

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

PELOTON INTERACTIVE, INC.,
Petitioner,

v.

JOHNSON HEALTH TECH CO., LTD.,
Patent Owner.

IPR2023-01163
Patent 10,032,227 B2

Before JAMES P. CALVE, BART A. GERSTENBLITH, and
JULIET MITCHELL DIRBA, *Administrative Patent Judges*.

DIRBA, *Administrative Patent Judge*.

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

On November 21, 2023, we instituted an *inter partes* review of claims 1–20 of U.S. Patent No. 10,032,227 B2 (Ex. 1001, “the ’227 patent”). Paper 7 (“Inst. Dec.”). Having considered the full record at trial, and for the reasons explained below, we determine that Petitioner has shown by a preponderance of the evidence that claims 1–20 are unpatentable.

I. BACKGROUND

A. *History of this Proceeding*

On August 2, 2022, Peloton Interactive, Inc. (“Petitioner”) filed a Petition requesting an *inter partes* review of claims 1–20 of the ’227 patent (Paper 2, “Pet.”), and Petitioner submitted a declaration from Mr. R. Lee Rawls in support (*see* Ex. 1002). Johnson Health Tech Co., Ltd. (“Patent Owner”)¹ waived the filing of its preliminary response. Paper 5. Based on the preliminary record, we determined that Petitioner demonstrated a reasonable likelihood that it would prevail in establishing the unpatentability of at least one challenged claim, and we instituted an *inter partes* review of all challenged claims on all asserted grounds. Inst. Dec. 22–23.

During trial, Patent Owner filed a Response (Paper 27, “PO Resp.”), Petitioner filed a Reply (Paper 29, “Pet. Reply”), and Patent Owner filed a Sur-reply (Paper 31, “PO Sur-reply”). With its Response, Patent Owner submitted a declaration of Mr. Daniel van der Weide (*see* Ex. 2004) and the deposition transcript of Mr. Rawls (*see* Ex. 2005). There are no pending motions.

An oral hearing was held on September 5, 2024, and a transcript of the hearing is included in the record. Paper 37 (“Tr.”).

¹ Patent Owner also identifies Johnson Health Tech North America, Inc. as a real party-in-interest. Paper 3 (Patent Owner’s Mandatory Notices), 2.

B. Related Matters

The parties state that the '227 patent has been asserted in one district court lawsuit: *Johnson Health Tech Co. v. Peloton Interactive, Inc.*, No. 3:22-cv-606 (W.D. Wis.). Pet. 91; Paper 3, 2.

In addition, Petitioner has challenged patents related to the '227 patent in IPR2023-01164 and IPR2023-01165. Pet. 91–92. Concurrently with this Decision, the Board also enters final written decisions in those proceedings.

C. The Grounds

We instituted trial on the following grounds of unpatentability:

Claim(s) Challenged	35 U.S.C.² §	Reference(s)/Basis
1–9, 12, 14–20	103	Morris ³ , Ray ⁴
10, 11, 13, 20	103	Morris, Ray, Cox ⁵
1–6, 14, 20	103	Ray, AAPA ⁶
10, 11, 20	103	Ray, AAPA, Cox

² The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125 Stat. 284, 285–88 (2011), revised 35 U.S.C. § 103 effective March 16, 2013. Because the '227 patent claims priority to applications filed after that date, we refer to the current version of Section 103.

³ US 2010/0160115 A1, published June 24, 2010 (Ex. 1006).

⁴ US 9,785,827 B1, filed Sept. 17, 2014, issued Oct. 10, 2017 (Ex. 1004).

⁵ US 7,736,273 B2, issued June 15, 2010 (Ex. 1005).

⁶ Petitioner contends that column 1, line 35 to column 2, line 19 of the Specification of the '227 patent is applicant admitted prior art (“AAPA”). *See, e.g.*, Pet. 66. For the reasons explained below, we do not reach the merits of this contention.

Claim(s) Challenged	35 U.S.C. ² §	Reference(s)/Basis
7–9, 12	103	Ray, AAPA, Daly ⁷
13	103	Ray, AAPA, Daly, Cox

D. The '227 Patent

The '227 patent is titled “Exercise Apparatus with Exercise Use Verification Function and Verifying Method,” and the application that led to this patent was filed on December 29, 2015, claiming priority to a provisional application filed on December 30, 2014. Ex. 1001, codes (22), (54), (60).

The '227 patent describes a motor-driven exercise apparatus that can verify a user’s exercise. Ex. 1001, 1:14–17, 1:51–2:36. The Specification explains that some insurance companies offer lower rates to customers who supply proof of regular exercise. *Id.* at 1:18–29. Although some existing exercise equipment can report exercise use data (*id.* at 1:29–50), users can sometimes falsify that data (*id.* at 1:58–63). For example, a user may set a treadmill to run, even though the user is not actually walking or running on the treadmill, which would cause the treadmill to report “faked” data. *Id.* at 1:67–2:7.

Figure 2 (reproduced below) is a schematic drawing of an embodiment of the '227 patent’s invention. Ex. 1001, 3:22–23.

⁷ US 8,574,131 B2, issued Nov. 5, 2013 (Ex. 1011).

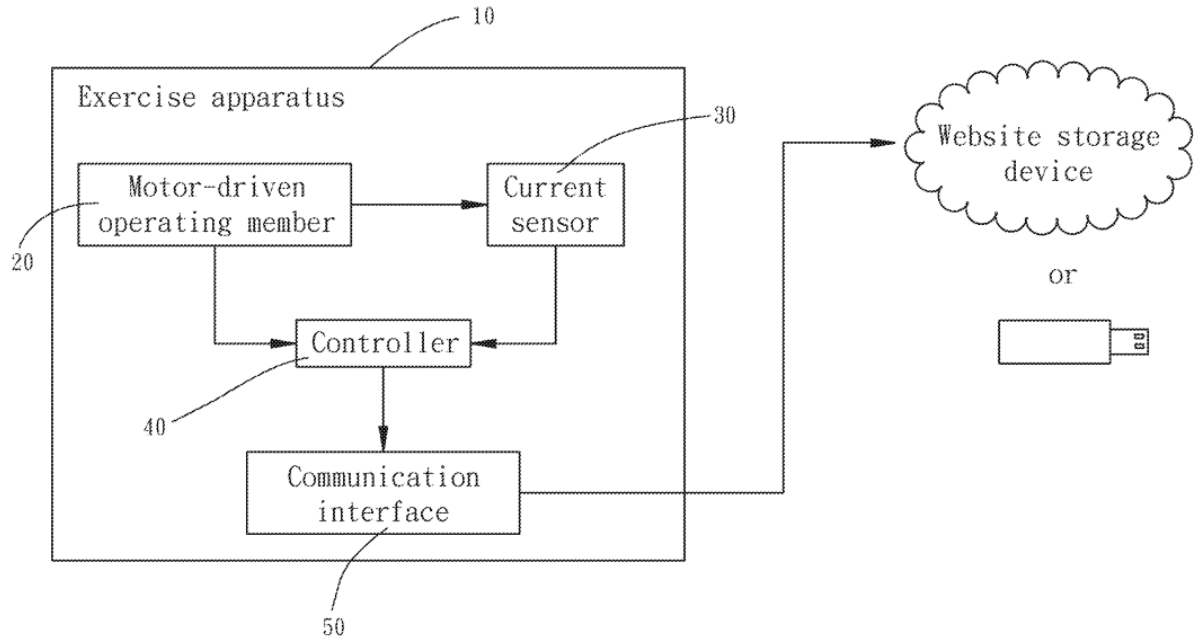


FIG. 2

Figure 2 illustrates exercise apparatus 10, which includes motor-driven operating member 20, current sensor 30, controller 40, and communication interface 50, as well as an arrow depicting a communication link connecting exercise apparatus 10 via communication interface 50 to a website storage device or a flash drive. Ex. 1001, 4:36–49, 6:19–32.

Motor-driven operating member 20 is coupled to current sensor 30, which detects the current input to a drive motor and generates signals proportional to that current. Ex. 1001, 3:65–4:14. Controller 40 communicates with current sensor 30 to detect current changes caused when a user engages with motor-driven operating member 20. *Id.* at 4:50–67. Exercise apparatus 10 can detect a user's presence via optical sensor 60 that senses infrared radiation, pressure sensor 70 that senses pressure on the running belt, a speed sensor that senses fluctuations in speed of the operating unit, a thermal sensor that senses body heat, or any other suitable sensor. *Id.* at 5:34–50, Figs. 4, 5. If the user is not detected, the controller creates non-

validated exercise use data, and if the user is detected, the controller creates validated exercise use data. *Id.* at 5:51–57. Communication interface 50 transmits exercise use data to users via a display screen, to third parties (such as physicians or insurance companies) via Internet interface or port, and to flash drives and website storage devices via wired or wireless connections. *Id.* at 6:5–43.

E. Challenged Claims

Petitioner challenges all twenty claims of the '227 patent. Of these, claims 1, 12, and 14 are independent. We reproduce these claims below with Petitioner's reference designations added:

1. [pre] An exercise apparatus comprising:
 - [a] a base;
 - [b] an operating unit movable relative to the base;
 - [c] a motor coupled to the operating unit;
 - [d] a sensor operable to detect engagement of a user with the operating unit;
 - [e] a controller in communication with the operating unit and the sensor; and
 - [f] a communication interface in communication with the controller, [g] wherein the controller is configured to generate a non-validated exercise use data in response to movement of the operating unit relative to the base and the sensor does not detect engagement of the user with the operating unit, [h] wherein the controller is further configured to generate a validated exercise use data in response to movement of the operating unit relative to the base and the sensor does detect engagement of the user with the operating unit, and [i] wherein the controller transmits the validated exercise use data to the communication interface.

Ex. 1001, 7:56–8:8; *see* Pet. 94.

12. [pre] A motorized treadmill comprising:

[a] a base;

[b] an endless belt movable relative to the base;

[c] a motor operably coupled to the endless belt;

[d] a sensor configured to detect engagement of the endless belt by a user; and

[e] a controller configured to record validated exercise use data in response to the sensor detecting of engagement of the endless belt by the user, [f] the validated exercise data including an amount of user exercise time, the amount of user exercise time being generated by an amount of time that the sensor detects engagement of the endless belt by the user,

[g] wherein the sensor includes a pressure sensor configured to detect an amount of pressure on a portion of the endless belt and generate a pressure data, and the controller is configured to analyze the pressure data to detect engagement of the endless belt by the user.

Ex. 1001, 8:50–67; *see* Pet. 96–97.

14. [pre] An exercise apparatus comprising:

[a] a base;

[b] an operating unit movable relative to the base;

[c] a motor coupled to the operating unit;

[d] a sensor operable to detect engagement of a user with the operating unit;

[e] a controller in communication with the operating unit and the sensor; and

[f] a communication interface in communication with the controller, [g] wherein the controller is configured to generate a validated exercise use data in response to the operating unit moving relative to the base and the sensor detecting engagement of the user with the operating unit, and wherein the

controller transmits the validated exercise use data to the communication interface.

Ex. 1001, 9:8–23; *see* Pet. 97–98.

II. ANALYSIS

A. *Legal Standards*

A patent claim is unpatentable under 35 U.S.C. § 103 “if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains.” The legal question of obviousness is resolved on the basis of underlying factual determinations including (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) when in evidence, objective evidence of obviousness or nonobviousness.⁸ *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17–18 (1966). One seeking to establish obviousness based on more than one reference also must articulate sufficient reasoning with rational underpinnings to combine teachings. *See KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007).

In an *inter partes* review, the petitioner has the burden of proving unpatentability by a preponderance of the evidence. 35 U.S.C. § 316(e); *see also Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (stating that petitioner’s burden of persuasion “never shifts to the patentee”).

⁸ The current record does not include allegations or evidence of objective indicia of obviousness or nonobviousness.

B. Level of Ordinary Skill in the Art

Petitioner asserts that the level of ordinary skill in the art corresponds to “(i) a bachelor’s degree in an exercise related field or mechanical or electrical engineering and (ii) three to five years of industry experience in designing cardiovascular exercise equipment (such as treadmills, bicycles, steppers, ellipticals) or in a similar field.” Pet. 15 (citing Ex. 1002 ¶¶ 31–34). Petitioner also asserts that a person could qualify as an ordinarily skilled artisan with less education but more experience, or less experience but more education. *Id.*

Patent Owner proposes the same level of ordinary skill in the art, except that Patent Owner states that the industry experience would have been “in analyzing and/or designing exercise equipment (such as treadmills, bicycles, steppers, ellipticals) or in a similar field.” PO Resp. 15–16.

Having considered the record, we adopt Petitioner’s proposed level of skill, as articulated above. We are satisfied that Petitioner’s proposal comports with the level of skill necessary to understand and implement the teachings of the ’227 patent. *Accord* Inst. Dec. 8. Patent Owner’s proposal adds “analyzing” and removes “cardiovascular,” but these differences are immaterial to this proceeding. *See* Pet. Reply 28 n.10. Moreover, all of our analysis in this Decision would remain the same under Patent Owner’s articulation of the level of ordinary skill in the art.

C. Claim Construction

We interpret claim terms 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). Under the principles set forth by our reviewing court, the “words of a claim ‘are generally given their ordinary

and customary meaning,” as would be understood by a person of ordinary skill in the art at the time of the invention. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc) (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)).

Petitioner does not identify any terms or phrases for construction (Pet. 15), but Patent Owner proposes constructions for “exercise use data,” “validated exercise use data,” and “non-validated exercise use data” (PO Resp. 4–13).

Below, we address the construction of the three terms identified by Patent Owner. We determine that it is not necessary to construe any other claim terms or phrases for purposes of this Decision. *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., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

I. Exercise Use Data

The term “exercise use data” appears in each independent claim. Patent Owner contends it means “data that would represent an amount of exercise of the user.” PO Resp. 4–6. According to Patent Owner, the Specification defines this claim term. *Id.* at 4–5 (citing Ex. 1001, 51:37–40:59–6:4).

In its briefing, Petitioner disagreed with Patent Owner’s proposed construction, arguing that it is “overly narrow . . . and arbitrarily excludes other forms of ‘exercise use data.’” Pet. Reply 2–4. However, during the oral hearing, Petitioner adopted Patent Owner’s proposal. Tr. 14:12–15:17.

For purposes of this proceeding, we apply Patent Owner’s narrower construction and assume that “exercise use data” is “data that would represent an amount of exercise of the user.” We do not need to further construe this term because Petitioner shows that the challenged claims are unpatentable even under Patent Owner’s narrower construction of it.

2. *Validated and Non-Validated Exercise Use Data*

Claim 1 recites “validated exercise use data” and “non-validated exercise use data” in the following limitations:

the controller is configured to generate a *non-validated exercise use data* in response to movement of the operating unit relative to the base and the sensor does not detect engagement of the user with the operating unit, . . . [and] the controller is further configured to generate a *validated exercise use data* in response to movement of the operating unit relative to the base and the sensor does detect engagement of the user with the operating unit.

Ex. 1001, 7:65–8:6 (emphasis added). Claims 12 and 14 include a similar recitation of “validated exercise use data,” although neither recites “non-validated exercise use data.” *Id.* at 8:56–58, 9:17–21; *see also* PO Resp. 6 n.1 (stating that claim 1 is representative of the other claims for purposes of construing “validated exercise use data”).

Patent Owner proposes lengthy constructions for both “validated exercise use data” and “non-validated exercise use data.” PO Resp. 6–13; PO Sur-reply 8–11. Specifically, according to Patent Owner, *validated* exercise use data is “exercise use data that has been determined to have occurred by the controller in response to the sensor detecting a user engaging the moving operating unit (or endless belt)” (PO Resp. 6), and *non-validated* exercise use data is “exercise use data that has been

determined to have occurred by the controller in response to the sensor not detecting a user engaging the moving operating unit (or endless belt)” (*id.* at 11–12). In support, Patent Owner argues that the Specification uses the terms in this way. *Id.* at 6–8 (citing Ex. 1001, 2:47–51, 7:5–7, 7:12–14, 7:23–47, claim 1, Fig. 6). Patent Owner also asserts that Petitioner improperly assumes that the claims cover any data generated “while” a sensor detects user engagement, even if that data is not generated “in response to” the sensor detection. *Id.* at 8–13. In addition, Patent Owner argues that “exercise use data” includes data that is neither “validated” nor “non-validated” by the controller. *Id.* at 12–13.

Petitioner responds that Patent Owner’s proposed constructions improperly import limitations from the surrounding claim language. Pet. Reply 6–7 & n.3, 9 n.5. Petitioner also argues that “exercise use data” must be either “validated” or “non-validated,” as confirmed by the Specification. *Id.* at 9–10 (citing Ex. 1001, 2:15–19, 4:45–49, 6:5–9).

Having considered the parties’ arguments and the evidence of record, we disagree with Patent Owner’s proposed constructions for “validated exercise use data” and “non-validated exercise use data.” We have construed “exercise use data” to be “data that would represent an amount of exercise of the user” (as proposed by Patent Owner) (*see supra* § II.C.1), and the modifiers “validated” and “non-validated” are readily understood. In particular, “non-validated” exercise use data is “exercise use data” that is not “validated” (or not yet “validated”). Our understanding of these terms is further confirmed by the Specification’s description of them. For example, the Specification states that “non-validated exercise use data” can be generated and then, if the user is detected, recorded as “validated exercise use data.” *See, e.g.*, Ex. 1001, 2:53–63, 5:1–57, 7:41–44. This indicates that

“exercise use data” is either “validated” or “non-validated.” *See also id.* at 4:45–49 (communication interface 50 communicates “exercise use data (validated and/or unvalidated)”). The Specification once refers to “exercise use data (*e.g.*, validated and/or unvalidated exercise use data” (*id.* at 6:5–9 (emphasis added)), which indicates that “exercise use data” might also include something else; however, this single use of *exempli gratia* does not override the plain meaning of these terms and the Specification’s other disclosures.

Patent Owner fails to sufficiently support its proposed constructions. Patent Owner asserts that the Specification describes an embodiment that meets its requirements (*see* PO Resp. 6–8, 12–13), but this argument is unavailing. *See Thorner v. Sony Comput. Ent. Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012) (“It is not enough for a patentee to simply disclose a single embodiment or use a word in the same manner in all embodiments, the patentee must clearly express an intent to redefine the term.” (internal quotation marks omitted)). Patent Owner also relies on the claim phrases in which these terms appear (*see* PO Resp. 6, 10), but this cuts against Patent Owner’s position. Patent Owner’s proposals are disfavored because they would render part of the phrases superfluous. *See Bicon, Inc. v. Straumann Co.*, 441 F.3d 945, 950 (Fed. Cir. 2006) (“[C]laims are interpreted with an eye toward giving effect to all terms in the claim.”); Pet. Reply 7 & n.3, 9 n.5 (arguing the same). Finally, Patent Owner cites to Mr. van der Weide’s declaration (*see* PO Resp. 6–13 (citing Ex. 2004 ¶¶ 36–50)); however, we give little weight to Mr. van der Weide’s testimony regarding claim construction because he fails to provide sufficient support for his conclusions. *See* Ex. 2004 ¶¶ 36–50; *Phillips*, 415 F.3d at 1318 (Although expert testimony “can be useful . . . to provide background on the

technology at issue, [or] to explain how an invention works, . . . conclusory, unsupported assertions by experts as to the definition of a claim term are not useful.”).

To the extent Patent Owner proposes a construction for the phrases rather than the terms (*see* Tr. 48:20–49:3), we reject those proposals as well. Patent Owner fails to sufficiently explain why we should rewrite the language used in the claim itself, and Patent Owner’s proposed constructions add confusion rather than clarity.⁹ In addition, Patent Owner leverages its revised language when attempting to import additional limitations into the claim. For example, Patent Owner appears to argue that the controller in the prior art fails to “validate” or “non-validate” the data (Tr. 47:17–48:6; *see, e.g.*, PO Resp. 23–26; PO Sur-reply 17); however, the claims do not include these requirements (*see, e.g.*, Ex. 1001, 7:65–66 (“the controller . . . generate[s]”)).

However, we do agree with one aspect of Patent Owner’s arguments. Patent Owner argues that “in response to”—which appears immediately following each instance of “validated exercise use data” or “non-validated exercise use data” in the independent claims—requires more than just concurrence or coincidence. *See* PO Resp. 8–13; Tr. 48:24–49:3 (explaining that the meaning of “in response to” is “the point of emphasis” in Patent Owner’s proposed constructions). We agree that “in response to” requires some degree of causality, not just concurrence. *See also* Tr. 70:15–71:5 (Petitioner agreeing with this point and asserting the proposed combination

⁹ Patent Owner’s proposed constructions are unclear, so we do not include an alternative analysis that expressly applies them to the proposed combination. But it appears that our substantive analysis would remain unchanged even under the constructions proposed by Patent Owner.

meets this requirement). For example, a flowchart can show that an action occurs “in response to” an event by showing an arrow from an event to the action. *See* Ex. 1001, 7:12–47, Fig. 6 (step 116 occurs “in response to” determining that the user was not detected at step 112, and step 128 occurs “in response to” determining that the user was detected at step 112).

D. Summary of Prior Art References

1. Morris (Ex. 1006)

Morris discloses an exercise machine with user detection features, such as treadmill 100 shown in Figure 1, reproduced below.

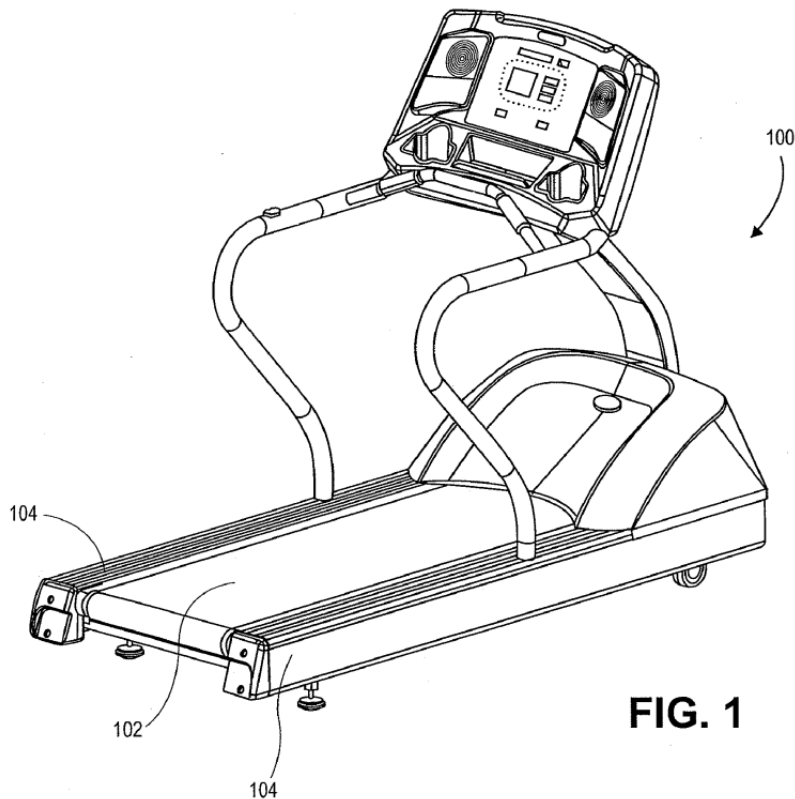


Figure 1 shows treadmill 100 comprising base 104 and treadmill belt 102 that glides over a floating deck surface of base 104 and that is driven by a belt driving mechanism (not shown). Ex. 1006 ¶¶ 25, 26.

The user detection mechanism is incorporated into treadmill base 200 as illustrated in Figure 2, which is reproduced below.

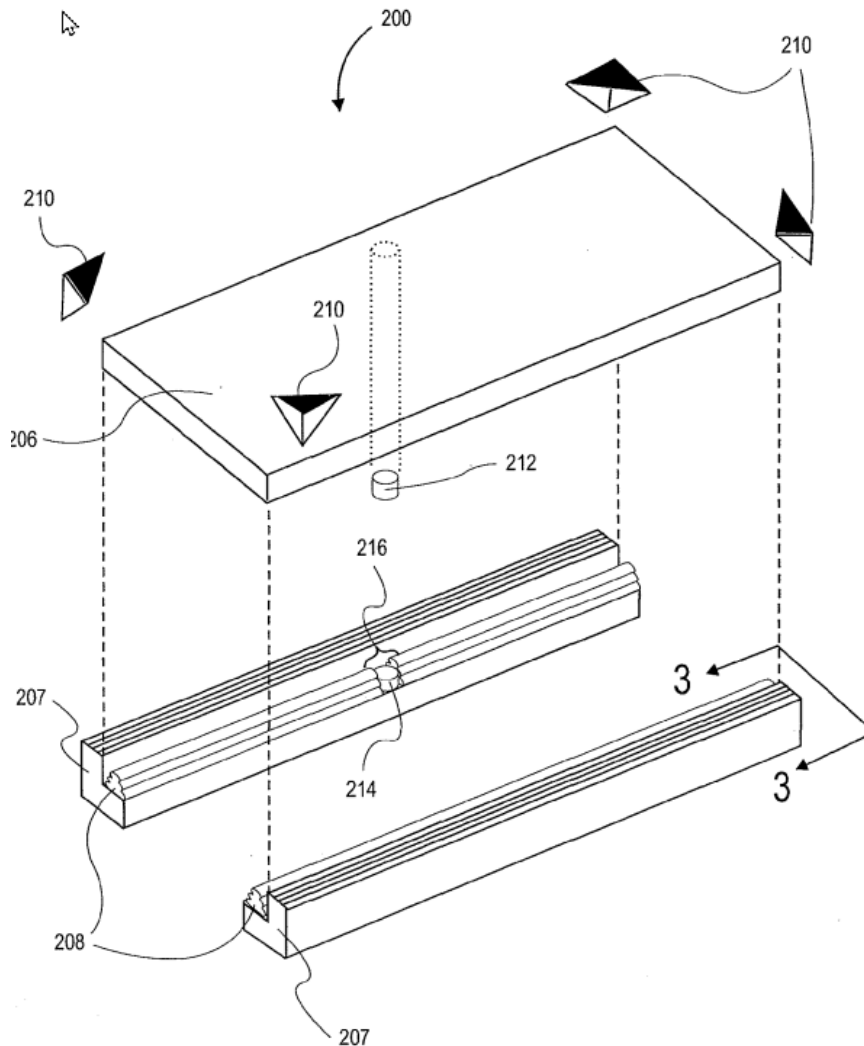


FIG. 2

Figure 2 illustrates a user detection mechanism comprising magnets 212 attached to or embedded in deck 206 to interact with induction coil 214 fixed along frame element 207 within compressible cushioning supports 208 that support deck 206. Ex. 1006 ¶ 27. As deck 206 moves due to a user's footfalls or weight shifts, corresponding movement of magnets 212 induces a current in induction coil 214, and the signal is transmitted by wire 311 to a processor for translation as shown in Figures 3A and 3B reproduced below.

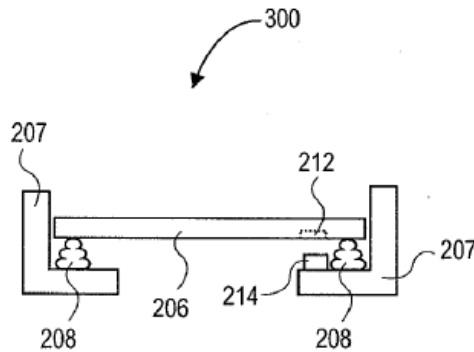


FIG. 3A

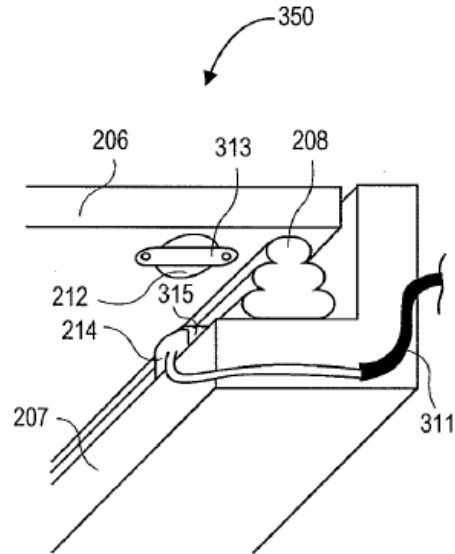


FIG. 3B

Figures 3A and 3B illustrate a user detection system with magnets 212 affixed to deck 206 to move therewith relative to induction coil 214 due to a user's footfalls or weight shifts. Movement of magnets 212 relative to coils 214 induces signals that are sent by wire 311 to a processor. *Id.* ¶¶ 27, 31. The processor distinguishes these large signals from “baseline” signals caused by slight vibrations in the treadmill due to the electric motor driving the belt. *Id.* ¶ 31. Magnetic and optical sensors may be used. *Id.* ¶ 33.

Inductance coil 214 communicates with translator board 518, which is part of processing system 500 shown in Figure 6 (reproduced below).

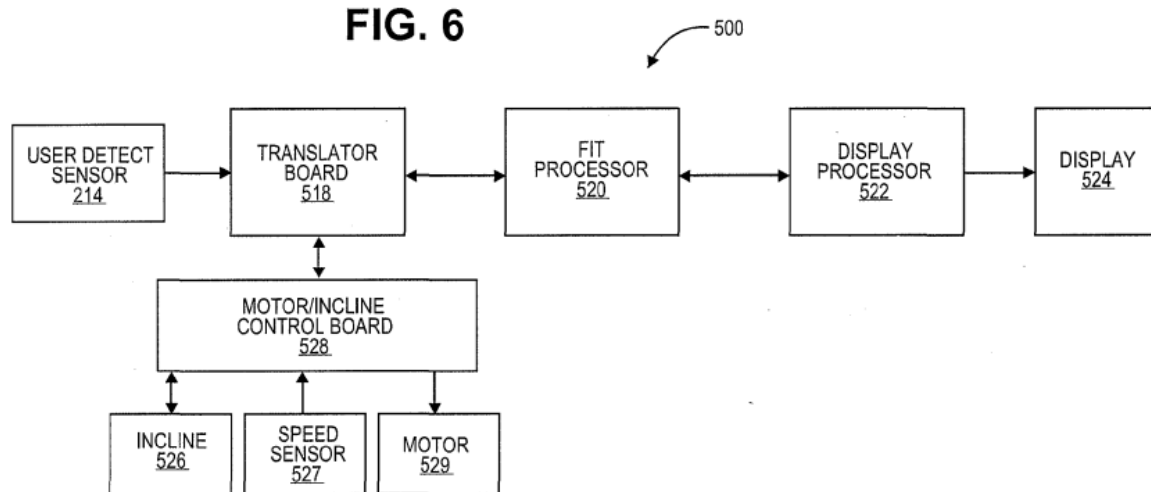


Figure 6 is a block diagram of treadmill information processing system 500 that comprises user detection sensors 214, translator board 518, FIT processor 520, display processor 522, display 524, motor/incline control board 528, incline controller 526, speed sensor 527, and motor driver 529. Ex. 1006 ¶¶ 32, 33. Translator board 518 interprets signals received from inductance coil 214 and forwards them to FIT processor 520, which uses this indication of a user's presence or absence to control a workout program. *Id.* ¶ 36. FIT processor 520 may communicate the user's presence to display processor 522, which may command display 524 to display indications of the user's presence or absence. *Id.* FIT processor 520 manages the workout program, e.g., duration, distance, incline, and intensity. *Id.* ¶ 35. Signal processors include translator board 518, FIT processor 520, and display processor 522. *Id.* ¶ 34. User cadence, footfall force, pace, heart rate, incline, distance, and program profile may be output as exercise information and shown on a display panel. *Id.* ¶¶ 50–53, Fig. 11.

2. Ray (Ex. 1004)

Ray is directed to a process to aid in motivation of personal fitness, including health monitoring and validation of a user. Ex. 1004, code (54).

To verify a user's identity and exercise data, Ray detects the user's movement on treadmill exercise machine 40 with camera 32 when exercise machine 40 is moving and exercise data 24 is being produced by exercise machine 40. Ex. 1004, 6:43–7:10, 13:20–30, 14:31–46. Figure 1 of Ray is reproduced below to illustrate this arrangement.

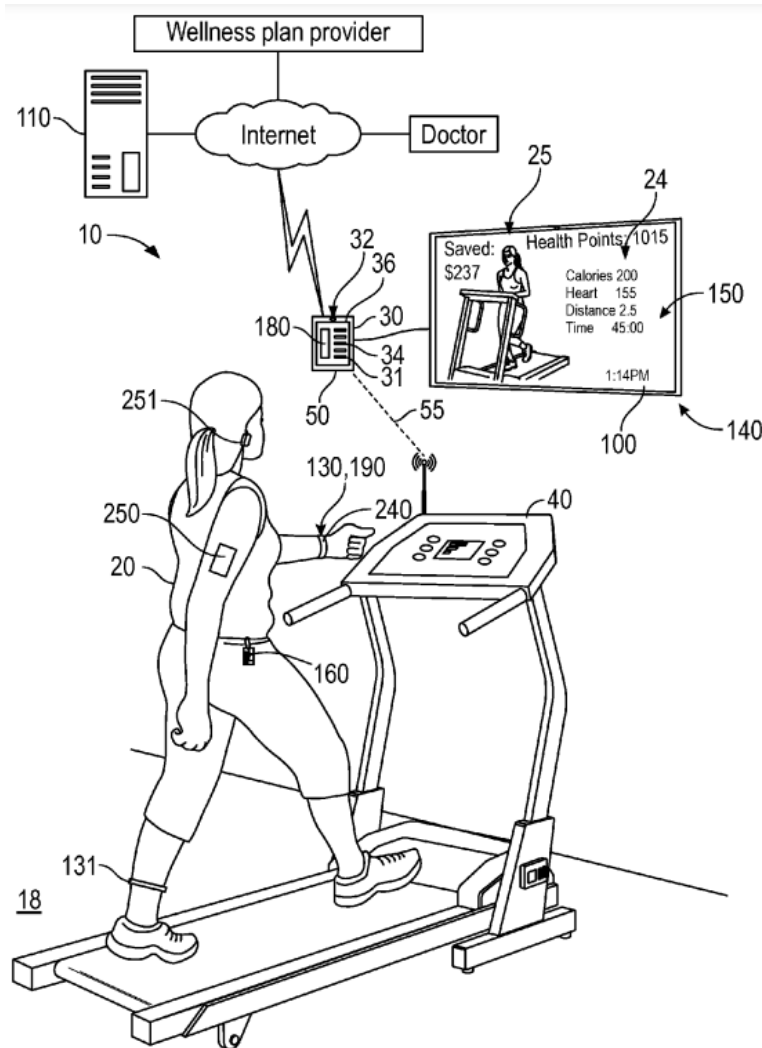


FIG. 1

Figure 1 shows a user exercising on treadmill 40 with camera 32 of electronic device 30 recording the exercise data. *Id.* at 13:7–30. When movement is detected by camera 32 (e.g., the user's shoulders moving up

and down), and the treadmill is moving by indicating movement at interface 55 with electronic device 30, camera 32 records still or video images of the user exercising and/or produces a live feed. *Id.* at 6:43–56, 13:20–24, 14:6–14. As long as the user continues to exercise on treadmill 40, camera 32 captures the user’s image at pre-set intervals. *Id.* at 6:49–60, 14:31–40.

The system displays exercise data 24 (including time 140 and duration 150) and motivational image 25 (which may be a thinner image of the user based on the intensity or duration of the user’s exercise). Ex. 1004, 5:41–58, 13:50–67. The user’s identity, motivational image, and exercise data may be sent over the Internet to a doctor, a wellness manager, or remote server 110. *Id.* at 6:63–7:8, 13:7–30.

3. Cox (Ex. 1005)

Cox’s electrical signature analysis (ESA) system for gait analysis senses current signals to fitness devices. Ex. 1005, 1:35–53. Fundamental characteristics of a person’s gait pattern can be measured using the ESA system without any restrictive or sophisticated instruments by providing the simple, direct ability to measure fundamental characteristics of gait patterns with no risk to subjects other than walking on a treadmill at comfortable speeds. *Id.* at 1:53–58. Cox’s ESA system uses a treadmill’s electric motor as a transducer to sense load variations caused by a person walking on the treadmill because “variations in walking styles produced many noticeable changes in the treadmill’s electrical signatures, thus demonstrating the sensitivity needed to perform human . . . gait analysis.” *Id.* at 2:51–64. Gait analysis is an essential, fundamental tool in physical medicine to assess and correct inefficient or dysfunctional gait patterns. *Id.* at 3:9–18. A treadmill can plug into Cox’s interface box 39, which includes a current transducer for

obtaining current signals and facilitates display of data on the treadmill. *Id.* at 4:32–37, Fig. 4. Cox also notes that, alternatively, its components can be built into a treadmill itself. *Id.* at 4:37–39.

Even walking on a treadmill with low impact can produce dramatic variations in the magnitude of electric current. Ex. 1005, 5:31–60. Software can convert the raw electric current data into stride profiles. *Id.* at 5:57–60.

E. Ground 1: Obviousness Based on Morris and Ray

Petitioner contends that the subject matter of claims 1–9, 12, and 14–20 would have been obvious over Morris and Ray. Pet. 16–56. Patent Owner disputes Petitioner’s showing for element 1[h] (PO Resp. 17–25), element 1[g] (*id.* at 25–26), and element 1[i] (*id.* at 26–27). Patent Owner contends that the deficiencies of element 1[h] also infect independent claim 12 (*id.* at 28), and that the deficiencies of both elements 1[h] and 1[i] infect independent claim 14 (*id.* at 28–29).¹⁰

For the reasons explained below, we determine that Petitioner has shown, by a preponderance of the evidence, that the subject matter of these claims would have been obvious over Morris and Ray to one of ordinary skill in the art before the effective filing date of the claimed invention.

1. Rationale to Combine and Reasonable Expectation of Success

Petitioner contends that a person of ordinary skill in the art would have been motivated to combine Morris and Ray by adding several of Ray’s

¹⁰ We find that Patent Owner has waived any argument contesting Petitioner’s contentions regarding other claim limitations, the rationale to combine, or reasonable expectation of success. See Paper 8 (Scheduling Order), 9 (“**Patent Owner is cautioned that any arguments not raised in the response may be deemed waived.**”); Inst. Dec. 23 (same).

features to Morris' treadmill (including Ray's camera, software instructions for validating user exercise data, its functionality of displaying a motivational image, and its ability to transmit exercise data to a remote location), and that the ordinarily skilled artisan would have had a reasonable expectation of success in achieving the proposed combination. Pet. 16–18.

Petitioner asserts that an ordinarily skilled artisan would have been motivated to combine Morris and Ray because they provide complementary teachings and address similar objectives. Pet. 16 (citing Ex. 1004, Abstr., 5:41–48, 8:22–26, 11:56–61, 13:20–30; Ex. 1006 ¶¶ 6, 25, 33, 35, Abstr.; Ex. 1002 ¶¶ 135–138). Petitioner also asserts that Morris contemplates use of an optical sensor, provides exercise data and “a human analog display that mimic[s] the user's bouncing motion,” and includes a signal processing and display system with the necessary capabilities to implement the combination. *Id.* at 16–17 (citing Ex. 1002 ¶¶ 139–143; Ex. 1006 ¶¶ 32–36, 50, 56–58, claims 29–37, Figs. 6, 11–12C); *see also id.* at 26–27 (asserting that “including multiple sensors in treadmills was a routine and well-known task”) (citing Ex. 1002 ¶¶ 159–162). Petitioner further asserts that Ray expressly teaches that “its user validation and motivation technology could be ‘easily and affordably merged’ into a treadmill.” *Id.* at 18 (quoting Ex. 1004, 9:55–57) (citing Ex. 1002 ¶¶ 143–144). Finally, Petitioner contends that an ordinarily skilled artisan would have been motivated to make the proposed combination because it would have improved Morris' treadmill to add both “Ray's motivational image that showed a thinner image of the user as the intensity and duration of exercise increased” and Ray's ability to share exercise data with a remote location. *Id.* (citing Ex. 1004, 7:11–22, 11:55–59, 13:50–57; Ex. 1006 ¶ 50; Ex. 1002 ¶¶ 138, 145); *see also id.* at 16 (arguing that detection of a user's presence could

provide benefits, including motivation (citing Ex. 1004, 8:22–26, 11:56–61; Ex. 1006 ¶ 25)), 41 (arguing that data transmission was “a well-known and routine task” (citing Ex. 1002 ¶¶ 188–189)).

Patent Owner does not dispute these contentions. *See* PO Resp.

We find that Petitioner has established that an ordinarily skilled artisan would have been motivated to improve Morris’ treadmill by adding Ray’s camera, software instructions for validating user exercise data, its functionality of displaying a motivational image, and its ability to transmit exercise data to a remote location, and that the ordinarily skilled artisan would have had a reasonable expectation of success. *See* Pet. 16–18, 26–27; Ex. 1002 ¶¶ 135–138, 140–145, 161, 189; *see also, e.g.*, Ex. 1004, 5:27–29, 7:11–22, 9:55–57.

2. *Independent Claim 1*¹¹

1[pre]–1[c]: “An exercise apparatus comprising: a base; an operating unit movable relative to the base; a motor coupled to the operating unit . . .”

Petitioner relies on Morris for these aspects of the claim. Pet. 21–24. In particular, Petitioner contends that Morris discloses treadmill 100, which has base 104, belt 102, and an electric motor for driving belt 102. *Id.* (citing Ex. 1006 ¶¶ 2, 7, 25, 27, 31–33, Abstr., claim 29, Figs. 1, 2, 6).

Patent Owner does not dispute these contentions. *See* PO Resp.

¹¹ For ease of presentation, we discuss some limitations of claim 1 out of order and/or combined with related limitations.

We are persuaded that Morris discloses elements 1[pre]–1[c].¹² Morris’ treadmill 100 includes base 104, belt 102, and an electric motor that operates belt 102. *E.g.*, Ex. 1006 ¶¶ 25, 31–33, Fig. 1.

1[d]: “a sensor operable to detect engagement of a user with the operating unit”

Petitioner relies on both Morris and Ray for element 1[d]. Pet. 24–27. Petitioner contends that Morris’ treadmill includes a reluctance sensor, including magnet 212 and induction coil 214, which detects user engagement. *Id.* at 24–25 (citing Ex. 1006 ¶¶ 27, 31, 33, Figs. 3A–B). Petitioner also contends that Ray discloses camera 32, which captures a user’s images and detects “when a user [is] on versus off the moving belt” by detecting movement “such as the user’s shoulders moving up and down.” *Id.* at 25–26 (quoting Ex. 1004, 14:6–14) (citing Ex. 1004, 6:53–55, 9:55–57, 10:36–50, 10:59–64, 13:20–24, 14:34–40, 15:55–65, 15:47–50,¹³ claim 1). In the proposed combination, Ray’s camera augments Morris’ reluctance sensor. *Id.* at 26–27.

Patent Owner does not dispute these contentions. *See* PO Resp.

We are persuaded that the Morris-Ray combination teaches element 1[d]. The combination includes both Morris’ reluctance sensor (i.e., magnet 212 and inductance coil 214) and Ray’s camera, and these sensors operate to detect engagement of a user with the operating unit (i.e., the

¹² We need not determine whether the preamble is limiting because Petitioner has shown that Morris discloses this aspect of the claim. *See Realtime Data*, 912 F.3d at 1375.

¹³ We have corrected a typographical error, which cited column 16 rather than column 15 as the source of a quote. *Accord* Inst. Dec. 17 n.10.

treadmill's belt). Ex. 1006 ¶¶ 27, 31, 33; Ex. 1004, 13:20–24, 14:6–14; *see* Ex. 1002 ¶ 160.

1[e]: “a controller in communication with the operating unit and the sensor”

Petitioner relies on Morris for element 1[e]. Pet. 27–28. Petitioner contends that Morris' FIT (fitness) processor 520 discloses the claimed controller. *Id.* at 27 (citing Ex. 1006, Fig. 6). In the alternative, Petitioner maps the claimed “controller” to the combination of translator board 518, FIT processor 520, and display processor 522, or to the combination of translator board 518 and FIT processor 520. *Id.* at 27–28 (citing Ex. 1006 ¶ 35; Ex. 1002 ¶¶ 163–165). In addition, Petitioner contends that Morris' processor(s) communicate with the user detect sensor and the treadmill belt to control a workout program based on the presence or absence of a user. *Id.* at 28 (citing Ex. 1006 ¶ 36, claims 24, 32).

Patent Owner does not dispute these contentions. *See* PO Resp.

We are persuaded that Morris discloses element 1[e]. Morris describes a controller (i.e., translator board 518, FIT processor 520, and display processor 522) that communicates with the sensors and the motor driving the treadmill belt. Ex. 1006 ¶¶ 35–36; *see also, e.g., id.* ¶¶ 32, 34.

1[h]: “wherein the controller is further configured to generate a validated exercise use data in response to movement of the operating unit relative to the base and the sensor does detect engagement of the user with the operating unit”

Petitioner relies on Morris and Ray for element 1[h]. Pet. 32–39. Petitioner contends that Morris displays exercise use data (such as a user's pace, distance, footfall force, and cadence) while the belt is moving. *Id.* at 32–34 (citing Ex. 1006 ¶¶ 40, 50–51, 53, Fig. 11; Ex. 1002 ¶¶ 174–176).

Petitioner further contends that “Ray made it explicit that validated exercise use data would only be produced while the user was being detected exercising.” *Id.* at 34. To that end, Petitioner submits that Ray generates and displays exercise data 24 (e.g., calories, heart rate, distance, and time) and a virtual image of the user (i.e., one that is “thinner, healthier, and more aesthetically pleasing” based on the intensity/speed of the user’s exercise).¹⁴ *Id.* at 34–36 (citing Ex. 1004, Abstr., 4:66–5:11, 5:23–29, 5:41–48, 10:59–67, 13:31–36, Fig. 1). According to Petitioner, an ordinarily skilled artisan would have understood Ray’s data to be validated exercise use data, and would have understood it to be generated while the belt is moving and the user is being detected (or would have found it obvious to do so). *Id.* at 36–38 (citing Ex. 1004, 3:47–51, 4:67–5:14, 5:23–29, 5:45–51, 6:53–57, 7:4–10, 8:1–8, 8:26–28, 10:59–67, 13:24–30, 14:6–14, Figs. 1–3; Ex. 1002 ¶¶ 177–182).

Patent Owner asserts that Morris and Ray each fail to teach or suggest “validated exercise use data.” PO Resp. 17–25. As for Morris, Patent Owner argues that Petitioner fails to show that “Morris’s controller validates distance or time *in response* to the sensor detecting engagement by the user with the [belt].” *Id.* at 19 (citing Ex. 2004 ¶ 59). Patent Owner also argues that Morris’ other data (e.g., pace, footfall force, and cadence) fails to meet the claim’s requirements because: (1) none of this data represents an amount of exercise, and (2) Petitioner fails to show that the controller validates this data in response to the sensor detecting user engagement. *Id.* at 18–19 (citing Ex. 2004 ¶¶ 56–58; Ex. 2005, 59:17–60:11); *see also id.* at 24–25

¹⁴ The parties use the term “virtual image” to refer to Ray’s motivational image. We use these terms interchangeably.

(citing Ex. 2004 ¶ 71). As for Ray, Patent Owner argues that Ray’s virtual image is not “exercise use data” because it does not represent an amount of exercise, explaining that “morphing the virtual image based on underlying ‘exercise use data’ does not make the virtual image ‘exercise use data.’” *Id.* at 20–23 (citing Ex. 2004 ¶¶ 61, 63–66; Ex. 2005, 22:6–7, 22:12–24:14, 33:8–22). Patent Owner further argues that Ray “says nothing about the operation of the controller changing or making a determination of the validity of time, distance, or calories in response to a sensor not detecting a user engaged with the moving operating unit,” but instead accumulates this data regardless of whether the user is on the treadmill. *Id.* at 23 (citing Ex. 2004 ¶ 67; Ex. 2005, 32:4–7, 38:19–39:2). Patent Owner also argues that Ray’s heart rate is not “exercise use data” because it does not represent an amount of exercise. *Id.* at 20 (citing Ex. 2004 ¶ 61).

Having considered the parties’ arguments and the evidence of record, we are persuaded that the Morris-Ray combination teaches (or at least suggests) element 1[h]. In particular, for the reasons explained below, we find that Ray teaches (or at least suggests) generating a motivational image, time, and distance (which each teach “exercise use data”)¹⁵ in response to detecting a user engaging with a moving treadmill belt. *See* Pet. 34–38. In addition, we are persuaded by Petitioner’s undisputed contentions that an ordinarily skilled artisan would have been motivated to incorporate these aspects of Ray into Morris with a reasonable expectation of success. *See*

¹⁵ We construe “exercise use data” as “data that would represent an amount of exercise of the user.” *Supra* § II.C.1. The parties agree that time and distance are each “exercise use data” (*see* PO Resp. 5; Pet. Reply 12), and we find that Ray’s motivational image is also “exercise use data,” as explained in more detail later in this section.

supra § II.E.1 (addressing rationale to combine and reasonable expectation of success); Pet. 37–38.

Ray teaches that its system “validate[s] the user’s identity and exercise achieved” and displays a “motivational image, such as a thinner representation of the user.” Ex. 1004, Abstr. To that end, Ray includes a camera that detects if a user is exercising and, if so, captures images of the user. *See, e.g., id.* at 6:53–56 (“[A]s long as the treadmill is moving the camera will operate to take their real time image while exercising. If the user stops exercising, the camera will no longer record images.”), 14:6–14 (“[M]ovement is sensed by the camera 32 (such as the user’s shoulders moving up and down), resulting in the set of instructions causing the camera 32 to periodically take a photo.”), 14:35–46 (“[A]s long as the user 20 continues exercising, the camera 32 will continue to capture the user’s image”). Ray uses the image captured by the camera in at least two ways. First, Ray uses the image (and the user’s exercise information) to generate a motivational image. *See, e.g., id.* at Abstr. (“[U]pon detection of movement by the camera, [Ray’s device] is adapted to display the motivational image”), 13:50–61 (explaining that the motivational image is determined using the camera’s image and “the speed or duration of the detection of movement of the user 20 by the camera 32”). Second, Ray uses the image to validate both the user’s identity and the amount of exercise actually performed by the user. *See, e.g., id.* at 6:43–46 (noting that using the camera allows “the user’s identification and method of exercise [to be] confirmed during the exercise routine”), 6:63–66 (“This information can be sent to someone in the medical industry or wellness manager to confirm the user’s amount of exercise and validating the user’s identity.”), 8:26–28 (“Using the validation process of the invention, the [user’s] identity and

exercise routine are confirmed simultaneously.”). Indeed, Ray notes that its system satisfies a need to “validat[e] the identity of the user and the exercise performed” in order to prevent a user from fraudulently claiming wellness program benefits and health insurance discounts for exercise that was not actually performed. *Id.* at 9:31–47; *see also id.* at 3:37–42.¹⁶

Based on these disclosures, we find that Ray teaches generating a motivational image in response to detecting a user exercising on a moving treadmill belt. *See, e.g.,* Ex. 1004, Abstr., 13:50–67, 17:62–18:19 (claim 1). In addition, we find that Ray generates the time and distance associated with the exercise actually performed by a user (*see, e.g., id.* at 5:46–48, 6:43–66, 8:26–28), and this teaches generating “validated exercise use data” in response to detecting a user exercising on a moving treadmill belt. *See also, e.g., id.* at Abstr. (Ray’s system “*validate[s]* the user’s identity and *exercise achieved*” (emphasis added)), 13:27–30 (transmitting “the time 140 and duration 150 of the exercise performed by the user”). Although Ray does not state *in haec verba* that its system generates time and distance in response to detecting the user exercising on the belt, we are persuaded that an ordinarily skilled artisan would have understood Ray in this manner.¹⁷ *See* Ex. 1002 ¶¶ 177–181. Moreover, even if Ray does not teach these claimed aspects, it suggests them—Ray repeatedly states that it uses the image taken by its camera to validate the exercise actually performed by the user, and it validates, displays and transmits the amount of exercise performed by the user. *See, e.g.,* Ex. 1004, 6:43–7:10, 8:26–28, 13:27–30;

¹⁶ Incidentally, the ’227 patent also seeks to prevent a user from submitting “faked” exercise data to insurance companies. *See* Ex. 1001, 1:18–2:19, 2:29–36.

¹⁷ We do not rely on inherency in this Decision.

see also Ex. 1002 ¶ 179; Ex. 1004, 9:40–47 (stating that the invention “validat[es] the identity of the user and the exercise performed” to solve the problem of people fraudulently submitting erroneous exercise data).

Patent Owner’s contrary arguments are unavailing. *See* PO Resp. 20–24; PO Sur-reply 6–8, 12–15. First, Patent Owner argues that Ray’s motivational image “is not ‘exercise use data’ because it does not represent an **amount** of exercise.” PO Resp. 20; *see also id.* at 5–6, 20–23; PO Sur-reply 6–7. We disagree.¹⁸ Ray’s motivational image changes based on the intensity and/or duration of the user’s workout by becoming “thinner and more appealing” as the user performs more exercise. *E.g.*, Ex. 1004, Abstr., 5:44–46; *see also id.* at 13:50–61. As a result, the motivational image conveys the intensity and/or duration of the user’s exercise, and consequently, it represents an amount of exercise. *See* Pet. Reply 5–6. Although the motivational image does not provide a precise measurement (*see* PO Resp. 20–23; PO Sur-reply 7), precision is not required (*see* Pet. Reply 6; *cf.* PO Sur-reply 8 (indicating that “exercise use data” need not be precise)). In addition, under the agreed construction (advanced by Patent Owner), “exercise use data” is data that would *represent* an amount of exercise, not data that *quantifies* the amount of exercise. Also, contrary to Patent Owner’s assertion (*see* PO Resp. 20; PO Sur-reply 6), Petitioner does, in fact, identify evidence in support of its position—namely, Ray.

¹⁸ Moreover, even if we had agreed that Ray’s motivational image does not represent an amount of exercise, we would still find that the combination satisfies element 1[h] given Ray’s disclosure (or at least suggestion) of generating validated exercise data (e.g., time and distance) in response to detecting the user exercising.

Second, Patent Owner argues that Ray's time and distance are not generated "in response to" detecting the user engaging with the moving belt, as required by element 1[h]. PO Resp. 23–24; *see* PO Sur-reply 13, 15. Specifically, according to Patent Owner, "Ray teaches that as long as the treadmill belt is moving and regardless of whether the user is on the treadmill, exercise data accumulates with no determination by the controller whether or what portion of the exercise data is valid or not." PO Resp. 23. Again, we disagree.¹⁹ One of the central purposes of Ray is to validate the amount of exercise performed by a user. *E.g.*, Ex. 1004, Abstr. (the system "validate[s] the . . . exercise achieved" by a user), 6:63–66 ("to confirm the user's amount of exercise"), 8:26–28 ("[T]he [user's] . . . exercise routine [is] confirmed."). Ray accomplishes this using its validation process, which captures a user's image only when the user is exercising. *E.g.*, *id.* at 6:43–66. Ray also transmits "the time 140 and duration 150 of the exercise performed by the user." *Id.* at 13:27–30. As a result, the context of Ray's disclosure makes it clear that Ray generates validated exercise information (e.g., time and distance) in response to detecting a user exercising (e.g., engaging with a moving belt). *See* Pet. Reply 12–14. At a minimum, as explained above, Ray suggests generating time and distance in response to detecting a user exercising.

Also, to the extent Patent Owner argues that Petitioner fails to show a "controller" that generates the claimed exercise use data (*see* PO Resp. 23–

¹⁹ Moreover, even if we had found that Ray does not teach or suggest generating validated time and distance in response to detecting a user exercising, we would still find that the combination satisfies element 1[h] given Ray's generation of a motivational image in response to detecting a user exercising.

24), this argument is unavailing because it fails to respond to Petitioner’s proposed combination, in which Morris’ controller generates data using techniques described in Ray (*see, e.g.*, Pet. 37–38; Pet. Reply 14–15).

We have considered the testimony of Mr. van der Weide, who agrees with Patent Owner (*see* Ex. 2004 ¶¶ 35, 60–71), but we give his testimony on these points little weight. Mr. van der Weide discusses Mr. Rawls’ testimony, but he does not meaningfully discuss Ray’s disclosure. *See id.* As a result, he does not reconcile his opinions with the apparently conflicting portions of Ray. In addition, Mr. van der Weide’s testimony is conclusory because he does not identify evidence or reasoning sufficient to support his opinion that Ray fails to teach or suggest these aspects of the claim. *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.”).

In addition, we disagree with Patent Owner’s argument that Mr. Rawls’ deposition testimony supports Patent Owner’s position. *See* PO Resp. 20 (citing Ex. 2005, 22:12–24:14), 22–23 (citing Ex. 2005, 22:6–7, 24:3–5), 23 (citing Ex. 2005, 32:4–7, 38:19–39:2). Mr. Rawls testifies that Ray’s motivational image represents an amount of exercise, albeit not a precise measurement or one described extensively by Ray. *See* Ex. 2005, 20:4–24:14. Mr. Rawls also notes that Ray’s system would continue to accumulate time and distance if the user departs from and returns to the treadmill between images captured by Ray’s camera. *See* Ex. 2005, 32:4–15, 36:6–39:3. This does not mean that Ray accumulates time and distance “regardless of whether the user is on the treadmill,” as Patent Owner contends (PO Resp. 23); rather, it simply shows that the accuracy of the data generated by Ray’s system is affected by how frequently the system

evaluates whether the user's exercise is detected. Stated differently, Ray generates validated time and distance in response to determining that a user is exercising, regardless of how frequently (or infrequently) that determination is made.

Finally, we do not address Patent Owner's remaining arguments because we do not rely upon the corresponding portions of the Petition. *See* PO Resp. 17–19 (arguing that Morris does not teach the claimed “exercise use data”), 20 (arguing that heart rate is not “exercise use data”), 21 (arguing that the '227 patent fails to teach that “any multimedia content is ‘exercise use data’”), 24–25 (arguing that pace, footfall force, and cadence are not “exercise use data”).

1[g]: “wherein the controller is configured to generate a non-validated exercise use data in response to movement of the operating unit relative to the base and the sensor does not detect engagement of the user with the operating unit”

Petitioner relies on Morris for element 1[g].²⁰ Pet. 39–40. Specifically, Petitioner contends that Morris discloses shutting down the treadmill after not detecting the user for a certain period of time (e.g., 6–8 seconds). *Id.* (citing Ex. 1006 ¶¶ 8, 45, Fig. 8 (steps 850–860)). Petitioner asserts that it would have been obvious that, in the proposed combination, “for at least the duration of before slowdown was initiated, exercise information that did not depend on the user's presence (e.g., time), would be generated in the absence of the user,” and that this information is non-validated exercise use data. *Id.* at 40 (citing Ex. 1002 ¶¶ 184–186). In

²⁰ Petitioner also contends that the claimed subject matter “was already known and admitted prior art.” Pet. 39 (citing *id.* at 72–73 (discussing Ground 3)). We do not rely upon that contention in this Decision.

addition, Petitioner contends that “continuing or not continuing to generate some exercise use data was one of two known options, and therefore picking one or the other would have been obvious.” *Id.* (citing Ex. 1002 ¶ 187).

Patent Owner argues that Petitioner fails to address the claim’s requirement that the non-validated exercise use data be generated “in response to” the sensor not detecting the user exercising. PO Resp. 25–26 (citing Ex. 2004 ¶¶ 72–73). Also, according to Patent Owner, “[n]othing in Petitioner’s argument or evidence demonstrates that the controller of Morris makes any determination or does any analysis about the validity of the time data generated during the slowdown period.” *Id.* at 26.

Having considered the parties’ arguments and the evidence of record, we are persuaded that Morris discloses element 1[g]. In response to determining that the user is not engaged with the moving belt, Morris’ controller generates time before implementing a controlled slowdown. Ex. 1004 ¶ 45, Fig. 9. We find that this time discloses the claimed “non-validated exercise use data.” *See* Pet. 39–40.

Specifically, “during a user’s workout,” Morris’ controller periodically queries the sensor “to determine whether or not [the] user is still present.” Ex. 1006 ¶ 45, Fig. 9 (step 850). The workout program continues if the user is still on the belt. *Id.* ¶ 45, Fig. 9 (step 862). But, if not, Morris’ controller alters the display to ask the user to return to his workout. *Id.* ¶ 45, Fig. 9 (step 852). Then, “[t]he user timeout counter increments (block 854), and the processor checks the counter to see if it has surpassed a threshold (block 856).” *Id.* ¶ 45. If the user returns, the display returns to normal, the workout continues, and the counter resets. *Id.* ¶ 45, Fig. 9 (steps 850, 862, 864). However, “[i]f the user does not return in time, the user timeout counter will ultimately meet the time delay (block 856) and trigger a

controlled slowdown (block 860) to stop the treadmill.” *Id.* ¶ 45. Morris states that the time delay associated with this process “is preferably at least about 6–8 seconds.” *Id.* During the six to eight seconds of this pre-slowdown process, Morris’ controller generates time in response to determining that the user is not engaged with the belt, and this time discloses the claimed “non-validated exercise use data.”

Patent Owner’s contrary arguments (*see* PO Resp. 25–26) are unavailing. Although Patent Owner argues that Petitioner fails to show that the data is generated “in response to” the sensor not detecting the user (*id.*), Morris clearly discloses that this pre-slowdown process (i.e., steps 852–860) occurs in response to the user not being detected (i.e., step 850). Ex. 1006, Fig. 9; *see also id.* ¶ 45. Patent Owner also argues that Petitioner fails to show that the controller determines the “validity of the time data” (PO Resp. 26), but the claim does not separately require that the controller “validate” the exercise use data. *See supra* § II.C.2 (addressing claim construction arguments); *also cf.* PO Resp. 6, 11–12 (Patent Owner’s proposed claim constructions do not expressly require the controller to validate the exercise use data).

1[f]: “a communication interface in communication with the controller”

1[i]: “wherein the controller transmits the validated exercise use data to the communication interface”

Petitioner relies on the Morris-Ray combination for elements 1[f] and 1[i]. Pet. 29–32, 41. For the claimed “communication interface,” Petitioner points to the components in Ray (such as interface 55) that allow the user’s motivational image and/or exercise data to be transmitted from the treadmill over the Internet via a live feed or to a storage device (such as a cloud-based

server). *Id.* at 30–31 (citing Ex. 1004, 3:46–51, 5:65–6:5, 6:67–7:10, 8:1–10, 13:31–36, 13:65–67, Fig. 3; Ex. 1002 ¶¶ 170–171); *see also id.* at 29 (discussing “communication interface” in the ’227 patent); 41 (asserting that Ray discloses sending the virtual image to third parties) (citing Ex. 1004, 3:46–50, 5:49–51, 7:4–10, 7:15–36, 13:7–9). Petitioner contends that it would have been obvious to incorporate Ray’s transmission functionality into Morris’s treadmill. *Id.* at 41 (citing Ex. 1002 ¶¶ 188–189); *see also id.* at 16–18 (addressing rationale to combine and reasonable expectation of success), 31–32.

In addition, Petitioner presents alternative mappings for the claimed “communication interface,” pointing to Morris’ display device 524, Morris’ display processor 522 communicating with its display device 524, and Ray’s display 34. Pet. 29–30 (citing Ex. 1004, 9:55–57, 12:59–67, 13:50–54, Figs. 1–3; Ex. 1006 ¶¶ 23–24, 35–36, Figs. 6, 11, 12A–12C).²¹ In connection with elements 1[g] and 1[h], Petitioner argues that Morris displays data, such as a user’s pace, distance, footfall force, and cadence, on display device 524. *Id.* at 32–33 (citing Ex. 1006 ¶¶ 50–51, 53, Fig. 11).

Patent Owner responds that “Petitioner fails to argue or submit evidence that Morris’s controller would transmit Ray’s virtual image to third parties.” PO Resp. 26–27 (emphasis omitted) (citing Ex. 2004 ¶ 74). Patent Owner also argues that “Petitioner’s cited evidence merely discloses the

²¹ Although Petitioner does not specifically address any of these alternative contentions in connection with element 1[i] (*see* Pet. 41), we understand the Petition to include these contentions: Petitioner identifies these alternative contentions in connection with element 1[f] (*see id.* at 29–30) and asserts that Morris and Ray disclose transmitting exercise use data to the display in connection with elements 1[g] and 1[h] (*see id.* at 32–36).

transmission of the user's actual image to a third party to validate the user's identity." *Id.* at 27.

Having considered the parties' arguments and the evidence of record, we are persuaded that the Morris-Ray combination teaches elements 1[f] and 1[i] in two alternative ways.

First, we are persuaded that an ordinarily skilled artisan would have understood Ray to have a "communication interface" (*see* Pet. 30) because Ray transmits the claimed exercise use data (time, distance, and the motivational image) to a remote location over the Internet.²² *See* Ex. 1004, 3:47–51, 5:65–6:5, 6:67–7:8, 13:7–9, 13:65–67, Fig. 3; Ex. 1002 ¶ 170. Specifically, Ray sends an "exercise report . . . via the internet to a health professional or wellness manager." Ex. 1004, 5:65–6:5; *see also, e.g., id.* at 8:40–45 (sending "duration of exercise" to third party), 13:7–19 (sending "data from the exercise machine 40" to doctor or wellness program through server 110), 13:27–30 (sending "time 140 and duration 150 of the exercise performed by the user 20" to server 110). Ray also states that the motivational image may be "broadcast to a remote location," such as a user's doctor or wellness manager. *Id.* at 5:49–52, 13:65–67; *see also, e.g., id.* at 13:7–19.

In addition, we are persuaded that the proposed combination includes Ray's communication interface, which receives the validated exercise use data from Morris' controller. Specifically, in the Morris-Ray combination, Morris' controller generates the exercise use data (including time, distance, and the motivational image) (*see supra* § II.E.1; Pet. 17–18, 37–38), and

²² Notably, the '227 patent states that the "communication interface" may be an Internet interface. Ex. 1001, 6:40–43 (*cited in* Pet. 29).

Ray's communication interface "receive[s] the generated exercise [use] data from, and under the control of, the controller in order to transmit to a storage device and/or to a third party" (Pet. 31–32).

Second, we are persuaded that Morris' display device 524 also teaches the claimed "communication interface"²³ (*see* Pet. 29) because it displays exercise use information. *See, e.g.*, Ex. 1006 ¶¶ 32 ("The processors . . . output some or all of the parameters to one or more displays 524, or the like."), 36 (noting that display 524 may "display indications of the presence or absence of a user"), 51 (describing display of exercise information such as distance), Fig. 11. In the Morris-Ray combination, the display device shows time, distance, and the motivational image. *See supra* § II.E.1; Pet. 16–18, 32–37.

Patent Owner's contrary arguments are unavailing. Patent Owner argues that Petitioner fails to show that Morris' controller is involved (*see* PO Resp. 26–27); however, Petitioner persuasively explains that the communication interface receives the data from Morris' controller, which generates the data (*see* Pet. 31–32; *see also id.* at 16–18, 32–37). Next, Patent Owner argues that Ray does not transmit the *motivational* image, but only transmits the user's *actual* image (*see* PO Resp. 27); however, Ray belies this argument. *See, e.g.*, Ex. 1004, 5:49–51 ("The thinner image is able to be transferred in real time while exercising via the internet to someone such as a doctor, wellness manager or the like.") (*cited in* Pet. 41), 13:7–19 (*cited in* Pet. 41), 13:65–67 (*cited in* Pet. 30). Patent Owner also appears to contend that, for element 1[i], Petitioner only relies on Ray's

²³ Notably, the '227 patent states that the "communication interface" may be a display device. Ex. 1001, 6:9–13 (*cited in* Pet. 29).

transmission of the image to third parties (*see* PO Sur-reply 17–18); however, Patent Owner misunderstands the Petition. Although Petitioner’s discussion of element 1[i] is terse, the preceding discussion of related elements 1[f]–1[g] sufficiently identifies and explains Petitioner’s alternative contentions. *See supra* n.21. Indeed, to ensure a clear record, we specifically identified these alternatives in connection with both elements 1[f] and 1[i] in the Institution Decision (*see* Inst. Dec. 20–21), and Patent Owner alleges no error in that assessment (*see* PO Resp.).

Conclusion as to Claim 1

For the reasons provided above, we are persuaded that one of ordinary skill in the art would have been motivated to combine the teachings of Morris and Ray as proposed by Petitioner and would have had a reasonable expectation of success in doing so. We also are persuaded that Morris and Ray, in combination, teach or suggest each element of independent claim 1.

Accordingly, we determine that Petitioner has shown, by a preponderance of the evidence, that the subject matter of claim 1 would have been obvious to one of ordinary skill in the art over Morris and Ray.

3. *Independent Claims 12 & 14 and
Dependent Claims 2–9 & 15–20*

Petitioner contends that the subject matter of independent claims 12 and 14 and dependent claims 2–9 and 15–20 would have been obvious over Morris and Ray. Pet. 41–56. Petitioner addresses each limitation of these claims and supports its contentions with analysis and evidence, referencing its earlier analysis of commensurate limitations in independent claim 1 as appropriate. *See id.*

Patent Owner relies on its arguments regarding claim 1 (*see* PO Resp. 27–29), but these arguments are unavailing for the reasons explained above. *See supra* § II.E.2 (analyzing claim 1). Also, Patent Owner argues that the combination fails to satisfy dependent claims 3 or 4 because it does not generate distance or time in the manner required by element 1[h] (PO Resp. 23–24); however, as explained above in connection with element 1[h], we disagree and instead find that Ray teaches (or at least suggests) generating both time and distance in response to detecting a user engaging with a moving treadmill belt. For independent claim 12, Patent Owner relies on its arguments regarding claim 4 and element 1[h] (PO Resp. 28), and for independent claim 14, Patent Owner relies on its arguments regarding elements 1[h] and 1[i] (*id.* at 28–29); however, these arguments are unavailing for the reasons explained above in connection with those elements.

Having considered the record, we are persuaded by Petitioner’s contentions regarding these claims. We find that an ordinarily skilled artisan would have been motivated to combine these references in the manner proposed by Petitioner, as explained above. *See supra* § II.E.1 (addressing motivation to combine Morris and Ray). In addition, we are persuaded that each limitation of independent claims 12 and 14 would have been obvious over the proposed Morris-Ray combination. *See* Pet. 53–54; *supra* § II.E.2 (addressing claim 1).

In addition, we are persuaded by Petitioner’s undisputed showing that each additionally-recited limitation of dependent claims 2–9 and 15–20 would have been obvious over the proposed Ray-Morris combination. Regarding claims 2–4 and 15–17, Ray teaches (or at least suggests) generating and recording time and distance while the sensor detects the user

engaging with a moving treadmill belt. *See* Pet. 41–45, 54–55; *supra* § II.E.2 (addressing element 1[h]). Regarding claims 5 and 18, Ray teaches that the communication interface is an internet interface. *See* Pet. 45–47, 55; *supra* § II.E.2 (addressing elements 1[f] and [i]). Regarding claims 6 and 19, Morris teaches that the communication interface is a display device. *See* Pet. 47–49, 55; *supra* § II.E.2 (addressing elements 1[f] and [i]). Regarding claims 7–9, Morris uses reluctance sensors to detect a user’s footfalls on the treadmill belt, and an ordinarily skilled artisan would have found it obvious that Morris’ reluctance sensor was a pressure sensor. *See* Pet. 49–53; *supra* § II.E.2 (addressing element 1[d]). Regarding claim 20, Ray’s camera is an optical sensor. *See* Pet. 56; *supra* § II.E.2 (addressing element 1[d]).

Accordingly, we conclude that Petitioner has shown, by a preponderance of the evidence, that the subject matter of claims 12 and 14 and dependent claims 2–9, 12, and 14–20 would have been obvious to one of ordinary skill in the art over Morris and Ray.

F. Ground 2: Obviousness Based on Morris, Ray, and Cox

Claims 10, 11, 13, and 20 depend (directly or indirectly) from independent claim 1, 12, or 14. Petitioner contends that the subject matter of these dependent claims would have been obvious over Morris, Ray, and Cox. Pet. 56–65.

Patent Owner argues that these claims are not obvious for the reasons argued in connection with Ground 1. PO Resp. 32–33. In addition, Patent Owner argues that Petitioner’s contentions fail to sufficiently address the claims from which these claims depend (*id.* at 29–30), and Patent Owner argues that Petitioner fails to provide a sufficient rationale to combine Cox with Ray and Morris (*id.* at 30–32).

For the reasons explained below, we determine that Petitioner has shown, by a preponderance of the evidence, that the subject matter of these claims would have been obvious to one of ordinary skill in the art over Morris, Ray, and Cox.

1. Rationale to Combine and Reasonable Expectation of Success

Petitioner contends that an ordinarily skilled artisan would have been motivated to combine Cox with the Morris-Ray combination by adding Cox's current sensor and gait analysis software, and that the ordinarily skilled artisan would have had a reasonable expectation of success in achieving this combination. Pet. 56–59.

In support, Petitioner asserts that Morris, Ray, and Cox provide complementary teachings and address similar objectives. Pet. 56 (citing Ex. 1005, Abstr., 2:56–3:9, 3:30–37; Ex. 1004, 9:27–47; Ex. 1002 ¶¶ 232–233). Petitioner also asserts that a skilled artisan would have been motivated to combine the references in order to “provide an improved motivational image . . . that can help correct and improve a user's exercise form.” *Id.* at 57. According to Petitioner, an ordinarily skilled artisan would have been guided by Morris' desire to evaluate a user's gait and Cox's statement that its gait analysis techniques could be used to increase the accuracy of gait analysis. *Id.* at 58 (citing Ex. 1005, 3:9–13, 3:19–21; Ex. 1006 ¶ 9). In addition, Petitioner asserts that Cox's current sensor “was an inexpensive option that would have provided redundancy and accuracy,” and “the presence of the user could be detected collaboratively using the three techniques of Ray, Morris and Cox.” *Id.* at 58–59 (citing Ex. 1002 ¶ 236). Petitioner submits that Ray and Morris disclose the benefits of using multiple sensors to provide feedback to a user, and that Cox teaches that its

current sensor could be integrated into a standard treadmill. *Id.* at 57 (citing Ex. 1004, 10:24–35, 11:21–55, 16:1–43; Ex. 1006 ¶¶ 9, 33; Ex. 1005, 1:54–61, 4:32–39).

Patent Owner argues that a skilled artisan would not have been motivated to combine Cox with Morris and Ray for these reasons. PO Resp. 30–32; *see also* PO Sur-reply 19–20. In particular, Patent Owner argues that Petitioner identifies nothing in Ray, Morris, or any other reference suggesting “that Ray needed improvements to its motivational image” or “that Morris needed another sensor to improve its ability to analyze gait.” PO Resp. 31–32. Patent Owner also argues that the Petition fails to explain: how adding a current sensor would improve Ray’s motivational image, and why an ordinarily skilled artisan would be motivated to use three techniques to detect the presence of a user. *Id.* Patent Owner also submits that adding another sensor would be costly and redundant. *Id.* (citing Ex. 2004 ¶ 83).

Having reviewed the record and the parties’ arguments, we are persuaded that an ordinarily skilled artisan would have been motivated to improve the Morris-Ray combination by adding Cox’s current sensor and gait analysis software in order to improve the user’s motivational image so that the image could be used to correct and improve a user’s exercise form. *See* Pet. 56–59. Morris seeks to provide gait analysis to a user, and Cox states that its techniques are “inexpensive” and “increase accuracy” of gait analysis. Ex. 1006 ¶ 9; Ex. 1005, 2:56–3:9, 3:19–21; *see also* Ex. 1005, 1:53–61 (describing other benefits of Cox technique), 3:30–37 (noting particular benefits for runners). In addition, both Morris and Ray contemplate the use of multiple sensors to capture data regarding an exercising user (Ex. 1006 ¶¶ 9, 33; Ex. 1004, 11:21–55), and all three

references seek to increase the amount of exercise-related information that is provided to a user of a treadmill (*e.g.*, Ex. 1006 ¶ 9; Ex. 1004, Abstr.; Ex. 1005, 2:65–3:9, 4:32–39). As a result, we are persuaded that an ordinarily skilled artisan would have understood that Cox’s current sensor and gait analysis software would improve the treadmill of the Morris-Ray combination. *See also* Ex. 1002 ¶¶ 232–241. We also find that an ordinarily skilled artisan would have had a reasonable expectation of success in making the proposed combination. *See* Ex. 1002 ¶¶ 232–233, 235; *see also* Ex. 1005, 1:54–61.

We credit Mr. Rawls’ testimony on these issues (*see* Ex. 1002 ¶¶ 232–241) because he provides a reasonable explanation supported by citations to the evidence. Mr. van der Weide disagrees with Mr. Rawls, but only provides conclusory statements that fail to address the substance of Mr. Rawls’ explanation. *See* Ex. 2004 ¶¶ 82–85. As a result, we assign little weight to Mr. van der Weide’s testimony on these points. *See* 37 C.F.R. § 42.65(a).

Patent Owner’s contrary arguments are unavailing. *See* PO Resp. 30–32. First, Patent Owner argues that “Petitioner identifies nothing in Ray[,], [Morris,] or any other reference suggesting” the motivation articulated by Petitioner (*id.* at 31–32); however, we disagree because, as noted above, Morris seeks to provide gait analysis to a user, and Cox describes the benefits of its gait analysis techniques (*e.g.*, Ex. 1006 ¶ 9; Ex. 1005, 2:56–3:9, 3:19–21). Furthermore, contrary to Patent Owner’s assumption, there is no requirement that the motivation to combine appear in the references themselves. *See KSR*, 550 U.S. at 418–19 (holding the teaching-suggestion-motivation test is not a prerequisite for concluding that a claim is obvious). Second, Patent Owner argues that Petitioner’s explanation fails to

sufficiently explain *why* an ordinarily skilled artisan would have been motivated in this way (*see* PO Resp. 31–32; PO Sur-reply 20), but we disagree for the reasons explained in our analysis above. Finally, Patent Owner argues that adding Cox’s sensor would be “costly” and unnecessary. *See* PO Resp. 31–32. But Patent Owner fails to provide any details, supporting evidence, or discussion of the alleged increased cost, and Cox indicates that its technique is “inexpensive.” Ex. 1005, 2:65–3:4. Moreover, even if the addition of Cox’s technique would add cost, Patent Owner does not sufficiently explain why such a tradeoff would undercut Petitioner’s articulated motivation to combine. *See Intel Corp. v. Qualcomm Inc.*, 21 F.4th 784, 795 (Fed. Cir. 2021) (stating that “simultaneous advantages and disadvantages do not necessarily obviate motivation to combine” (cleaned up)); *In re Fulton*, 391 F.3d 1195, 1200 (Fed. Cir. 2004) (The “case law 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.”).

2. *Dependent Claims 10, 11, 13, and 20*

For claims 10 and 13, Petitioner contends that Cox discloses a current sensor connected to a treadmill’s electric motor to detect an input current used by the motor and to detect engagement of the user with the operating unit. Pet. 60–62 (citing Ex. 1005, 1:45–52, 2:1–8, 2:16–17, 2:26, 3:49–56, 4:14–26, 4:32–39, 4:40–54, Figs. 1, 3, 5); *see also id.* at 59. Petitioner asserts that it would have been obvious to include this feature in the Morris-Ray treadmill to detect the user more accurately. *Id.* at 62 (citing Ex. 1002 ¶¶ 242–245).

For claim 11, Petitioner contends that Cox’s ESA system analyzed fluctuations in the input current to detect user engagement and to build a stride profile to calculate exercise metrics. Pet. 63–64 (citing Ex. 1005, 2:1–8, 3:51–53, 4:41–44, 5:33–38, 5:56–67, Table 1, Fig. 8). Petitioner asserts that it would have been obvious to use this feature in the Morris-Ray treadmill to determine whether a user is engaged with the treadmill. *Id.* at 64–65 (citing Ex. 1005, 2:1–8, 5:39–45, 5:56–67, Table 1, Fig. 8; Ex. 1002 ¶¶ 236–238).

For claim 20, Petitioner contends that Morris teaches a pressure sensor, Cox teaches a current sensor, and Ray describes detecting a user’s engagement with various sensors. Pet. 65 (citing *id.* at 24–27, 53–54, 60–62; Ex. 1006 ¶ 33; Ex. 1004, 16:1–10; Ex. 1002 ¶¶ 64–83, 250).

Patent Owner argues that Petitioner addresses the additionally-recited limitations of claims 8, 9, and 18, “but fails to specify where the other elements of the claims are found.” PO Resp. 29–30. Patent Owner also relies upon its arguments for independent claims 1, 12, and 14, from which these claims depend (*id.* at 32–33), but those arguments are unavailing for the reasons discussed above in connection with those claims (*see supra* §§ II.E.2–3).

Having considered the record, we are persuaded by Petitioner’s contentions regarding these claims. We find that an ordinarily skilled artisan would have been motivated to combine these references in the manner proposed by Petitioner, for the reasons explained above. *See supra* § II.F.1 (addressing motivation to combine and reasonable expectation of success). We also find the Morris-Ray-Cox combination teaches or suggests each limitation of these claims. In particular, we are persuaded by Petitioner’s contentions that the proposed combination teaches or suggests each

limitation of the independent claims (*see supra* § II.E.2–3), and we are persuaded by Petitioner’s undisputed contentions that the proposed combination teaches the additionally-recited limitations in these dependent claims (*see* Pet. 60–65). Specifically, as to claims 10 and 13, the proposed Morris-Ray-Cox combination includes a current sensor and its controller analyzes the input current to detect a user exercising. *See* Pet. 59–62; Ex. 1005, 3:49–56, 4:32–54; Ex. 1002 ¶¶ 240–245. As to claim 11, Cox’s gait analysis analyzes fluctuations in the input current, and as to claim 20, Cox’s sensor is a current sensor. *See* Pet. 63–65; Ex. 1005, 4:41–44, 5:33–38, 5:56–67.

We do not agree with Patent Owner’s argument that Petitioner fails to sufficiently address the “other” claim limitations. *See* PO Resp. 29–30. Claims 10 and 11 depend from independent claim 1; claim 13 depends from independent claim 12; and claim 20 depends from independent claim 14. Consequently, each of claims 10, 11, 13, and 20 includes the limitations of its corresponding independent claim. It appears that Patent Owner’s argument is that Petitioner fails to sufficiently address the independent claims’ limitations when addressing the dependent claims (*see id.*), but this argument is misplaced. The Petition clearly addresses each limitation of each independent claim, and it explains why those limitations are taught or suggested by the Morris-Ray combination. *See* Pet. 18–41, 53–54. In context, it is clear that the Petition relies upon that analysis to show that dependent claims 10, 11, 13, and 20 would have been obvious over the Morris-Ray-Cox combination.

Accordingly, we conclude that Petitioner has shown, by a preponderance of the evidence, that the subject matter of dependent

claims 10, 11, 13, and 20 would have been obvious to one of ordinary skill in the art over Morris, Ray, and Cox.

G. Other Grounds

Petitioner also presents a set of grounds that point to Ray and AAPA instead of Ray and Morris. *See* Pet. 91. In particular, Petitioner contends: the subject matter of independent claims 1 and 14 and dependent claims 2–6 and 15–20 would have been obvious over Ray and AAPA; dependent claims 10, 11, and 20 would have been obvious over Ray, AAPA, and Cox; independent claim 12 and dependent claims 7–9 would have been obvious over Ray, AAPA, and Daly; and dependent claim 13 would have been obvious over Ray, AAPA, Daly, and Cox. *Id.* at 65–89.

We have already found all challenged claims to be unpatentable (*see supra* §§ II.E–F), so we need not (and do not) address whether Petitioner has shown the claims to be unpatentable based on these alternative grounds. *See SAS Inst. Inc. v. Iancu*, 138 S. Ct. 1348, 1359 (2018) (holding a petitioner “is entitled to a final written decision addressing all of the claims it has challenged”); *Boston Sci. Scimed, Inc. v. Cook Grp. Inc.*, 809 F. App’x 984, 990 (Fed. Cir. 2020) (non-precedential) (recognizing that the “Board need not address issues that are not necessary to the resolution of the proceeding” and, thus, agreeing that the Board has “discretion to decline to decide additional instituted grounds once the petitioner has prevailed on all its challenged claims”).

III. CONCLUSION²⁴

Based on the evidence presented with the Petition, the evidence introduced during the trial, and the parties' respective arguments, Petitioner has shown by a preponderance of the evidence that claims 1–20 are unpatentable.

²⁴ 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*, 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).

In summary:

Claims	35 U.S.C. §	Reference(s)/ Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1–9, 12, 14–20	103	Morris, Ray	1–9, 12, 14– 20	
10, 11, 13, 20	103	Morris, Ray, Cox	10, 11, 13, 20	
1–6, 14, 20	103	Ray, AAPA ²⁵		
10, 11, 20	103	Ray, AAPA, Cox		
7–9, 12	103	Ray, AAPA, Daly		
13	103	Ray, AAPA, Daly, Cox		
1–9, 12, 14–20	103	Ray, AAPA, Cox		
Overall Outcome			1–20	

²⁵ We do not address the contentions that the challenged claims would have been obvious over Ray in view of AAPA (alone or in combination with Cox and/or Daly). *See supra* § II.G.

IV. ORDER

Accordingly, it is

ORDERED that claims 1–20 of U.S. Patent No. 10,032,227 B2 are determined to be unpatentable; and

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

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Patent 10,032,227 B2

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