pet. 14. Petitioner relies on its discussion of claim 1 (*id.* at 14–24) for much of its analysis of the limitations of claims 10 and 25. *Id.* at 24–25, 27–28. Claims 1, 10, and 25 are substantially similar and for efficiency purposes we discuss the limitations of these claims together.

According to Petitioner, Kroll discloses “[a] portable activity monitoring device to calculate activity points corresponding to physical activities of a user, the portable activity monitoring device comprising.” *Id.* at 18. Petitioner explains that Kroll discloses a portable monitoring device that is configured to be worn on the body of a user as the user engages in a physical activity. *Id.* Petitioner asserts that the recited “a housing having a physical size and shape that is adapted to couple to the body of the user” is

disclosed by Kroll. *Id.* at 19. Petitioner explains figure 17 of Kroll shows the device being worn on the belt of the user. *Id.*

Petitioner contends that Kroll discloses “a plurality of sensors, disposed in the housing, to generate sensor data which is representative of activity of the user, wherein the plurality of sensors includes at least three accelerometers.” *Id.* Petitioner explains that in Kroll “[s]ome embodiments of the present invention detect motion in the X, Y, and Z axes using a tri-axial accelerometer.” *Id.* at 20 (citing Ex. 1004 ¶ 85) (alternation in original). Petitioner also explains that one of ordinary skill in the art would have recognized that a “tri-axial accelerometer” includes sensor elements positioned to detect motion in three axes. *Id.* Petitioner points to Kroll’s accelerometer 7, which outputs analog voltages proportional to accelerations, which are converted to a digital representation by analog to digital converter 2 and can be read by the CPU. *Id.* Also, Petitioner states that Kroll discloses that the CPU processes the signals received from acceleration sensor 1 to determine a user’s posture, step count, or composite acceleration. *Id.* Thus, Petitioner contends that the acceleration data received by the CPU from the acceleration sensors are representative of physical activity of the user. *Id.* at 21. Petitioner explains because acceleration sensor 1 is configured to detect the movement of the user, it is evident that sensor 1 is contained in the housing that is worn by the user. *Id.* In the context of claim 10, Petitioner further asserts that “the data from sensor 1 is representative of movement, including ambulatory activity” and here, Petitioner specifically directs us to Kroll’s disclosure of the CPU determining steps from the Z axis sensor and the acceleration vector. *Id.* at 25 (citing Ex. 1004 ¶¶ 77–78).

Patent Owner disputes Petitioner's contentions regarding "a plurality of sensors, disposed in the housing, to generate sensor data which is representative of activity of the user, wherein the plurality of sensors includes at least three accelerometers." PO Resp. 12–26. Patent Owner asserts that the "claimed 'sensor[]' is not an individual sensing instrument, but a module that includes one or more sensing instruments, collectively generating data for a particular purpose." *Id.* at 7 (alteration in original). "Thus, in the context of the '377 patent, the claimed 'plurality of sensors' encompasses multiple different types of sensors, such as altitude sensors, motion sensors, physiological sensors, and/or mode sensors, as described in the '377 patent." *Id.* at 8 (citing Ex. 2001 ¶ 30). In support of its argument, Patent Owner directs us to several of the dependent claims including claim 3, which recites, in relevant part "wherein the plurality of sensors [of claim 1] includes two or more of a motion sensor, an altitude sensor and a physiological sensor." *Id.* (emphasis omitted); Ex. 1001, 43:50–52. Patent Owner points out that "[t]he '377 patent further explains that a single 'motion sensor' may include 'one or more *single axis or multi-axis accelerometers*." PO Resp. 10 (citing Ex. 1001, 12:3–12.) Thus, in Patent Owner's view the acceleration sensor of Kroll discloses a single sensor and does not constitute a plurality of sensors.

Petitioner responds that Patent Owner's assertion that the claims require "sensing modules" and not just sensors is vague and that neither Patent Owner nor its expert are able to articulate what qualifies as a module. Reply 2–3. Further, Petitioner contends that the Specification describes an exemplary motion sensor as having "*one* or more accelerometers." *Id.* at 3–4 (citing Ex. 1001, 3:6–10, 7:37–46, 11:7–12, 13:66–14:3, 33:41–43, 39:39–

42). Petitioner also argues that Patent Owner’s position that even “**multiple** tri-axial accelerometers” cannot constitute the claim plurality of sensors is “[i]nexplicabl[e].” *Id.* at 5–6.

We find Petitioner’s arguments to be persuasive. The ’377 states that its device may “include one or more motion sensors.” Ex. 1001, 2:52–53. The subject patent further notes that “exemplary motion sensors which include, for example, one or more accelerometers.” *Id.* at 3:6–8. Indeed, Patent Owner points out that its “PO’s Response explained how the specification of the ’377 patent makes clear that a single claimed ‘sensor’ may include **one** or more sensing instruments.” Sur-Reply 2 (citing PO Resp. 7–12) (emphasis added). We find that the ’377 patent claims are not limited to a configuration in which multiple accelerometers would compose a single motion sensor. The ’377 patent specification explains that motion sensors may have one accelerometer and that the claimed device may have more than one motion sensor. *See* Ex. 1001, 2:38–46, 3:6–9. In addition, we are not persuaded that claim 1 requires “multiple different types of sensors.” *See* PO Resp. 8. While it is true that dependent claims 3–7 require specific types of sensors this does not limit the scope of the independent claims. Claims 1 and 25 recite that the plurality of sensors “generate sensor data which is representative of activity of the user.” Ex. 1001, 43:33–34, 46:3–4. Claim 10 recites that the plurality of sensors “generate sensor data which is representative of ambulatory activities of the user.” *Id.* at 44:10–12. As such, we are persuaded that the claim language allows the use of any set of sensors that generates the requisite data (and includes the requisite “at least” one tri-axial accelerometer or three accelerometers as will be discussed below).

In accord with its above arguments, Patent Owner asserts that a person of ordinary skill in the art would have understood “Kroll’s acceleration sensor (1), comprising a single tri-axial accelerometer, to constitute a single ‘sensor[]’ and not a ‘plurality of sensors,’ as claimed.” PO Resp. 14 (citing Ex. 2001 ¶ 39) (alteration in original). As discussed above, however, we are not persuaded that the independent claims would exclude a tri-axial accelerometer from the scope of the recited “plurality of sensors.”

We also are persuaded that Kroll’s disclosure of a tri-axial accelerometer discloses the recited three accelerometers. Dr. Young supports Petitioner by opining that “it was known to use *three uniaxial accelerometers* mounted orthogonally to measure acceleration values in three axes.” Ex. 1002 ¶ 39 (emphasis added). He cites a 1997 paper to support his opinion, which discussed the use of “three uniaxial piezoresistive accelerometers . . . [to] measure motion occurring in any of three directions.” *Id.* (citing Ex. 1034, 138); *see also id.* ¶¶ 40–41 (providing additional examples).

Patent Owner contends that while tri-axial accelerometers generally are composed of three accelerometers this “is not necessarily always the case. Indeed, a [person of ordinary skill in the art] would have understood at the time that a tri-axial accelerometer could have been designed to detect three different axes without use of three individual single axis accelerometers.” PO Resp. 15. Patent Owner’s declarant, Dr. Majid Sarrafzadeh supports Patent Owner’s contention by describing a tri-axial accelerometer with “monolithic single proof mass designs that sense in all three directions.” Ex. 2001 ¶ 41 (citing Ex. 2005, 2, 18). Petitioner responds by explaining, with the support of testimony from Dr. Young, that

“[i]n single-proof designs, the various accelerometers share a common proof mass for a more compact arrangement (as compared with designs that used one mass for each accelerometer).” Reply 14 (citing Ex. 1044 ¶¶ 20–25). Petitioner further explains that in this single proof mass configuration “different pairs of electrodes form their own accelerometers (for each axis), with their own individual outputs.” *Id.* at 14–15. As such, Petitioner contends that “even single-proof-mass designs use multiple accelerometers with different outputs.” *Id.* at 15. We are persuaded that Petitioner and Dr. Young provide sufficient evidence to show that a tri-axial accelerometer such as the one disclosed in Kroll would have been composed of at least three accelerometers. Thus, based on the record before us, we are persuaded that Kroll’s disclosure of a tri-axial accelerometer is sufficient to disclose the recited three accelerometers.

We also find unpersuasive Patent Owner’s argument that Petitioner is relying on the same element for two different claim limitations. *See* PO Resp. 18. The limitation at issue is “a plurality of sensors, disposed in the housing, to generate sensor data which is representative of activity of the user, wherein the plurality of sensors includes at least three accelerometers⁸.” Ex. 1001, 43:33–36. Thus, based on the claim language, the plurality of sensors includes at least three accelerometers. Therefore, these are not separate and distinct limitations, but rather the “include” language adds specificity to the “plurality of sensors.” We are not persuaded

⁸ Claim 10 differs from claims 1 and 25 in that it requires at least one sensor which includes a tri-axial accelerometer. We are persuaded that Petitioner’s argument that Kroll’s tri-axial accelerometer would disclose this limitation. *See* Pet. 25.

that the plurality of sensors requires more sensors than the recited “at least three accelerometers.” As such, we see no error in Petitioner directing us to a tri-axial accelerometer that includes three accelerometers. For all of the foregoing reasons, we determine that Kroll discloses this limitation.

As an additional finding we note that Kroll discloses the use of multiple tri-axial accelerometers which also discloses this limitation. We are not persuaded by Patent Owner’s argument that it is improper for us to consider Kroll’s disclosure of using multiple tri-axial accelerometers. *See* PO Resp. 19–26. According to Patent Owner, “Petitioners never alleged that this limitation is disclosed by more than one tri-axial accelerometer, and the portions of Kroll relied upon by the Board were never cited by Petitioners in their claim analysis.” *Id.* at 23 (emphasis omitted). In the Institution Decision, we stated that “Kroll’s disclosure that its device comprises ‘one or more tri-axial accelerometers for monitoring physical activity’” also meets this limitation. Dec. 16 (citing Pet. 15; Ex. 1004 ¶ 16) (emphasis omitted). We also quoted the relevant language from Kroll which described “one or more tri-axial accelerometers for monitoring physical activity.” *Id.* (quoting Ex. 1004 ¶ 16). Patent Owner cites to our rule against raising new issues on reply in support of its argument that this evidence may not properly be considered. PO Resp. 23 (citing 84 Fed. Reg. 64,280 (Nov. 21, 2019); Consolidated Trial Practice Guide at 74–75 (Nov. 2019)).

In the Petition, we were presented with a description of Kroll that indicated that Kroll disclosed the use of multiple tri-axial accelerometers. Pet. 15. In the Institution Decision, we found this disclosure of multiple tri-axial accelerometers to be an additional disclosure that further supported Petitioner’s assertion that the challenged claims were anticipated by Kroll.

Dec. 16. Patent Owner presented us with its arguments as to why it believes that Kroll's disclosure of multiple tri-axial accelerometers is insufficient to disclose the recited plurality of sensors. PO Resp. 24–26. Specifically, Patent Owner argues that “multiple tri-axial accelerometers can be configured in manners that only constitute a single motion sensor in the context of the '377 patent.” *Id.* at 25. For similar reasons as those discussed above in regards to Kroll's disclosure of a tri-axial accelerometer, we are not persuaded that multiple tri-axial accelerometers would constitute a single sensor. Petitioner presented us with arguments that Kroll's disclosure of multiple tri-axial accelerometers was properly considered at the Institution stage and is properly before us as rebuttal evidence to counter Patent's Owner's argument that the accelerometers disclosed in Kroll are insufficient to anticipate the challenged claims. Reply 15–18.

Here, Petitioner asserts that its “background [description of Kroll] is part of the overall analysis” and even though it was not discussed in connection with a particular claim, “it was in the Petition as a disclosure being relied upon.” Tr. 23:11–14; *see also* Reply 15 (noting that “the Petition used that very language from Kroll—‘one or more triaxial accelerometers for monitoring physical activity.’”). The Petition described Kroll as disclosing multiple tri-axial accelerometers. Pet. 15. The Institution Decision noted Petitioner's assertion that Kroll discloses the use of “one or more tri-axial accelerometers for monitoring physical activity” and cited to where that exact language was found in the reference. Dec. 16; *see also* Ex. 1004 ¶ 16 (stating three times that Kroll's device has “one or more tri-axial accelerometers”). Patent Owner had the opportunity to respond to Petitioner's assertion and did in fact respond substantively to the

assertion that Kroll discloses multiple tri-axial accelerometers. PO Resp. 24–26; *see also* Reply 15 (noting that Patent Owner had a full opportunity to respond to this evidence) (citing *Nike, Inc. v. Adidas AG*, 955 F.3d 45, 53 (Fed. Cir. 2020)). Petitioner also provided arguments in Reply regarding the use of multiple tri-axial accelerometers. Reply 15–16. Petitioner further asserts that the discussion of multiple tri-axial accelerometers is also “proper reply to Fitbit’s arguments concerning what may constitute plural sensors.” *Id.* at 15. Petitioner persuasively argues that “Kroll makes clear that the multiple tri-axial accelerometers apply to the various embodiments” and as such, may be properly considered as part of the anticipation ground. *Id.* at 16. We find Petitioner’s arguments to be persuasive and therefore, we find that Kroll also disclosed the use of multiple tri-axial accelerometers and this disclosure is an additional finding that supports Petitioner’s argument that the recited plurality of sensors would have been disclosed by Kroll.

Petitioner asserts that Kroll discloses “processing circuitry, disposed in the housing and electrically coupled to the plurality of sensors.” Pet. 21. Petitioner explains that each embodiment of Figures 7–10 includes a CPU that is coupled to acceleration sensor 1. *Id.* Petitioner also explains the CPU is disposed in the housing device that is worn by a user. *Id.*

As to claim 1’s requirement to “calculate the activity points of the user using the sensor data, wherein the activity points correlate to an amount of one or more physical activities of the user,” Petitioner directs us to the disclosures of Kroll. *Id.* at 22. Petitioner asserts that Kroll’s CPU determines body posture, counts steps by the user, and determines a composite acceleration that is proportional to the calorie expenditure of the user. *Id.* Petitioner contends that in Kroll the term “acceleration units” is

synonymous with the term “activity units” and states that activity units are used to clarify a user’s speed or activity. *Id.* Petitioner argues that “[a]ccordingly, activity units/acceleration units, step count, and calories burned, as calculated by Kroll’s device, are all examples of ‘activity points’ that are calculated based on accelerometer sensor data, particularly where that term is construed more broadly.” *Id.* at 23. As to claim 10, Petitioner further contends that “Kroll states that ‘[t]he device’s display can present information such as total expended calories and activity intensities alphanumerically, graphically, or both.’” *Id.* at 26 (citing Ex. 1004 ¶ 87) (alternation in original). Further “a greater calorie burn may correspond to physical activity over a period of time. More activity or the same amount of activity over a shorter period of time correlates to an intensity of the activity of the user.” *Id.* (citing Ex. 1002 ¶ 192).

According to Patent Owner,

neither Petitioners nor their expert provide any analysis or evidence as to how Kroll’s activity units/acceleration units or step count discloses the claimed “activity points” of claims 10 and 25, which unlike the “activity points” of claim 1, requires that the “activity points correlate to an **amount and intensity** of the physical activity of the user.”

PO Resp. 40. Patent Owner contends that Kroll’s acceleration unit or activity unit “measures the rate of change of the velocity of the user, and is solely dependent on (1) change in velocity over (2) a period of time.” *Id.* at 41 (Citing Ex. 2001 ¶ 60). In addition, “Kroll’s **step count** does not correlate to the intensity of physical activity, and thus does not disclose the claimed ‘activity points’ in claims 10 and 25.” *Id.* at 42. Patent Owner further argues that Kroll discloses displaying both total expended calories

and activity intensity and thus, the total calories is something different from intensity. *Id.* at 43 (citing Ex. 1004 ¶ 87).

In response, Petitioner argues that “[c]alorie expenditure ‘correlates’ to both an amount and intensity of physical activity.” Reply 9. Specifically, Petitioner asserts that if the amount of time is held constant then the calorie expenditure will reflect the intensity. *Id.* at 10. For example, high intensity running will burn more calories than low intensity walking when performed for the same amount of time. *See id.* “Similarly, holding intensity constant and adjusting the exercise amount also changes calorie expenditure.” *Id.* (citing Ex. 1044 ¶¶ 27–30). Dr. Young supports Petitioner by opining that “the composite acceleration referred to in Kroll represents an overall output of the accelerometers (the resultant vector acceleration), which is neither a user’s velocity nor the rate of change of a user’s velocity.” Ex. 1044 ¶ 36. Rather, “[t]he composite acceleration, which is itself used to determine calorie expenditure, correlates to both an intensity and amount of exercise.” *Id.* ¶ 37.

In Sur-Reply, Patent Owner counters that Kroll’s “calories per unit time” correlates only to intensity and does not reflect the amount of exercise. Sur-Reply 17. According to Patent Owner, “[w]here calorie expenditure measures the **amount** of energy expended (e.g., due to physical activity), calorie expenditure over time measures the rate (i.e., **intensity**) of energy expenditure per unit time.” *Id.* at 10–11. Further Kroll’s composite acceleration does not reflect intensity of exercise. *Id.* at 17–18. Finally, Patent Owner argues that Dr. Young’s testimony as to the limitation is not properly supported. *Id.* at 18–19.

We are persuaded by Petitioner’s assertions. Claims 10 and 25 recite activity points that correspond to both the amount and intensity of the physical activity. Kroll calculates and displays “total expended calories and activity intensities.” Ex. 1004 ¶ 87. Kroll’s

device indicates daily progress based on the percentages of accumulated composite acceleration. In addition to accumulated values, accelerations/calories and steps are stored in memory on a periodic basis to offer the user a review of the day(s) activities: which periods the user was active, which periods the user was sedentary and the activity intensity levels during those periods.

Id. ¶ 89. Patent Owner appears to agree that total expended calories would indicate the amount of exercise. *See* Sur-Reply 10–11. The remaining question is whether Kroll discloses the intensity as well. Kroll states that the “composite acceleration” is “proportional to the calorie expenditure of the user.” Ex. 1004 ¶ 89. Dr. Young persuasively explains that the proportion here relates the amount of exercise to the intensity of exercise. Ex. 1044 ¶ 37. Dr. Young opines that the proportion here is used to show the relationship between the activity of a slow walking user and a runner. *Id.* Thus, the “composite acceleration correlates to both the amount and intensity of the activity.” *Id.*

Petitioner asserts that that recited “display, coupled to the processing circuitry, to output the data which is representative of the activity points to the user,” is disclosed by Kroll. Pet. 23. Petitioner contends that Kroll discloses that the display is coupled to the CPU and describes ways its device displays data that are representative of user activity points. *Id.*

Patent Owner contends that Petitioner’s arguments are deficient because Petitioner relies on multiple embodiments of Kroll without

explaining how those embodiments are related. PO Resp. 52. Patent Owner explains that Petitioner’s mapping is unclear as to what element in which embodiment Petitioner maps to the claimed “processing circuitry” that “calculate[s]” the “activity points,” and to the claimed display that must “[be] coupled to the processing circuitry” and “output the data [] representative of the activity points.” *Id.* at 53 (alterations in original). Patent Owner asserts that Petitioner relies on features in Kroll which relate to the Figure 7 embodiment and that Petitioner relies on Kroll’s disclosure relating to a Figure 10 embodiment. *Id.* at 54. Patent Owner argues that Petitioner does not explain how the separate Figure 7 and Figure 10 embodiments are related in a way that makes clear what components and functionalities across these different embodiments map to the claimed “processing circuitry” that is required to “calculate the activity points.” *Id.* at 55.

In the Institution Decision, our preliminary finding was that Kroll’s discussion of a CPU does not implicate multiple, distinct teachings, but rather a singular teaching of a CPU that is present in all of Kroll’s embodiments. For example, Kroll describes Figures 7–10 as variations of Kroll’s body worn device that highlight optional modifications of the device. Ex. 100[4] ¶¶ 90–91. Figure 8 is an alternative of Figure 7 that “includes a non-rechargeable, user replaceable battery (9) [and] the charger circuit of FIG. 7 is no longer present.” *Id.* ¶ 90. Kroll, thus, indicates that Figures 7 and 8 have differences as to power source, but we see no indication that the CPU is different.⁹

⁹ We note that in paragraphs 85 and 91 the CPU is referred to as “CPU(3)” in the context of Figures 7 and 10. Figures 7–10, however, contain no numbered element “3” and the CPU bears no element number. In addition, paragraph 88 refers to “CPU (1).” Element 1, however, is “Acceleration

Dec. 19. Patent Owner argues, however, that a person of ordinary skill in the art “would have recognized that the CPU in the Figure 10 embodiment would be modified and configured differently from the CPU used in the Figures 7–9 embodiment.” PO Resp. 59 (citing Ex. 2001 ¶ 98).

Dr. Sarrafzadeh supports this assertion by opining that

the Figure 10 configuration does not provide for any local calculation of calories, which the CPU would participate in performing for the local calculations described for the Figure 7 configuration. A person of ordinary skill in the art would have thus understood the software, firmware, and/or hardware associated with the CPU for the Figure 10 configuration would differ, and operate differently, than the CPU for the Figure 7 configuration.

Ex. 2001 ¶ 99. Petitioner responds that “Kroll refers to these figures jointly and explains that Fig. 10 simply shows the ‘audio and radio functions have been removed.’” Reply 17 (citing Ex. 1004 ¶¶ 91, 94 (“clock (18) of FIGS. 7–10”).

We note that Figure 7 is described as “at least one embodiment of a body worn device for monitoring physical activity and reporting calorie burn information.” Ex. 1004 ¶ 85. Figure 8 is described as “an alternative embodiment of the body worn device of FIG. 7 . . . [that] includes a non-rechargeable, user replaceable battery (9).” *Id.* ¶ 90. Figure 9 “illustrates a device with the audio capability removed.” *Id.* Finally, “[a]nother embodiment of the body worn device is shown in FIG. 10. In the device of

Sensor 1.” Ex. 1004, Figs. 7–10. Paragraph 88 also refers to “RAM (12) or Flash (13),” however the only RAM depicted is element 5 and the only flash depicted is element 4. *Id.* at Figs. 7–10. Elements 12 and 13 are depicted as Display 12 and Buttons 13. *Id.* We are persuaded that these element numbers are typographical errors and as such, the element numbers do not indicate that Kroll contemplated the use of different CPUs.

FIG. 10, the audio and radio functions have been removed.” *Id.* ¶ 91. Thus, it appears that each of Figures 8–10 is derived from Figure 7. *See id.* ¶ 39 (“For the purposes of this disclosure, like reference numerals in the figures shall refer to like features unless otherwise indicated.”); *compare* Fig. 7 with Fig. 8 (same elements with the exception of charger (8)); *compare* Fig. 7 with Fig. 9 (same elements with the exception of speaker (14), audio port (15), and audio codec (17)); *compare* Fig. 7 with Fig. 10 (same elements with the exception of digital radio (7), speaker (14), audio port (15), and audio codec (17)). We see no indication in the text that these embodiments are anything other than closely related. We are persuaded that the CPUs of the embodiments are the same. The Patentee described the specific differences between the embodiments and did not indicate that there was any difference between the CPUs.

We are not persuaded by Patent Owner’s arguments that the supporting text of Figure 10 would indicate that a different CPU would be required from that of Figure 7. Paragraph 89 of Kroll states that “[c]alories can be locally calculated on the device or externally by a retrieval device.” Paragraph 91 of Kroll states that “movements are processed by the device as acceleration units without converting them locally to calories.” Thus, both paragraphs provide for the non-local calculation of calories. As such, we are not persuaded by Dr. Sarrafzadeh’s testimony that the text of Kroll indicates that the CPUs would be different.

Similarly, Patent Owner argues that the CPU of Figures 7 and 10 must be different because the embodiment in Figure 7 “may” perform data retrieval via digital radio (7) and there is no radio in Figure 10. PO Resp. 61; Ex. 1004 ¶ 85. Figure 7, however, is described as performing data

retrieval either through digital radio (7) or computer port (6) and both Figures 7 and 10 contain computer port (6) so here again we are not persuaded that the text requires different CPUs for these embodiments. *See* Ex. 1004 ¶ 85, Fig. 7, Fig. 10. Thus, we continue to understand Kroll to be providing a singular teaching of a CPU that is a basic building block of Kroll's device and that Kroll did not vary its CPU in its discussion of embodiments and alternative designs. Therefore, there is no issue of mixing embodiments because the same CPU is found in every embodiment of Kroll.

Petitioner relies upon Kroll's CPU to disclose the recited "processing circuitry." Pet. 21. As discussed above, we are persuaded that Kroll provides a singular teaching as to the CPU and as such there is no improper mixing of disclosures from differing embodiments. As to the display, Petitioner directs us to paragraph 87, which states "[t]he device's display can present information such as total expended calories and activity intensities alphanumerically, graphically, or both. Progress toward a daily activity or calorie burn goal can be presented to the user on such a display or simple indicator lights." Ex. 1004 ¶ 87 (cited at Pet. 23). In addition, each of Figures 7–10 depicts a CPU coupled to a display. *Id.* at Figs. 7–10.

Patent Owner also disputes Petitioner's argument that Kroll discloses a display that "output[s]" the data which is representative of the activity points that correlate to an amount and intensity of the physical activity of the user. PO Resp. 57 (alteration in original). Patent Owner argues that Petitioner does not make specific arguments as to these limitations of claims 10 and 25, but rather relies on the arguments made as to claim 1 without reference to the differences between claims 1, 10, and 25. *Id.* The difference here is not in the language of this limitation, but in an earlier

limitation that recites the activity points. The activity points of claim 1 “correlate to an amount of one or more physical activities.” The activity points of claims 10 and 25 “correlate to an amount and intensity of the physical activity.” Here, Petitioner points to Kroll’s CPU and states it calculates calorie burn values that are based on an amount and an intensity of the physical activity of the user. Pet. 26. As such, the argument for claim 1 expressly includes the amount and intensity and thus, we are not persuaded that the argument failed to address all limitations of claims 10 and 25.

Petitioner explains that Kroll’s device’s display can present information such as total expended calories and activity intensities alphanumerically, graphically, or both. *Id.* Petitioner also explains that a greater calorie burn may correspond to physical activity over a period of time and more activity or the same amount of activity over a shorter period of time correlates to an intensity of the activity of the user. *Id.* Thus, physical activity over a period of time is sufficient to disclose an amount and intensity of the physical activity of the user.

For all of the foregoing reasons, we are persuaded that Petitioner has established by a preponderance of the evidence that claims 1, 10, and 25 are unpatentable under § 102 as anticipated by Kroll.

3. *Dependent Claims 2, 9, 11, 16, and 28*

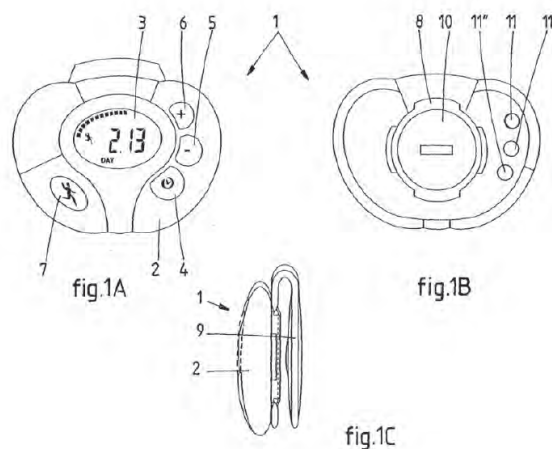
Petitioner further asserts claims 2, 9, 11, 16, and 28 are anticipated by Kroll. Pet. 24–28. Beyond the arguments addressed above, Patent Owner does not challenge Petitioner’s substantive anticipation case in its Patent Owner Response. *See generally* PO Resp. We have reviewed Petitioner’s contentions with respect to claims 2, 9, 11, 16, and 28 and determine that

Petitioner has established by a preponderance of the evidence that Kroll anticipates these claims.

D. Anticipation by Damen

1. Damen

Damen is directed to a “portable activity device comprising a housing, a display, a storage medium, at least one acceleration sensor, means for calculating an activity parameter based on the signal generated by the acceleration sensor, storing the calculated parameter in the storage medium, and showing the same in the display.” Ex. 1006, 1:1–6. Damen’s device informs a user on how to increase physical activity and displays total consumed calories. *Id.* at 1:6–17. Damen’s device provides the user with a Physical Activity Index (PAI) value or a derivative thereof. *Id.* at 1:28–30. The PAI “is calculated by multiplying an average of a processed signal or samples of a signal of an acceleration sensor with at least one constant.” *Id.* at 1:30–2:3. Figures 1A–1C are reproduced below:



Figures 1A–1C, reproduced above, show a front, rear, and side view of a portable device. Portable device 1 includes a housing 2 that houses at least one, and in one embodiment, three acceleration sensors. *Id.* at 5:19–34. The portable device includes clip 9 that can be attached to the belt of a user.

Id. at 4:26–28. The acceleration sensor(s) provide a signal when the user is walking or running with the portable device clipped to the belt. *Id.* at 5:19–34. The signals from the one or more acceleration sensors are processed by amplification circuitry and converted to a digital sequence of numbers by an A/D converter. *Id.* at 6:1–14. A microprocessor calculates the average of the absolute value of the acceleration data over a time period, such as the last day or the last week. *Id.* The PAI is computed by multiplying this average by a constant reflecting the average oxygen consumption of a large number of experimental subjects and a sensor calibration factor. *Id.* The calculated PAIs are stored in memory and can be displayed on the display. *Id.* at 6:31–34. The display may also show, either numerically or graphically, a derivative of the PAI. *Id.* at 5:8–14.

2. *Independent Claim 1 and 25*

Petitioner asserts that independent claims 1 and 25 would have been anticipated by Damen. Pet. 28–32, 33–34. Petitioner relies on its discussion of claim 1 for much of its analysis of the limitations of claim 25. *Id.* at 33–34. Claim 25 differs, in relevant part, from claim 1 because it recites “wherein the activity points correlate to an amount and intensity of the physical activity of the user.” Ex. 1001, 44:18–20. For efficiency purposes we discuss the limitations of these claims together.

Petitioner contends that the recited “[a] portable activity monitoring device to calculate activity points corresponding to physical activities of a user, the portable activity monitoring device comprising,” is disclosed by Damen’s portable device that monitors a user’s physical activity, employs acceleration sensor(s) to detect the motion of the user, and uses these data to

calculate a PAI based on the signals generated by the acceleration sensor(s).
Pet. 30.

Petitioner asserts that Damen discloses “a housing having a physical size and shape that is adapted to couple to the body [of] the user.” *Id.* Petitioner explains that Damen discloses a portable activity monitor with an injection molded housing and a clip that is located on the rear side of the monitor for attaching the monitor to an item of clothing. *Id.* at 31.

Petitioner asserts for the recited limitation “a plurality of sensors, disposed in the housing, to generate sensor data which is representative of activity of the user, wherein the plurality of sensors includes at least three accelerometers,” Damen describes and depicts three acceleration sensors that generate signals depending on the movements of the wearer of activity monitor 1 in Figure 3. *Id.*

Similar to our discussion in regards to Kroll, Patent Owner here again disputes Petitioner’s contentions regarding “a plurality of sensors, disposed in the housing, to generate sensor data which is representative of activity of the user, wherein the plurality of sensors includes at least three accelerometers.” PO Resp. 27–31. According to Patent Owner, “sensing instruments, such as accelerometers, are distinguishable from the claimed ‘sensors,’ wherein a single claimed ‘sensor[]’ may include one or more accelerometers.” *Id.* at 27 (citing Ex. 1001, 12:3–12; Ex. 2001 ¶ 53) (alteration in original). Further, Patent Owner asserts that Damen’s “plurality of single axis accelerometers form a single multi-axial accelerometer, [and a person of ordinary skill in the art] would [have] understood the plurality of single axis accelerometers collectively constitute

a single ‘sensor[],’ and do not disclose ‘a plurality of sensors,’ as claimed.”
Id. (citing Ex. 2001 ¶ 53) (alterations in original).

As to this limitation, Petitioner directs us to Figure 3 of Damen and its accompanying text. Pet. 31 (citing Ex. 1006, Fig. 3, 5:19–6:5; Ex. 1002 ¶ 209). Figure 3 of Damen is reproduced below.

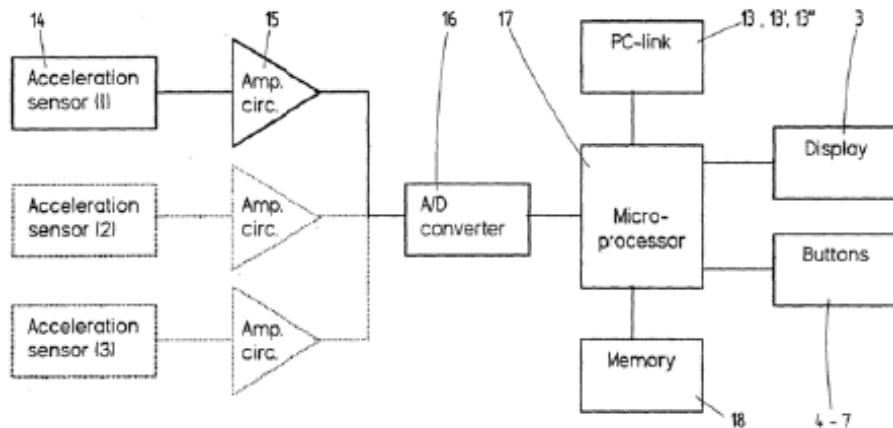


fig3

Figure 3 depicts the “electrical circuitry” of Damen’s device. Ex. 1006, 4:15–16. Dr. Young explains that “[t]he three accelerometers of Damen’s activity monitor generate signals upon detection of the motion of the user wearing the monitoring device containing the accelerometers.” Ex. 1002 ¶ 209. Figure 3 includes “a single one-dimensional accelerometer 14, e.g., a so-called uniaxial piezo-electric accelerometer, which registers body movement of a wearer of the monitor 1.” Ex. 1006, 5:21–24. Damen states that “[a]s a matter of course, it is also possible to employ e.g. three sensors 14 (as depicted by dotted lines).” *Id.* at 5:32–34.

Patent Owner argues that Figure 3 shows that acceleration sensors (1)–(3) are not separate sensors because they are integrated and fed into a single A/D converter and microprocessor. PO Resp. 28. Petitioner responds that “[i]t was known that a single A/D converter could handle inputs from

multiple *different* elements.” Reply 20 (citing Ex. 1044 ¶¶ 41–43).

Dr. Young supports this position by opining that “using a common A/D converter was a well-known method for conserving resources—specifically, avoiding the need for multiple A/D converters.” Ex. 1044 ¶ 43. Dr. Young further testifies that one of ordinary skill in the art would have been familiar with multiplexing different types of sensors such as an accelerometer and a temperature sensor to utilize the same A/D converter and that would not have caused one of ordinary skill to view these sensors as combined. *Id.*

¶ 44. On Sur-Reply, Patent Owner maintains that Damen’s three accelerometer structure is similar to a single 3-axis accelerometer described in Exhibit 2004. Sur-Reply 20–21. This, however, is insufficient to persuade us that Damen’s disclosures must be viewed in that light.

On the record before us, we find Petitioner’s arguments to be persuasive. As we noted above in the discussion related to Kroll, the ’377 patent states that its device may “include one or more motion sensors” and that “exemplary motion sensors [include] one or more accelerometers.” Ex. 1001, 2:52–53, 3:6–8. As such, even if Patent Owner’s view is correct and the ’377 claims require not just three accelerometers, but a plurality of motion sensors, altitude sensors, and/or physiological sensors (PO. Resp. 27) then Damen’s three accelerometers still meet that limitation. This is true because according to the ’377 patent a motion sensor may be composed of one accelerometer and the inventive device may include multiple motion sensors.

As to the recited “processing circuitry,” Petitioner directs us to Damen’s disclosure of microprocessor 17 as described in Figure 3 and its accompanying text. Pet. 31. Petitioner asserts that Damen discloses the

limitation “calculate the activity points of the user using the sensor data, wherein the activity points correlate to an amount of one or more physical activities of the user.” *Id.* at 32. Petitioner explains that Damen’s microprocessor 17 “calculates a Physical Activity Index (PAI) and derivatives of PAI using accelerometer data, which quantify the energy expenditure of a user due to the user’s physical activity, i.e. ‘activity points’ where that term is interpreted more broadly.” *Id.*

Patent Owner disputes Petitioner’s contentions that “*Damen’s* microprocessor 17 calculates a Physical Activity Index (PAI) and derivatives of PAI using accelerometer data, which quantify the *energy expenditure* of a user due to the user’s physical activity.” PO Resp. 31–32 (citing Pet. 32). Patent Owner explains that PAI correlates to the intensity of physical activities during a selected period of time, and not to the amount of physical activities. *Id.* at 32.

Patent Owner argues that

As the Petition points out, *Damen* explains that PAI is calculated by “dividing the Total Energy Expenditure (TEE) e.g. the amount of energy that is consumed by a person during a selected period of time, e.g. a day, by the Basal Metabolic Rate (BMR), i.e. the amount of energy that is consumed by a person lying still on a bed for the same period of time.” (Ex. 1006, 3:13–18; Pet., 32 (citing same).) In other words, the length of time used to measure PAI is by definition kept constant, and PAI measures the amount of energy consumed of all physical activity over that length of time. (Ex. 2001 ¶ 66.)

Id. Thus, in Patent Owner’s view, “PAI does not correlate to the amount of physical activities (but rather is closer to intensity).” *Id.* Patent Owner asserts that PAI measures the intensity of all physical activity performed over a predefined time period such as one day and that as such it would

include active and sedentary periods. *See id.* According to Patent Owner, a person of ordinary skill “would have understood that a person could expend the same amount of total energy by sprinting for a short period of time or jogging at a slower pace for a longer period of time, resulting in the same PAI (in *Damen*) during the selected time period.” *Id.* at 33.

Petitioner argues that Patent Owner “ignores that PAI would also change if intensity stayed the same, but the amount of physical activity varied (e.g., running 3 miles versus 5 miles (or for a longer duration) at the same speed).” Reply 22 (citing Ex. 1044 ¶¶ 45–47). Dr. Young supports Petitioner by opining that “because PAI correlates to total energy expenditure during, for instance, a day, it would vary as a function of both the amount and the intensity of the physical activity.” Ex. 1044 ¶ 46.

We find Petitioner’s argument to be persuasive. Petitioner points to *Damen*’s microprocessor 17 which calculates a PAI. Pet. 32. Petitioner explains that the Total Energy Expenditure (TEE), used to calculate the PAI, is the amount of energy that is consumed by a person during a selected period of time. *Id.* The TEE is divided by the Basal Metabolic Rate. *Id.* We find persuasive Petitioner’s evidence that PAI is a function of both the amount and intensity of physical activity. If time is a constant then the amount of exercise and the intensity of that exercise are the factors that will cause the PAI to fluctuate. Patent Owner acknowledges that “a person could expend the same amount of total energy by sprinting for a short period of time or jogging at a slower pace for a longer period of time, resulting in the same PAI (in *Damen*) during the selected time period.” PO Resp. 33. Thus, even in Patent Owner’s view the two things that impact the PAI are the intensity of the activity (sprinting vs jogging) and the amount (short period

of time versus a longer period of time). *See id.* Thus, we are persuaded that Damen’s PAI discloses activity points that correlate to the amount and intensity of physical activity.

Petitioner asserts that the recited limitation “a display, coupled to the processing circuitry, to output the data which is representative of the activity points to the user,” is disclosed by Damen. Pet. 32. Petitioner explains that Damen discloses activity monitor 1 with LCD display 3 coupled to processor 17. *Id.*

We are persuaded that Petitioner’s explanations and supporting evidence with respect to independent claims 1, 10, and 25 establish by a preponderance of the evidence that claims 1, 10, and 25 are unpatentable under § 102 as anticipated by Damen.

3. *Dependent Claims 2, 9, and 28*

Petitioner further asserts that claims 2, 9, and 28 are anticipated by Damen. Pet. 33–34. Beyond the arguments addressed above, Patent Owner does not challenge Petitioner’s substantive anticipation case in its Patent Owner Response. *See generally* PO. Resp. We have reviewed Petitioner’s contentions with respect to claims 2, 9, and 28 and we determine Petitioner has established by a preponderance of the evidence that Damen anticipates these claims.

E. *Obvious over Damen and Kroll*

Petitioner asserts that claims 10, 11, and 16 are unpatentable under § 103 as obvious over Damen and Kroll when construed broadly as to “activity points” and “processing circuitry.” Pet. 34–37. Petitioner cites to the Declaration of Dr. Young for support for its allegations. *Id.*

Petitioner relies on its discussion of claim 1 as anticipated by Damen for much of its analysis of the limitation of claim 10. *Id.* at 35–36. Claim 10 differs, in relevant part, from claim 1 because it recites “wherein the at least one sensor includes a tri-axial accelerometer.” Ex. 1001, 44:13–14. Petitioner supplements its prior contentions by arguing that one of ordinary skill in the art would have known that substituting Damen’s three accelerometers with a tri-axial accelerometer “would simply involve electrically coupling the outputs of each of the x, y, and z sensors of a tri-axial accelerometer to the amplification circuits 15 of Damen.” Pet. 35. Petitioner cites Kroll’s tri-axial accelerometer to support this argument. *Id.* at 36.

Claim 11 depends from claim 10, and further recites “wherein the processing circuitry further calculates, based on or using the activity points corresponding to the physical activity of the user, a state of an avatar, a badge and/or an activity grade.” Ex. 1001, 44:24–28. Petitioner asserts that Damen teaches this limitation because “Damen states that the numerical value of the PAI can be averaged over one or more selectable time periods, and a segmented bar may graphically display the PAI within a specific range.” Pet. 37 (citing Ex. 1006, 5:3–6; Fig. 1A). Claim 16 depends from claim 10, and further recites “wherein activity points correlate to (i) changes in altitude of the user or (ii) user speed, step frequency, energy expenditure and/or calorie burn.” Petitioner’s entire argument as to claim 16 is that Damon “combined with Kroll discloses this element. For example, the PAI calculated by Damen correlate to energy expenditure and/or calorie burn of the user.” *Id.* (citing Ex. 1006, 3:11–21; Ex. 1002 ¶ 238).

Patent Owner argues that Petitioner fails to provide sufficient motivation to combine Kroll and Damen. PO Resp. 50–52. As to claim 10, Petitioner argues that the proposed modification “would merely involve a substitution of a known element for another to yield predictable results.” Pet. 35. According to Petitioner, one of ordinary skill in the art “would have found it obvious to substitute the tri-axial accelerometer of Kroll in place of the three acceleration sensors of Damen to accomplish the forward/backward and up/down motion detection described in Damen.” *Id.* at 36. Patent Owner argues and we agree that “Petitioners have not demonstrated a reason to substitute *Damen*’s three accelerometers with a tri-axial accelerometer.” PO Resp. 51. Patent Owner contends that “according to Petitioners and their expert, *Damen*’s three accelerometers already accomplish the sole proffered reason for this proposed modification—motion detection in forward/backward and upward/downward direction[s].” *Id.* Thus, according to Patent Owner, it is unclear what would be gained by the combination.

In Reply, Petitioner argues that the art discloses the use of tri-axial accelerometers. Reply 24. Petitioner, however, does not provide a sufficient basis to show that one of ordinary skill in the art would have had reasons, with rational underpinning, to make this modification.

As such, Petitioner fails to establish why one of ordinary skill would have believed such a substitution to be desirable or in what way such a substitution would have been an improvement over Damen. Our inquiry into whether a sufficient motivation has been articulated by Petitioner is a flexible, but factual inquiry where we must determine whether sufficient evidence and argument have been presented to establish that one of ordinary skill in the art would have made such a modification. *See Fleming v. Cirrus*

Design Corp., 28 F.4th 1214, 1223 (Fed. Cir. 2022). The Federal Circuit “has recognized that an obviousness showing ‘does not require that a particular combination must be the preferred, or the most desirable, combination described in the prior art in order to provide motivation for the current invention.’” *Novartis Pharms. Corp. v. West-Ward Pharms. Int’l Ltd.*, 923 F.3d 1051, 1059 (Fed. Cir. 2019) (quoting *In re Fulton*, 391 F.3d 1195, 1200 (Fed. Cir. 2004)). Petitioner, however, still has a burden to establish a *reason why* a person of ordinary skill in the art would combine the prior art references. *In re NuVasive*, 842 F.3d 1376, 1382 (Fed. Cir. 2016). It is not sufficient to merely show that a person of ordinary skill “*could have made* but [rather, Petitioner must establish that a person of ordinary skill in the art] *would have been motivated to make* the combinations or modifications of prior art to arrive at the claimed invention.” *Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1073 (Fed. Cir. 2015). That is the missing element in Petitioner’s contentions. Petitioner has not articulated sufficiently a rationale for modifying Damen to replace its three accelerometers with a tri-axial accelerometer.

Claims 11 and 16 depend from claim 10 and the arguments and evidence presented for these claims do not address the shortcoming as to motivation to combine we note in reference to claim 10. Thus, Petitioner has not proven by a preponderance of the evidence that claims 10, 11, and 16 would have been obvious over Kroll and Damen.

F. Anticipation by Kateraas

1. *Kateraas*

Kateraas discloses a data collection device to monitor the physical activity level of a user. Ex. 1008 ¶ 2. The device may be used to determine

that a user's activity level, as determined by an exercise evaluation score, exceeds a certain threshold. *Id.* ¶ 35. “[T]his information can be used, for example, in conjunction with a physical activity rewards allocation system to provide rewards-based incentives to the user of data collection.” *Id.* ¶ 34. The device is a wearable device that may be incorporated into an article of clothing wearable on a user's wrist and includes infrared sensors, a temperature sensor, and an accelerometer. *Id.* ¶ 7. The accelerometer may be a single axis accelerometer or may include multiple accelerometers. *Id.* ¶ 18. Kateraas specifically describes the use in certain embodiments of a three-axis accelerometer, which includes three accelerometers arranged orthogonally with respect to one another. *Id.* “A three-axis accelerometer may be especially useful for the detection of movements associated with exercise and certain types of physical activity.” *Id.* ¶ 19. Kateraas's “microcontroller's accuracy in determining the physical activity level or exertion level of a user can be refined according to any desired algorithm.” *Id.* ¶ 36.

For example, as the user wears and uses data collection unit 10 over a period of time, microcontroller 40 may “learn” about the user by monitoring and storing quantities (e.g., heart rate, acceleration levels, and temperature) associated with periods during which the user is at rest and exercising. Using a predefined exercise threshold algorithm, the microcontroller can use this information to tailor the exercise threshold and store a new, updated exercise threshold based on the current fitness level of the user. *Id.* ¶ 37.

Microcontroller 40 determines when the user's physical activity level surpasses the exercise threshold. *Id.* ¶ 38. The microcontroller monitors the amount of time the user spends above the exercise threshold. *Id.* “Further,

via the sensed pulse rate, temperature, and acceleration levels measured, microcontroller 40 can determine and store a quantity that tracks the amount by which the user's physical activity exceeds the exercise threshold.” *Id.* The system uses this information, together or separate from exercise time, to determine a rewards quantity accrued by the user during each period of exercise. *Id.*

2. *Independent Claims 1, 10, and 25*

Petitioner asserts that independent claims 1, 10, and 25 would have been anticipated by Kateraas. Pet. 41–44, 46–47, 48–49. Petitioner relies on its discussion of claim 1 for much of its analysis of the limitations of claims 10 and 25. *Id.* Claim 1, 10, and 25 are substantially similar and for efficiency purposes we discuss the limitations of these claims together. For the reasons discussed below, Petitioner's allegations and evidence are insufficient to establish that claims 1, 10, and 25 would have been anticipated by Kateraas.

Claims 1 recites, in relevant part, “calculate the activity points of the user using the sensor data, wherein the activity points correlate to an amount of one or more physical activities of the user.” Ex. 1001, 44:39–41. Claims 10 and 25 recite, in relevant part, “calculate the activity points corresponding to the physical activity of the user using the sensor data, wherein the activity points correlate to an amount and intensity of the physical activity of the user.” Petitioner explains that Kateraas discloses that microcontroller 40 receives the sensor output and determines whether the user's level of physical activity qualifies as exercise. Pet. 42. Petitioner states this is accomplished by assimilating “one or more of the user's pulse rate, temperature, and acceleration levels into an exercise evaluation score.” *Id.*

Petitioner also states that to determine that the user is exercising, Kateraas's microcontroller compares "the exercise evaluation score" with a predetermined threshold level. *Id.* Petitioner explains that according to Kateraas, "[o]nce the user exceeds the exercise threshold, the microcontroller may start a timer that monitors the amount of time the user spends above the exercise threshold." *Id.* at 43 (citing Ex. 1008 ¶ 38) (alteration in original). Petitioner also explains that the quantities corresponding to the amount of activity reflects "activity points" when that term is construed broadly. *Id.* As to claim 10's requirement that the activity points "correlate to an amount and intensity of the physical activity," Petitioner asserts that "[a]n exercise evaluation score that exceeds the threshold corresponds to a physical activity that is sufficiently intense to exceed the threshold and qualify as exercise that earns rewards." *Id.* at 47.

Patent Owner argues that "*Kateraas*' exercise evaluation score does not correlate to an amount of one or more physical activities." PO Resp. 35 (Ex. 2001 ¶¶ 71–72). Dr. Sarrafzadeh supports Patent Owner's argument by testifying that "'the user's pulse rate, temperature, and acceleration levels' are all measurements of intensity of physical activity. Accordingly, *Kateraas*' exercise evaluation score indicates the user's current level of physical activity, where a score that exceeds a predetermined threshold indicates that a user is exercising." Ex. 2001 ¶ 72 (citing Ex. 1008 ¶ 35) (internal citations omitted).

We are persuaded by Patent Owner's assertions. Microcontroller 40 looks to the "user's level of activity" when it is generating the exercise evaluation score. Ex. 1008 ¶ 35. *Kateraas*'s "physical activity level or exertion level of a user" (*id.* ¶ 36) corresponds to intensity. We are not

persuaded that Kateraas's exercise evaluation score correlates to the amount of exercise.

Petitioner appears to acknowledge that the exercise evaluation score and predetermined threshold are measures of intensity. Petitioner states that “[w]hile the threshold for *starting* measurement may rely upon intensity, what is measured after that start corresponds to both the intensity and amount of exercise.” Reply 25. Petitioner then goes on to discuss Kateraas's rewards, which are based on exceeding the exercise threshold and the time spent above the threshold. *Id.* The Petition notes that a user may earn rewards, but nowhere in the Petition does Petitioner explain how such rewards are earned. *See* Pet. 38, 44, 47, 57. Similarly, Dr. Young's original declaration contains no discussion of how rewards may be earned. *See* Ex. 1002 ¶¶ 135, 147, 250, 251, 262, 305, 307, 320. At most, the Petition states that “[a]n exercise evaluation score that exceeds the threshold corresponds to a physical activity that is sufficiently intense to exceed the threshold and qualify as exercise that earns rewards.” Pet. 47. These contentions are insufficient to establish that Kateraas's rewards would disclose the recited activity point.

Finally, Petitioner states that “the microcontroller may start a timer that monitors the amount of time the user spends above the exercise threshold.” Pet. 43. Patent Owner persuasively argues that “time spent above the exercise threshold does not correlate to intensity of physical activities, as required by claim limitations 10[v] and 25[v].” PO Resp. 36. According to Patent Owner,

the claimed ‘activity points correlate to an amount and intensity of the physical activity of the user’ is not and cannot be met by, e.g., two distinct quantities or metrics, where one quantity

correlate to amount of physical activity (e.g., *Kateraas*’ timer), and another entirely different quantity correlate to intensity of physical activity (e.g., *Kateraas*’ amount by which activity exceeds threshold).

Id. at 37–38.

Thus, Petitioner presents us with three possible teachings to disclose the recited activity points and each is insufficient. The exercise evaluation lacks a disclosure of the amount of exercise. The rewards are insufficiently developed in the Petition with no disclosure as to the basis for receiving rewards. The timer may indicate the amount of time spent exercising, but Petitioner has not sufficiently established its correlation to intensity. To the extent that the timer could be said to indicate the amount of exercise and thus, serve as a sufficient teaching for claim 1’s activity points, the timer, however, is not displayed to the user and as such it provides an insufficient disclosure for another limitation of claim 1.

Claim 1 further recites, in relevant part, “a display, coupled to the processing circuitry, to output the data which is representative of the activity points to the user.” Ex. 1001, 43:43–45. Petitioner explains that *Kateraas* discloses a display that is coupled to the processing circuitry to output data representative of the activity points to the user. Pet. 43. Petitioner states *Kateraas*’s monitoring device includes a feedback element in the form of a display, light, audible speaker, or other suitable sensory interface that indicates when the user’s physical activity, as determined by the exercise evaluation score, exceeds the exercise threshold. *Id.* at 43–44. Petitioner explains an LED may blink during periods of qualifying exercise or a speaker may emit an audible beep every few seconds during periods of

qualifying exercise or a rewards indicator may be indicated by the display during qualifying exercise. *Id.* at 44.

While the claims are not specific as to the form of display, Kateraas does not indicate that the timer is displayed in any manner. *See* PO Resp. 46 (citing Ex. 2001 ¶¶ 83–84). Kateraas discloses several displays including blinking LEDs, audible beeps, and a rewards indicator that may be projected on a display during qualifying exercise sessions. Ex. 1008 ¶ 39. Patent Owner contends that “[a person of ordinary skill in the art] would have understood that such feedbacks do not inform the user of the amount of time he/she has spent above the exercise threshold.” PO Resp. 46 (citing Ex. 2001 ¶ 84). Petitioner responds that Kateraas determines rewards quantity based on time and intensity and thus, the rewards indicator would be a sufficient disclosure. Reply 27. For reason discussed above, we are not persuaded that Petitioner sufficiently describes Kateraas’s rewards in the Petition. Petitioner also asserts that Patent Owner has not explained why Kateraas’s blinking would not be a sufficient disclosure. *Id.* at 27–28. We, however, are not persuaded as to what the blinking is supposed to represent and thus, we do not have sufficient evidence as to whether the blinking is displaying activity points.

For all of the foregoing reasons, Petitioner has not established by a preponderance of the evidence that claims 1, 10, and 25 are unpatentable under § 102 as anticipated by Kateraas.

3. *Dependent Claims 2–4, 7–9, 11, 16, 28*

Petitioner further contends that dependent claims 2–4, 7–9, 11, 16, 28 are anticipated by Kateraas. Pet. 44–49. Petitioner’s contentions as to these dependent claims do not address the insufficiency we have found in

Petitioner's contentions as to the independent claims. As such, Petitioner has not established by a preponderance of the evidence that claims 2–4, 7–9, 11, 16, 28 are anticipated by Kateraas.

G. Obvious over Kateraas and Kahn

1. *Kahn*

Kahn discloses a method and apparatus for a step counter system. Ex. 1010, code (57). Khan's step counter includes an accelerometer to detect motion of the user, a step calculation logic to utilize the motion detected by the accelerometer to detect and count steps, and an incline logic to calculate an incline of a surface on which the user is moved. *Id.* at 1:36–40. Kahn's step counter calculates calorie expenditure based on the step and associated incline data together with personal data of the user, such as the user's height, weight, heart rate, and stride length. *Id.* at 3:55–59.

2. *Independent Claims 1, 10, and 25*

Petitioner asserts that claims 1, 10, and 25 are unpatentable under § 103 as obvious over Kateraas and Kahn. Pet. 49–65. Petitioner cites to the Declaration of Dr. Young for support. *Id.* Petitioner relies on its discussion of claim 1 as anticipated by Kateraas for much of its analysis of the limitations of claims 1, 10, and 25. *Id.* Claims 1, 10, and 25 are substantially similar and for efficiency purposes we discuss the limitations of these claims together.

Petitioner asserts that a person of ordinary skill would have found it obvious to combine Kateraas and Khan. *Id.* at 51–54. Petitioner explains that Kateraas does not explicitly disclose using incline data to calculate a physical activity and exertion level of an individual. *Id.* at 51. According to Petitioner, however, Kateraas recognizes that “[t]he microcontroller’s

accuracy in determining the physical activity level or exertion level of a user can be refined according to any desired algorithm.” *Id.* (citing Ex. 1008 ¶ 36). Petitioner states that one of ordinary skill in the art “would have reason to include incline data as input to the microcontroller of Kateraas to improve the accuracy of the microcontroller’s determination of physical activity level or exertion level.” *Id.*

In this Ground, Petitioner seeks to refine its assertions regarding Kateraas’s teachings by further including Kahn’s teaching “that ‘[t]he microcontroller’s accuracy in determining the physical activity level or exertion level of a user can be refined according to any desired algorithm.’” Pet. 51 (citing Ex. 1008 ¶ 36). According to Petitioner, “Kahn teaches that it was recognized that step counters underestimated calorie burn values because their calculations assumed the user’s steps were on a flat surface.” *Id.* Petitioner asserts that “[a] POSITA would recognize the benefit of modifying Kateraas’[s] system to utilize a slope detection system, as taught by Kahn, and would have a reasonable expectation of success.” *Id.* at 52. Petitioner also argues that including an altimeter in Kateraas’s device would provide an accurate way to monitor physical activity level. *Id.* Petitioner asserts that Kateraas’s data collection unit/device may include a variety of sensors, including “any other type of sensor suitable for monitoring physical activity levels.” *Id.* Petitioner also argues that “[t]hese sensors provide data that are processed to determine whether the user’s level of physical activity qualifies as exercise by assimilating conditions, such as the user’s pulse rate, temperature, and acceleration levels, into an exercise evaluation score.” *Id.*

Kahn, however is not asserted to remedy the deficiencies discussed above in relation to Kateraas. The disclosures relied upon in Kahn are

directed to improving the Kateraas's determinations as to intensity or level of exertion. *See* Pet. 51 (citing Ex. 1008 ¶ 36). As discussed above, Kateraas's disclosures were insufficient as to the correlation between the alleged activities and the amount of exercise with the possible exception of Kateraas's timer, which is not displayed to the user. The disclosures of Kahn do not resolve the insufficient disclosures of Kateraas.

For the foregoing reasons, we determine that Petitioner has not established by a preponderance of the evidence that claims 1, 10, and 25 would have been obvious over Kateraas and Kahn.

3. *Dependent Claims 2–9, 11–16, 26, 28, and 29*

Petitioner further asserts that dependent claims 2–9, 11–16, 26, 28, and 29 would have been obvious over Kateraas and Kahn. Pet. 57–65. Petitioner's contentions as to these claims do not address the insufficiency discussed above as to the independent claims. As such, Petitioner has not established by a preponderance of the evidence that claims 2–9, 11–16, 26, 28, and 29 would have been obvious over Kateraas and Kahn.

III. CONCLUSION¹⁰

Based on the evidence presented with the Petition, the evidence introduced during the trial, and the parties' respective arguments, Petitioner

¹⁰ 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. 16654 (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).

has shown by a preponderance of the evidence that each of claims 1, 2, 9–11, 16, 25, and 28 of the '377 patent are unpatentable. Petitioner has not shown by a preponderance of the evidence that claims 3–8, 12–15, 26, and 29 are unpatentable.

In summary:

Claim(s)	35 U.S.C. §	Reference(s) / Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1, 2, 9–11, 16, 25, 28	§ 102	Kroll	1, 2, 9–11, 16, 25, 28	
1, 2, 9, 25, 28	§ 102	Damen	1, 2, 9, 25, 28	
10, 11, 16	§ 103	Damen, Kroll		10, 11, 16
1–4, 7–11, 16, 25, 28	§ 102	Kateraas		1–4, 7–11, 16, 25, 28
1–16, 25, 26, 28, 29	§ 103	Kateraas, Kahn		1–16, 25, 26, 28, 29
Overall Outcome			1, 2, 9–11, 16, 25, 28	3–8, 12–15, 26, 29

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that Petitioner has established by a preponderance of the evidence that claims 1, 2, 9–11, 16, 25, and 28 of the '377 patent are unpatentable.

FURTHER ORDERED that Petitioner has not shown by a preponderance of the evidence that claims 3–8, 12–15, 26, and 29 are 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.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

KONINKLIJKE PHILIPS N.V. and PHILIPS NORTH AMERICA LLC,
Petitioner,
v.
FITBIT, INC¹¹.
Patent Owner.

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McKONE, *Administrative Patent Judge*, Concurring.

As to the combination of Damen and Kroll, as it pertains to claims 10, 11, and 16, the Majority finds that Petitioner has not shown why it would have been desirable, or an improvement, to substitute a tri-axial accelerometer, as taught in Kroll, for Damen's three accelerometers. I disagree that it was incumbent on Petitioner to show desirability or improvement. Rather, *KSR* makes clear that "when a patent claims a structure already known in the prior art that is altered by the mere substitution of one element for another known in the field, the combination must do more than yield a predictable result." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007) (citing *United States v. Adams*, 383 U.S. 39, 50–

¹¹ Patent Owner Fitbit, Inc. is now Fitbit LLC. See Paper 13.

51 (1966)); *cf. In re Mouttet*, 686 F.3d 1322, 1334 (Fed. Cir. 2012) (“This court has further explained that just because better alternatives exist in the prior art does not mean that an inferior combination is inapt for obviousness purposes.”).

Petitioner argues that:

Substituting a tri-axial accelerometer for the three accelerometers disclosed by Damen would simply involve electrically coupling the outputs of each of the x, y, and z sensors of a tri-axial accelerometer to the amplification circuits 15 of Damen. This would merely involve a substitution of a known element for another to yield predictable results.

Pet. 35. Petitioner supports this argument with Dr. Young’s testimony. Ex. 1002 ¶¶ 231–232. I would find his testimony credible on this point. Patent Owner does not contest that a tri-axial accelerometer was a known substitution for three separate accelerometers (each sensing a different axis). PO Resp. 51. Rather, Patent Owner argues that Petitioner does not show why a single tri-axial accelerometer would have been the better choice. *Id.* Respectfully, I do not believe that showing such desirability or improvement is necessary. Rather, I would find that it is enough for Petitioner to show that a tri-axial accelerometer would have been a “mere substitution of one element for another known in the field,” namely, for three separate accelerometers. *KSR*, 550 U.S. at 416. I believe that Petitioner has made that showing, and, as such, I would find the that the combination of Damen and Kroll render claims 10, 11, and 16 obvious.

However, because the Majority finds that claims 10, 11, and 16 are anticipated by Kroll (a finding that I agree with and join), I agree with the result of the decision that claims 10, 11, and 16 are unpatentable.

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