

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,
Petitioner,

v.

LBT IP I LLC,
Patent Owner.

IPR2020-01193
Patent 8,421,619 B2

Before JOHN A. HUDALLA, SHEILA F. McSHANE, and
JULIET MITCHELL DIRBA, *Administrative Patent Judges*.

DIRBA, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
Denying Patent Owner's Motion to Amend
35 U.S.C. § 318(a)

On March 4, 2021, we instituted an *inter partes* review of claims 1–20 of U.S. Patent No. 8,421,619 B2 (Ex. 1001, “the ’619 patent”). Paper 9 (“Institution Decision” or “Inst. Dec.”). Having considered the full record at trial, we determine that challenged claims 1–20 the ’619 patent are unpatentable under 35 U.S.C. § 103(a). We also deny Patent Owner’s Revised Motion to Amend.

I. BACKGROUND

A. History of this Proceeding

Apple Inc. (“Petitioner”) filed a Petition seeking institution of an *inter partes* review of claims 1–20 of the ’619 patent (Paper 1 (“Pet.”)), and Petitioner submitted a declaration from Mr. Scott Andrews in support (Ex. 1003). LBT IP I LLC (“Patent Owner”) filed a Preliminary Response. Paper 8 (“Prelim. Resp.”). After reviewing the preliminary record, we determined that Petitioner had demonstrated a reasonable likelihood that it would prevail in establishing the unpatentability of all challenged claims, and we instituted an *inter partes* review of all challenged claims on all grounds asserted in the Petition. Inst. Dec.

During trial, Patent Owner filed a Response (Paper 16, “PO Resp.”), Petitioner filed a Reply (Paper 24, “Pet. Reply”), and Patent Owner filed a Sur-reply (Paper 29, “PO Sur-reply”).

In addition, Patent Owner filed a contingent Motion to Amend proposing to substitute claims 21–40 for claims 1–20, respectively, if we are to find any original claims unpatentable. Paper 17 (“MTA”). Petitioner filed an Opposition to the Motion to Amend (Paper 25 (“MTA Opp.”)), along with a supplemental declaration by Mr. Andrews (Ex. 1077). We then

issued Preliminary Guidance on Patent Owner’s Motion to Amend (Paper 27 (“PG”)), pursuant to Patent Owner’s request (*see* MTA 2).

After receiving our Preliminary Guidance, Patent Owner filed a Revised Motion to Amend in which it proposed revised substitute claims 21–40 for claims 1–20, respectively, if we were to find any original claims unpatentable. Paper 30 (“RMTA”). Petitioner opposed Patent Owner’s Revised Motion to Amend (Paper 33 (“RMTA Opp.”)) and submitted a second supplemental declaration by Mr. Andrews (Ex. 1081). Patent Owner filed a reply (Paper 38 (“RMTA Reply”)), and Petitioner filed a sur-reply (Paper 39 (“RMTA Sur-reply”)).

An oral hearing in this proceeding was held on January 7, 2022, and a transcript of the hearing is included in the record. Paper 40 (“Tr.”).

B. Related Matters

The parties identify a district court proceeding that involves the ’619 patent: *LBT IP I LLC v. Apple Inc.*, 1:19-cv-01245 (D. Del.). Pet. 75; Paper 3, 2 (Patent Owner Mandatory Notices).

In addition, Petitioner filed petitions challenging the following four patents, which are related to the ’619 patent: (1) U.S. Patent No. 8,497,774 (IPR2020-01189); (2) U.S. Patent No. 8,542,113 (IPR2020-01190); (3) U.S. Patent No. 8,102,256 (IPR2020-01191); and (4) U.S. Patent No. 8,421,618 (IPR2020-01192). *See* Pet. 75. Contemporaneously with this Decision, the Board enters final written decisions in each of those proceedings.

C. The Grounds

We instituted trial on the following grounds of unpatentability:

Claim(s) Challenged	35 U.S.C. §¹	Reference(s)/Basis
1, 5, 6, 8–11, 15–16, 18–20	103(a)	Miranda-Knapp, ² Miller ³
2	103(a)	Miranda-Knapp, Miller, Vaganov ⁴
3, 4, 12–14	103(a)	Miranda-Knapp, Miller, Cervinka ⁵
7, 17	103(a)	Miranda-Knapp, Miller, Herrero ⁶

D. Summary of the '619 Patent

The '619 patent is titled “Apparatus and Method for Determining Location and Tracking Coordinates of a Tracking Device.” Ex. 1001, code (54). The '619 patent issued from Application No. 13/356,643 (“the '643 application”), filed on January 23, 2012, which is a divisional of Application No. 11/969,905 (“the '905 application”), filed on January 6, 2008. *Id.* at codes (22), (62).

The '619 patent is directed to an apparatus to monitor location coordinates of an electronic tracking device. Ex. 1001, Abst. Figure 1, reproduced below, depicts a schematic of the electronic tracking device.

¹ The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125 Stat. 284, 285–88 (2011), revised 35 U.S.C. §§ 102, 103, 112 effective March 16, 2013. Because the challenged patent was filed before March 16, 2013, we refer to the pre-AIA versions of §§ 102, 103, and 112.

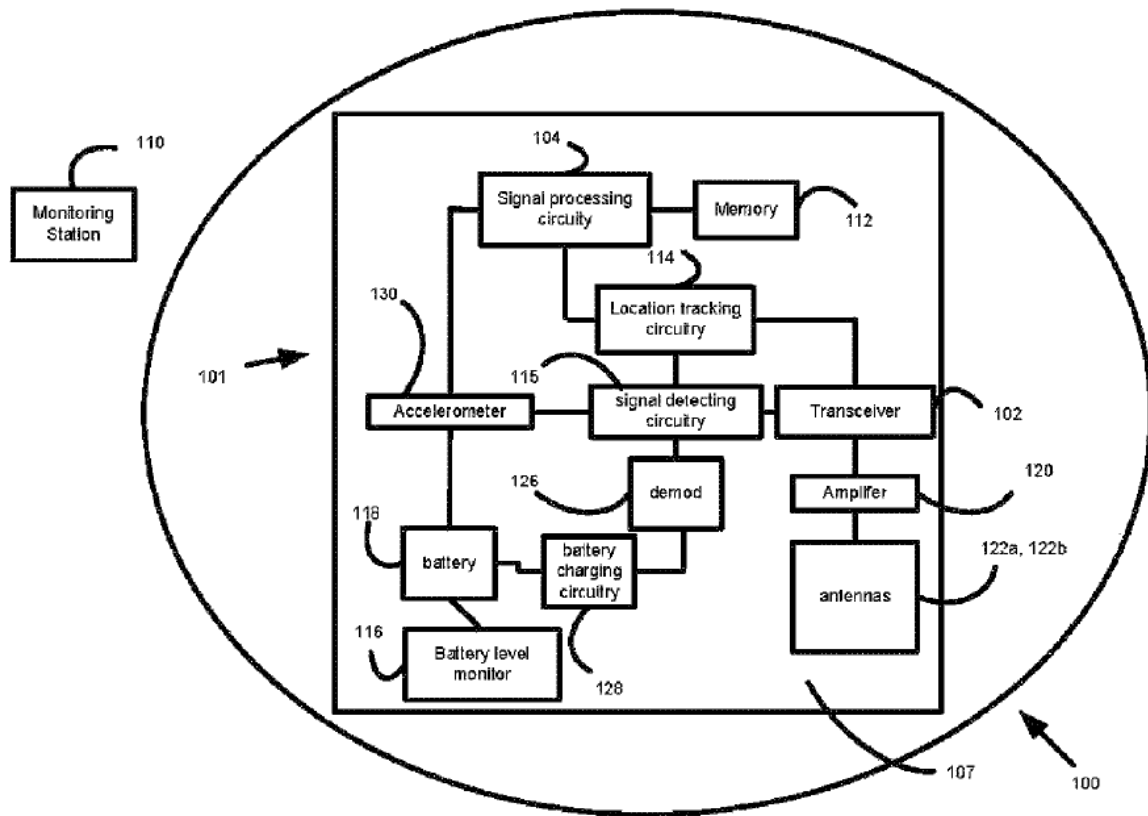
² US 6,940,407 B2, issued September 6, 2005 (Ex. 1004).

³ US 2006/0119508 A1, published June 8, 2006 (Ex. 1011).

⁴ US 2006/0272413 A1, published December 7, 2006 (Ex. 1008).

⁵ US 7,053,823 B2, issued May 30, 2006 (Ex. 1009).

⁶ US 2008/0266174 A1, published October 30, 2008 (Ex. 1010).



As depicted in the schematic of Figure 1, reproduced above, tracking device 100 contains electronic components 101 such as transceiver 102, signal processing circuitry 104 (e.g., a microprocessor or other signal logic circuitry), and accelerometer 130. *Id.* at 5:50–53. Tracking device 100 also includes location tracking circuitry 114—for example, global positioning system (GPS) logic circuitry—that “calculates location data received and sends the data to signal processing circuitry.” *Id.* at 6:12–14, 6:16–17; *see id.* at 5:62–66 (signal processing circuitry 104 determines location coordinates).

Accelerometer 130 may determine if tracking device 100 is stationary for a period of time (Ex. 1001, 8:13–19), and using such a determination, tracking device 100 may transmit its last known location without activating location tracking circuitry 114 (*id.* at 8:19–29). “Advantageously, in this

embodiment, when electronic tracking device 100 does not utilize and require GPS circuitry, e.g., location tracking circuitry 114, or functionality, the power resources are preserved of battery 118 in contrast to many conventional GPS communication systems, which continue powering-on GPS circuitry.” *Id.* at 8:29–34.

In addition, tracking device 100 may include circuitry (e.g., processing circuitry 104) that recognizes “programmed motions received by accelerometer . . . and transmits an alert message . . . upon receiving a recognized motion pattern.” Ex. 1001, 8:45–51. For example, tracking device 100 may detect tapping against the device in an “SOS tap cadence” (*id.* at 8:51–57), spins, turns, or flips of the device (*id.* at 8:59–67), or physical impacts that indicate the device has fallen (*id.* at 9:6–30).

E. Challenged Claims

The Petition challenges all claims of the ’619 patent. Claims 1, 11, and 20 are independent and recite similar subject matter. Claims 2–10 depend (directly or indirectly) from claim 1, and claims 12–19 depend (directly or indirectly) from claim 11.

Independent claim 1 is illustrative:

1. [pre] A portable electronic tracking device to monitor location coordinates of one or more individuals and objects, the device comprising:

[a] transceiver circuitry to receive at least one portion of a receive communication signal comprising location coordinates information;

[b] accelerometer circuitry to measure displacements of the portable electronic tracking device, wherein the displacements comprise movements of an object or individual associated with the device;

[c] a battery power monitor configured to activate and deactivate at least one portion of signaling circuitry in response to the accelerometer circuitry detecting a substantially stationary position of the electronic tracking device since last known location coordinate measurement; and

[d] processor circuitry configured to process the displacements, to associate the displacements with a specified pattern, and to generate an alert message in response to the specified pattern.

Ex. 1001, 10:21–40 (reference letters added).

II. ANALYSIS OF PATENTABILITY

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). That burden never shifts to the patentee. *Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015).

A patent claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are “such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The 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.⁷ *Graham v. John*

⁷ The record does not include allegations or evidence of objective indicia of obviousness or nonobviousness.

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*, 550 U.S. at 418.

A. The Level of Ordinary Skill in the Art

The Petition states that the level of ordinary skill in the art corresponds to “(i) a Bachelor degree (or higher degree) in Electrical Engineering, Computer Engineering, Computer Science, or an equivalent degree and (ii) at least one year of experience working in the field of with at least two years of experience in GPS navigation, dead reckoning, portable tracking devices, or related technologies.” Pet. 5–6 (citing Ex. 1003 ¶¶ 29–31).

Relying on Petitioner’s proposal, the Institution Decision states:

[A] person of ordinary skill in the art would have: (1) a bachelor’s degree in electrical engineering, computer engineering, computer science, or an equivalent degree, and (2) two years of experience in or with GPS navigation, dead reckoning, portable tracking devices, or related technologies.

Inst. Dec. 7; *see id.* at 6–7 (identifying and explaining differences from Petitioner’s proposal). At trial, “Patent Owner adopts the Board’s definition of the person of ordinary skill in the art” (PO Resp. 4; *see* RMTA 20), and Petitioner did not further address it (*see* Pet. Reply).

Accordingly, we adopt the level of ordinary skill articulated in the Institution Decision. This level of skill is supported by the testimony of Mr. Andrews and is consistent with the ’619 patent specification and the asserted prior art. *See Ruiz v. A.B. Chance Co.*, 234 F.3d 654, 666–67 (Fed. Cir. 2000) (identifying factors); *see also Okajima v. Bourdeau*, 261 F.3d

1350, 1355 (Fed. Cir. 2001) (The “level of skill in the art is a prism or lens through which a judge, jury, or the Board views the prior art and the claimed invention.”).

B. 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) (2019).

The Petition states that “no claim terms require express construction to resolve the grounds presented.” Pet. 9. In the Institution Decision, we determined that no terms required express construction at that stage of the proceeding. Inst. Dec. 7–8. At trial, neither Patent Owner nor Petitioner advanced any express construction of any term or phrase in the challenged claims. *See* PO Resp.; Pet. Reply.

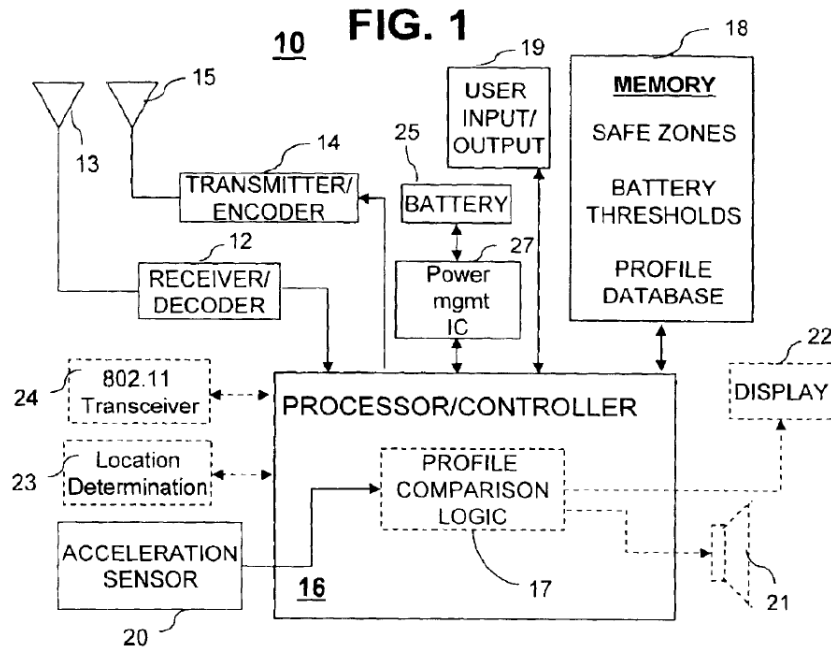
We determine that we need not expressly construe any claim terms or phrases given the issues presented in this proceeding. *See, e.g., Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (“[W]e need only construe terms ‘that are in controversy, and only to the extent necessary to resolve the controversy.’” (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

C. Summary of Prior Art

1. Miranda-Knapp (Ex. 1004)

Miranda-Knapp describes a method of detecting when a portable communication device (such as a cell phone) has been dropped or misplaced and then notifying the user of the device’s location. Ex. 1004, 1:12–32,

2:33–51, code (54), Abst. Miranda-Knapp’s exemplary device 10 is illustrated in Figure 1, shown here:



As shown above, Figure 1 is a block diagram of device 10 (e.g., a phone) that shows its basic components. Ex. 1004, 2:16–18, 2:52–55, Fig. 1. Device 10 includes a transceiver (i.e., receiver/decoder 12 and transmitter/encoder 14) and may optionally include a second transceiver for shorter range communications (i.e., 802.11 transceiver 24). *Id.* at 2:57–63. It also includes processor 16 (and associated logic module 17), memory 18, and acceleration sensor 20 (e.g., an accelerometer). *Id.* at 2:56–57, 3:4–16. Device 10 further includes location module 23, which can use GPS technology to determine the location of device 10 (*id.* at 3:21–23, 4:47–50), and power management integrated circuit (IC) 27 to monitor battery voltage (*id.* at 2:67–3:2).

In operation, Miranda-Knapp’s device monitors the accelerometer’s output: if the acceleration remains below a threshold for a period of time (such as 48 hours), then the device concludes that “the phone has not been

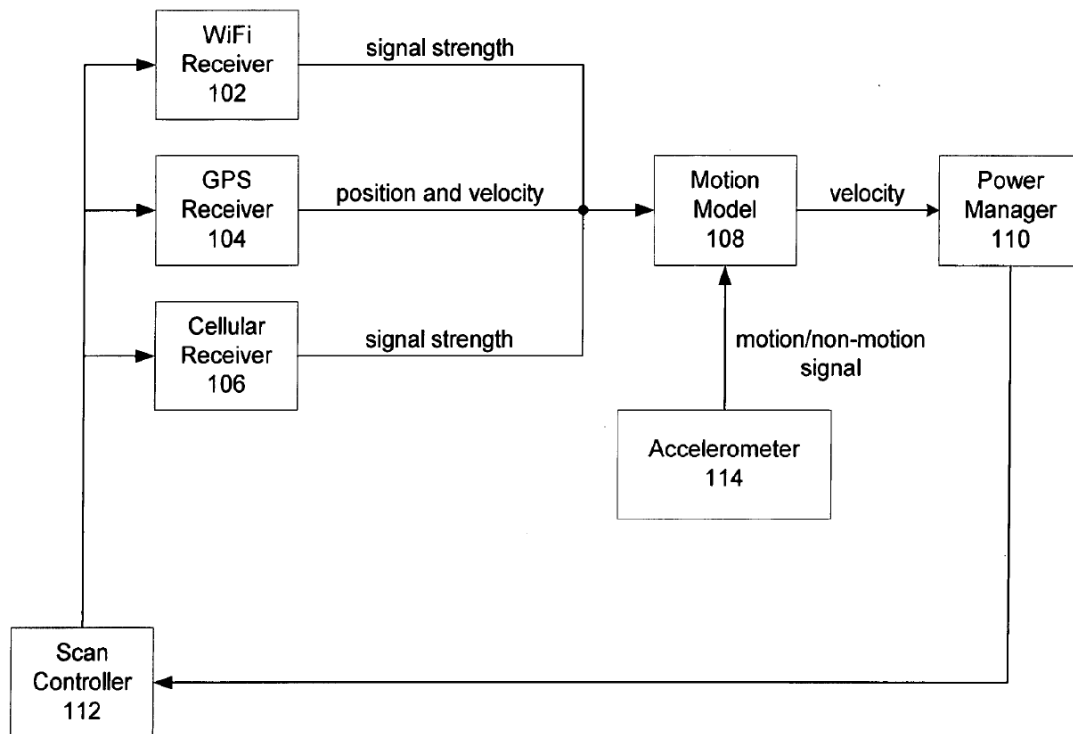
moved and thus likely [has been] misplaced.” Ex. 1004, 4:57–65, Fig. 3 (steps 32–36). In this situation, the phone determines and records its location and a time stamp. *Id.* at 5:1–3, Fig. 3 (steps 40, 42). If the device is not in a “safe zone” (such as the user’s home), the device sends an alert message to the user with the recorded location and time stamp when: (1) the battery level is below a threshold, or (2) an inactivity period has expired. *Id.* at 5:3–39, Fig. 3 (subroutine A, step 44), Fig. 5 (steps 202–208); *see id.* at 5:11–14 (explaining that the battery could drain while waiting for the rest period to expire).

If, on the other hand, the phone detects motion exceeding the threshold, then the accelerometer’s data is processed to determine if the data matches a drop profile or signature. Ex. 1004, 5:44–47, Fig. 3 (steps 32–34, 46); *see id.* at Fig. 2, 4:4–32 (explaining that accelerometer data indicates when a phone is dropped, stationary, or picked up). “If the acceleration profile is indicative of the phone being dropped” and the phone is not promptly picked up, “then the phone can immediately alert the user.” *Id.* at 5:50–58, Fig. 3 (steps 48–58); *see also id.* at 5:59–63 (phone can emit an alert ringtone and/or send an alert message to the user with its location).

2. *Miller (Ex. 1011)*

Miller discloses a method for reducing power consumption in a mobile device by halting the scanning of its receivers when the device is stationary. Ex. 1011 ¶ 12, Abst. A block diagram of Miller’s exemplary apparatus is shown in Figure 1, reproduced below:

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As shown above, apparatus 100 includes Wi-Fi receiver 102, GPS receiver 104, cellular receiver 106, and accelerometer 114. *Id.* ¶ 13. The receivers scan for radio signals to determine the mobile device’s location: GPS receiver 104 “receive[s] GPS satellite data to compute and track the mobile device’s current location”; Wi-Fi receiver 102 identifies nearby access points; and cellular receiver 106 identifies nearby cell towers. *Id.* ¶¶ 13–16. Accelerometer 114 measures the acceleration of the mobile device. *Id.* ¶¶ 17–18. This data is sent to a motion model, which “utilizes all signals from receivers 102, 104, 106, and accelerometer 114 to determine the velocity of the mobile device.” *Id.* ¶¶ 20–21; *see also id.* ¶ 26.

A scanning rate for receivers 102, 104, and/or 106 is determined based on the velocity of the mobile device. Ex. 1011 ¶ 22. In particular, if “the mobile device is not in motion, then the scanning rate may be set at

zero[,] . . . halt[ing] the scanning of receivers 102, 104, and/or 106,” so these components “utilize little or no power.” *Id.*; *see also id.* at Fig. 2 (steps 210, 214). *But see id.* ¶ 28 (describing another embodiment where the receivers “continue scanning, but at a much lower scanning rate”). Moreover, when the mobile device starts to move, “accelerometer 114 knows instantaneously” and provides an appropriate signal to motion model, which resumes the receivers’ scanning operations. *Id.* ¶¶ 18, 29; *see also id.* at Fig. 2 (steps 216, 204).

3. *Vaganov (Ex. 1008)*

Vaganov describes a three dimensional (3D) three-axis accelerometer for measuring three components of acceleration with respect to an orthogonal coordinate system. Ex. 1008 ¶¶ 3, 20, Abst. The accelerometer includes four beams, each of which is attached to a different side of a central proof mass and a surrounding frame. *Id.* ¶ 150; *see id.* at Fig. 6 (illustrating mechanical microstructure of the accelerometer). Vaganov contemplates use of the accelerometer in portable devices such as cell phones. *Id.* ¶ 40.

4. *Cervinka (Ex. 1009)*

Cervinka teaches a device for tracking cargo. Ex. 1009, Abst. Cervinka’s tracking device receives GPS position data from an access point; if that data is not received, the tracking device starts acquiring data from its internal dead reckoning sensors (including a 3D accelerometer). *Id.* at 4:41–55, 7:1–9; *see id.* at 3:53–61, Fig. 3. The tracking device sends “the last received GPS position data and the acquired dead reckoning data” to a central server so that the central server can determine the current location of the tracking device. *Id.* at 7:22–30, 7:50–55; *see id.* at 9:33–50 (suggesting

“pre-process[ing] the dead reckoning data directly in the controller 24 of the tracking device before sending it to the central server 10”).

According to Cervinka, a person of ordinary skill in the art would have understood that the current position of the tracking device (and its associated cargo) could be determined using the most recent GPS position data and the acquired dead reckoning data. Ex. 1009, 7:50–55; *see id.* at 3:62–64 (explaining that dead reckoning techniques are not described in detail because they “are believed well known in the art”), 7:56–62 (explaining that “many methods for the determination of the current position of the cargo exist and generally depend at least on the type of dead reckoning data received”).

5. *Herrero (Ex. 1010)*

Herrero discloses a method of locating a portable device using “Assisted GPS” (or “A-GPS”) technology. Ex. 1010 ¶ 12. According to Herrero, A-GPS technology improves the sensitivity, speed, and power consumption of a GPS receiver. *Id.* ¶¶ 5, 7; *see id.* ¶¶ 2–7 (explaining that conventional GPS systems generally have limited efficiency in interior spaces, where satellite signals may be not be received). Specifically, Herrero’s device calculates its location using both a GPS signal received from a satellite as well as “GPS assistance information” received via a “wireless communication network” from a server. *Id.* ¶ 13, Abst.; *see id.* ¶ 50 (stating the wireless communication network may be WiFi). The device includes a transmission/receiving module and an A-GPS positioning module that receives these signals. *Id.* ¶¶ 51–52, Figs. 1–2.

D. Obviousness Grounds Based on Miranda-Knapp and Miller

Petitioner contends that the subject matter of independent claims 1, 11, and 20 and dependent claims 5, 6, 8–10, 15, 16, 18, and 19 would have been obvious over the combination of Miranda-Knapp and Miller. Pet. 12–58. Petitioner further contends that the subject matter of dependent claims 2–4, 7, 12–14, and 17 would have been obvious over the combination of Miranda-Knapp and Miller with Vaganov, Cervinka, or Herrero. *Id.* at 58–74; *see also id.* at 8 (listing grounds).

Patent Owner contends that the proposed combination of Miranda-Knapp and Miller is improper. PO Resp. 4–10. Patent Owner does not otherwise dispute Petitioner’s contentions. *See* PO Resp.;⁸ PO Sur-reply.

1. Independent Claims 1, 11, and 20

Petitioner contends that the subject matter of independent claims 1, 11, and 20 would have been obvious over the combination of Miranda-Knapp and Miller. Pet. 13–50, 54–58. We begin our analysis with claim 1.

⁸ At institution, we cautioned Patent Owner that “any arguments not raised in the response may be deemed waived.” Paper 10 (Scheduling Order), 9; *see also In re NuVasive, Inc.*, 842 F.3d 1376, 1379–82 (Fed. Cir. 2016) (holding patent owner waived an argument addressed in the preliminary response by not raising it in the patent owner response). Thus, Patent Owner has waived all arguments for patentability not raised in Patent Owner Response. This includes all arguments raised in the Preliminary Response (Paper 8) but not presented in the Response (Paper 16).

- a. “*A portable electronic tracking device to monitor location coordinates of one or more individuals and objects, the device comprising*”

Petitioner asserts that, if the preamble is limiting,⁹ Miranda-Knapp teaches it. Pet. 13–16 (citing Ex. 1004, 1:12–15, 2:33–39,¹⁰ 2:52–3:27, 3:37–46, 3:55–57, 3:61–4:6, 4:33–56, 5:6–29, 5:54–60, 6:24–30, Fig. 3 (step 40), Fig. 4 (step 108); citing Ex. 1003 ¶¶ 112–120). According to Petitioner, Miranda-Knapp’s device 10 (the claimed “portable electronic tracking device”) determines whether a phone has been dropped or misplaced and determines the phone’s location by attempting a GPS fix so that the owner can be notified of the status of the phone. *Id.*

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

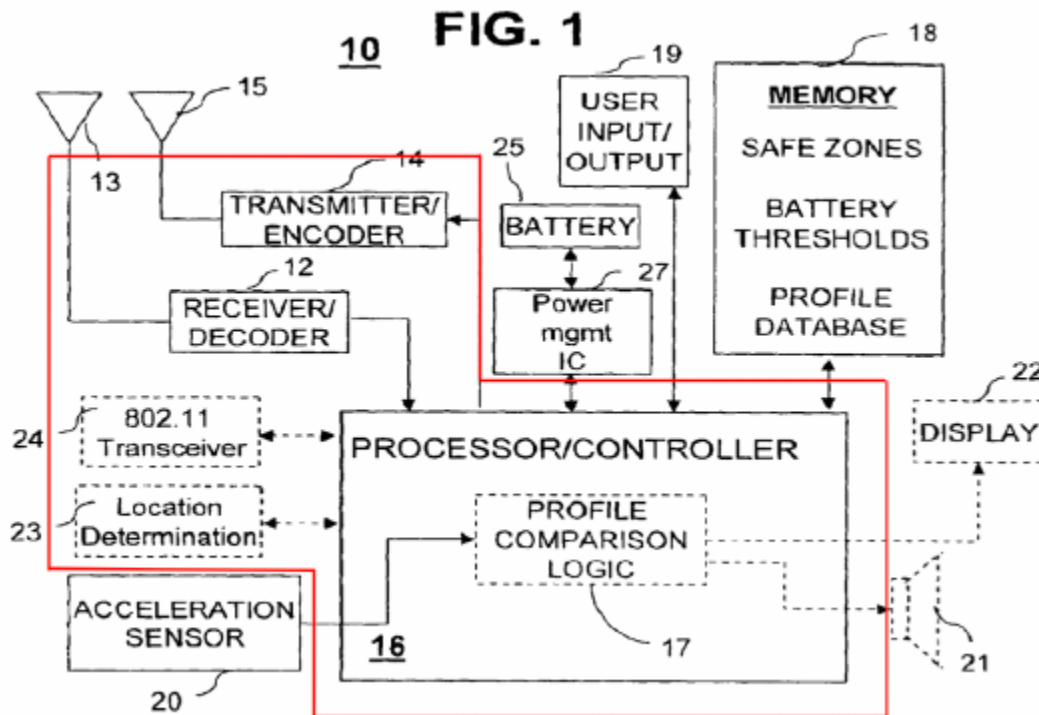
We are persuaded that Miranda-Knapp teaches the preamble. As noted above, Miranda-Knapp describes a method of detecting when a portable communication device (such as a cell phone) has been dropped or misplaced and then notifying the user of the device’s location. Ex. 1004, 1:12–32, 2:33–51, code (54), Abst. Miranda-Knapp teaches that device 10 can monitor location coordinates of a cell phone using GPS. *E.g., id.* at 3:21–27, 4:47–50, 5:19–28; Ex. 1003 ¶¶ 117–118, 120.

⁹ “Generally, the preamble does not limit the claims.” *Allen Eng’g Corp. v. Bartell Indus., Inc.*, 299 F.3d 1336, 1346 (Fed. Cir. 2002). However, we need not resolve whether the claim’s preamble is limiting because Petitioner shows that Miranda-Knapp teaches it. *See Nidec Motor*, 868 F.3d at 1017.

¹⁰ This citation includes a typographical error (*see* Pet. 14 (citing “2:33-3”)); we understand the citation to refer to lines 33 to 39.

- b. “transceiver circuitry to receive at least one portion of a receive communication signal comprising location coordinates information”

Petitioner contends that Miranda-Knapp teaches this limitation, or that it would have been obvious in light of Miranda-Knapp.¹¹ Pet. 16–18. Petitioner provides an annotated version of Miranda-Knapp’s Figure 1 (reproduced below) in support of its analysis.



In this annotated Figure 1, Petitioner outlines transmitter/encoder 14, receiver/decoder 12, transceiver 24, location module 23, and processor/controller 16 in red to identify “transceiver circuitry.” Pet. 16–17

¹¹ Petitioner also contends that it would have been obvious to combine Miller’s GPS receiver 104 with Miranda-Knapp to teach this claim limitation. Pet. 18–20. We do not address that alternative contention in this Decision because we need not (and do not) rely upon it. *Accord* Inst. Dec. 18–19 (similarly relying on Miranda-Knapp alone for this limitation “because we perceive no deficiencies in Miranda-Knapp itself”).

(citing Ex. 1004, 2:52–63, 3:21–4:3; Ex. 1003 ¶¶ 121–132; Ex. 1001, 8:2–4). Petitioner contends that Miranda-Knapp’s location module 23 determines its location using GPS technology. *Id.* (citing Ex. 1004, 3:21–27, 3:64–67, 4:41–50, 7:53–57 (claim 12), Fig. 3 (step 40), Fig. 4 (step 108)). Petitioner contends that an ordinary artisan would have understood that module 23 “determines its position with the location coordinates information from a GPS satellite signal including location coordinates information, as well-known in the art.” *Id.* at 17–18 (citing Ex. 1003 ¶¶ 124, 126; Ex. 1004, 1:62–66).

Patent Owner does not dispute these contentions. *See* PO Resp. In fact, Patent Owner agrees that Miranda-Knapp “explicitly discloses a location module which may be a GPS receiver” (*id.* at 7), and Patent Owner appears to also agree that Miranda-Knapp’s location module receives radio signals from GPS satellites to determine the device’s location (*see id.* at 6–7). *Accord* Inst. Dec. 17–18 (articulating the same understanding of identical statements in the Preliminary Response).

We are persuaded that Miranda-Knapp teaches this limitation. Miranda-Knapp’s device 10 includes transmitter/encoder 14, receiver/decoder 12, transceiver 24, location module 23, and processor/controller 16. Ex. 1004, Fig. 1, 2:52–63, 3:21–27. Miranda-Knapp teaches that location determination module 23 uses GPS technology to determine the phone’s location. *Id.* at 3:31–27, 4:47–50, Fig. 3 (step 40). A person of ordinary skill would have understood this to mean that location determination module 23 receives GPS coordinates from GPS satellite signals. Ex. 1003 ¶¶ 126–127; *see also id.* ¶¶ 122, 124.

- c. “accelerometer circuitry to measure displacements of the portable electronic tracking device, wherein the displacements comprise movements of an object or individual associated with the device”*

Petitioner asserts that Miranda-Knapp teaches this limitation. Pet. 20–23. According to Petitioner, Miranda-Knapp’s accelerometer (i.e., acceleration sensor 20) teaches the claimed “accelerometer circuitry.” *Id.* at 20–21 (citing Ex. 1004, 4:52–57, Abst., Fig. 1). Petitioner contends that a person of ordinary skill in the art would have understood Miranda-Knapp’s accelerometer “to measure displacements of the portable electronic tracking device” because an accelerometer measures the accelerations associated with the phone’s movement. *Id.* at 21–23 (citing Ex. 1003 ¶¶ 133–138; Ex. 1004, 4:4–33, 5:44–47, Fig. 2; comparing Ex. 1001, 8:47–51 with Ex. 1004, 2:52–57, 3:2–3). Petitioner explains that, “by measuring acceleration with an accelerometer, the displacement of the object, i.e., the movement of the object, is also measured.” *Id.* at 21–22. Petitioner also contends that Miranda-Knapp’s “device 10 may be included in a cell phone, [so] the accelerometer 20 is measuring the movements of the cell phone associated with the portable communication device (e.g., carrying the portable communication device).” *Id.* at 23 (citing Ex. 1003 ¶¶ 137–138).

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

We are persuaded that Miranda-Knapp teaches this limitation. Miranda-Knapp discloses an accelerometer 20, and we are persuaded that a person of ordinary skill in the art would have understood Miranda-Knapp to disclose that this accelerometer measures accelerations associated with movement and displacements of device 10 and its associated cell phone. *E.g.*, Ex. 1004, 2:52–57, 3:2–10, 4:4–32; Ex. 1003 ¶¶ 135–137.

- d. “a battery power monitor configured to activate and deactivate at least one portion of signaling circuitry in response to the accelerometer circuitry detecting a substantially stationary position of the electronic tracking device since last known location coordinate measurement”

(1) *Petitioner’s Contentions*

Petitioner contends that Miranda-Knapp in combination with Miller teaches this limitation. Pet. 23–43. Petitioner relies primarily on Miranda-Knapp (*see id.*), asserting that Miranda-Knapp teaches a battery power monitor and Miranda-Knapp’s device *activates* signaling circuitry, such as a cellular transceiver, to send an alert message with its location when left stationary outside of its safe zone (*id.* at 24–25), and that Miller teaches *deactivating* signaling circuitry, such as a GPS receiver, by halting its scanning operations (or, alternatively, *activating and deactivating* the GPS receiver at a lower scanning rate) when the device is stationary (*id.* at 25–26).

More specifically, Petitioner asserts that Miranda-Knapp teaches that power management IC 27 and processor 16 (the “battery power monitor”) activates transmitter/encoder 14 or transceiver 24 (“signaling circuitry”) in response to the accelerometer detecting a substantially stationary position. Pet. 26–33 (citing Ex. 1004, 2:65–3:2, 3:4–8, 3:21–36, 3:51–55, 4:57–65, 5:5–43, 6:57–61, Figs. 1, 3, 5; Ex. 1003 ¶¶ 141–153). Petitioner contends that “*Miranda-Knapp* teaches detecting a substantially stationary position, referred to as an ‘inactivity period’ where the device is ‘at rest’ or ‘sitting idle (no movement),’ and taking actions such as alerting the user responsive to the stationary position.” *Id.* at 29 (citing Ex. 1004, 3:32–36, 4:57–65, 5:13–17, 5:35–39, Fig. 5; Ex. 1003 ¶¶ 148–153). According to Petitioner, an

ordinary artisan would have understood that processor 16 instructs transceivers 14 and/or 24 to send the alert via voice, SMS, or email notification, which activates signaling circuitry. *Id.* at 27–28 (citing Ex. 1004, 3:21–36, 3:51–55, 5:39–43; Ex. 1003 ¶¶ 143–147), 33 (citing Ex. 1003 ¶ 151). Petitioner also contends that this activation is in response to a substantially stationary position “since last known location coordinate measurement,” as claimed, because Miranda-Knapp performs subroutine A, which monitors the inactivity period (Figure 5, step 208), after determining its position (Figure 3, step 40). *Id.* at 33–34 (citing Ex. 1004, 4:57–5:5, Figs. 3, 5; Ex. 1003 ¶ 152).

Petitioner further contends that Miller teaches deactivating signaling circuitry because it halts scanning operations for receivers, including GPS receiver 104, when the device is stationary in order to conserve battery power. Pet. 34–36 (citing Ex. 1011 ¶¶ 13, 15, 18, 20, 22, 28–30, Abst., Figs. 1–2; Ex. 1003 ¶¶ 154–156). Petitioner asserts that, in an alternative embodiment, Miller teaches both activating and deactivating its receivers according to a lower scanning rate (or duty cycle) when the device is stationary. *Id.* at 38–39 (citing Ex. 1011 ¶¶ 12, 18, 24, 28; Ex. 1003 ¶ 168).

Petitioner contends that, in light of Miller’s teachings, it would have been obvious to modify Miranda-Knapp’s device to deactivate location module 23 when the device is stationary, specifically after its location is determined (Figure 3, step 40) and during the processing of subroutine A (Figure 5), to conserve battery power. Pet. 36–37, 39–42 (citing Ex. 1004, 5:13–17, 5:29–39; Ex. 1011 ¶ 18; Ex. 1003 ¶¶ 69–79, 130–132, 160–168). Petitioner further contends that it would have been obvious to use Miller’s reduced duty cycle activation/deactivation of the GPS receiver in Miranda-

Knapp’s device to periodically obtain a GPS fix while still conserving power. *Id.* at 42–43 (citing Ex. 1011 ¶ 28; Ex. 1003 ¶ 168).

(2) Patent Owner’s Contentions

Patent Owner contends that Petitioner’s proposed combination of Miranda-Knapp and Miller is improper. PO Resp. 4–10. Patent Owner first argues that “[t]he proposed combination, as articulated by the Petitioner, would impermissibly add an element or functionality”—namely, a GPS receiver—“already present in the primary reference.” *Id.* at 7; *see id.* at 6–7 (providing additional explanation); *see also* PO Sur-reply 2–5. Patent Owner also argues that Miranda-Knapp and Miller “disclose contradictory teachings with regard to an essential limitation”—namely, what happens in response to a substantially stationary position—and thus “teach away from the proposed combination.” PO Resp. 7–9; *see also* PO Sur-Reply 8–9.

In its Sur-reply, Patent Owner presents new arguments.¹² In particular, Patent Owner argues that Miller “explicitly discredits and

¹² Each of these additional arguments are untimely: they were not presented in the Patent Owner Response, and they are not fairly responsive to Petitioner’s Reply. *See* PO Resp.; Pet. Reply. Specifically, we disagree with Patent Owner’s assertion that the Reply “clearly articulates Petitioner’s interpretation” “[f]or the first time” (PO Sur-reply 7), as the Institution Decision clearly articulated this same interpretation of the Petition’s contentions (*see* Inst. Dec. 23–25). As a result, these arguments are waived. *See* Paper 10 at 9 (“Patent Owner is cautioned that any arguments not raised in the response may be deemed waived.”); *see also* Consolidated Trial Practice Guide 73–74 (Nov. 2019), *available at* <https://www.uspto.gov/sites/default/files/documents/tpgnov.pdf> (“Generally, a reply or sur-reply may only respond to arguments raised in the preceding brief,” which “does not mean proceed in a new direction with a new approach as compared to the positions taken in a prior filing.”). However, we address these arguments in

criticizes the use of an accelerometer to detect a stationary position.” PO Sur-reply 5–6 (citing Ex. 1011 ¶ 21). Patent Owner also argues that Petitioner “misconstrues ‘signaling circuitry’” by pointing to some components in the claimed “transceiver circuitry” and contending that one circuit is activated while another is deactivated. *Id.* at 7–8. Further, Patent Owner argues that the references teach away from the claimed invention because Miranda-Knapp *activates* the GPS when the device is stationary, where Miller *deactivates* the GPS when the device is stationary. *Id.* at 8.

Patent Owner does not otherwise dispute Petitioner’s contentions regarding this limitation. *See* PO Resp.; PO Sur-reply.

(3) *Analysis*

Having considered the parties’ arguments and evidence, we are persuaded that this claim limitation is taught by the proposed combination of Miranda-Knapp and Miller, and a person of ordinary skill in the art would have been motivated and able to combine these references as proposed.

Miranda-Knapp teaches “a battery power monitor configured to activate . . . at least one portion of signaling circuitry in response to the accelerometer circuitry detecting a substantially stationary position of the electronic tracking device since last known location coordinate measurement,” as required by the claim. Miranda-Knapp describes operations that are performed in response to an accelerometer detecting a substantially stationary position for a period of time. Ex. 1004, Fig. 3 (steps 32–44, subroutine A), 4:57–5:43. In Miranda-Knapp, accelerometer

this Decision to explain why they would not have been persuasive even if they had been timely raised.

20 detects the substantially stationary position (*id.* at 4:57–60), and operations are performed “in response to” this detection, as shown by the flowcharts (*id.* at Figs. 3, 5). These operations include, for example, recording the “last known position” of device 10 (or determining position with a “GPS fix”) and monitoring the battery and an inactivity period. *Id.* at 4:67–5:43, Fig. 3 (steps 40–44, subroutine A), Fig. 5 (showing subroutine A). Specifically, when the battery is below a threshold or an inactivity period expires, an alert message is sent to the user via a phone number or email account. *Id.* at 5:5–43, Fig. 5 (steps 204–208). A person of ordinary skill in the art would have understood that this alert message is sent by activating transmitter/encoder 14 (and/or transceiver 24), and the described operations are controlled by Miranda-Knapp’s processor 16 (with power management IC 27). Ex. 1003 ¶¶ 142, 144, 151, 153; Ex. 1004, 2:65–3:2, 3:4–8, Fig. 1.

In addition, Miranda-Knapp suggests—and Miller teaches—the remainder of this claim limitation (i.e., “deactivating” signaling circuitry in response to the accelerometer detecting a substantially stationary position). Miranda-Knapp states that it is beneficial to “inhibit[]” “certain transmissions or phone calls” to conserve battery life when the device has been stationary. Ex. 1004, 5:11–18. This suggests the deactivation of signaling circuitry. Moreover, Miller expressly teaches that, when the device is stationary, the scanning operations of GPS receiver 104 (and/or other receivers) are halted in order to conserve battery power. *E.g.*, Ex. 1011 ¶¶ 18, 22, 28. Petitioner proposes modifying Miranda-Knapp based on Miller’s teaching so that Miranda-Knapp’s location module 23 is deactivated after a GPS fix (or other position data) is determined in step 40

of Figure 3. *See* Pet. 36–37. This proposed combination teaches this claim limitation.

Further, Miller teaches “activating and deactivating” signaling circuitry in response to a stationary position. Miller describes an alternative embodiment in which the scan controller instead “cause[s] the receivers to continue scanning, but at a much lower scanning rate, thereby consuming a great deal less power of the mobile device’s battery” when the device is stationary. Ex. 1011 ¶ 28. As Mr. Andrews testifies, a person of ordinary skill in the art would have understood the lower scanning rate to mean that a receiver is intermittently activated and deactivated. Ex. 1003 ¶ 159.

Petitioner proposes an alternative combination of Miranda-Knapp and Miller where Miranda-Knapp’s location module 23 is activated and deactivated at a lower scanning rate when the device is stationary, as taught by Miller. *See* Pet. 38–39. This alternative proposed combination also teaches this claim limitation.

We are also persuaded that a person of ordinary skill in the art would have been motivated to combine the references as proposed. *See* Pet. 39–43. Specifically, a person of ordinary skill in the art would have been motivated to increase a mobile device’s battery life, and the artisan would have recognized that deactivating the GPS receiver (or using a lower scanning rate for the GPS receiver) would accomplish this goal. Ex. 1003 ¶¶ 162–163; *see also* Ex. 1004, 5:11–18 (suggesting inhibiting “certain transmissions” to preserve battery power), 5:29–39 (monitoring battery level); Ex. 1011 ¶¶ 18, 22, 28 (turning off receivers to conserve battery). Consequently, a person of ordinary skill in the art would have found it desirable to deactivate the GPS receiver (or use a lower scanning rate for the

GPS receiver) when the device has been in a stationary position, for example, after the device's location has been determined and recorded. Ex. 1003 ¶ 160; *see also id.* ¶¶ 165–166 (explaining that the receiver would be reactivated when the device begins moving, as also taught by Miller), 168 (addressing additional benefits of lower scanning rate alternative). Finally, Mr. Andrews testifies that a person of ordinary skill in the art would have had a reasonable expectation of success. *Id.* ¶¶ 77–79, 164 (testifying that deactivating of a GPS when the device was stationary was “well-known” at the time and referring to supporting prior art), 167–168 (testifying that modifications to the references “would have been straightforward and well within the skillset of a[n ordinary artisan]”). We credit this testimony because it is logical and supported by persuasive rationale and evidence.

Patent Owner's arguments are unavailing. In particular, we disagree with Patent Owner's argument that the combination “impermissibly add[s] an element or functionality already present in the primary reference.” PO Resp. 7; *see also* PO Sur-reply 2–5. As explained above, Miranda-Knapp discloses location module 23 that may use GPS technology and suggests inhibiting “certain transmissions” when the device is stationary, and to this, Petitioner proposes adding the functionality of deactivating the GPS receiver (or activating and deactivating the GPS receiver at a lower duty cycle) from Miller's disclosure. Thus, contrary to Patent Owner's argument, the proposed combination does *not* add Miller's GPS receiver,¹³ and the added functionality is *not* “already present” in Miranda-Knapp. PO Resp. 7.

¹³ Patent Owner appears to misunderstand Petitioner's contention. *See* PO Sur-reply 3 (citing Pet. 28–29); *see also* Tr. 98:21–99:16. The Petition includes an alternative argument that the claimed “transceiver circuitry” is taught by Miller's GPS receiver (*see supra* note 11), and the Petition

We also disagree with Patent Owner’s argument that Miranda-Knapp and Miller teach away from the combination. PO Resp. 7–9. Patent Owner is correct that, when the device is stationary, Miranda-Knapp activates circuitry to transmit an alert message (*see id.* at 8), and Miller halts one or more of its receivers to conserve power (*see id.* at 9); however, from these facts, Patent Owner then concludes that the references describe “opposite solutions” and “teach away from the proposed combination” (*see id.*). These conclusions are not justified.

First, Patent Owner provides no analysis and cites no evidence to support either conclusion. We accord no weight to conclusory assertions by counsel. *See In re Geisler*, 116 F.3d 1465, 1470 (Fed. Cir. 1997).

Second, we do not agree that Miranda-Knapp and Miller describe opposite solutions. *See* PO Resp. 9; PO Sur-reply 8. Miranda-Knapp *transmits* an alert message, yet expressly states that “certain transmissions” could be inhibited to save battery power (Ex. 1004, 5:1–18), and Miller turns off one or more unused *receivers* (*e.g.*, Ex. 1011 ¶ 18). There is no conflict, for example, between turning off a device’s GPS receiver and activating its cellular transmitter. Likewise, both references recognize that some circuitry may be activated while other circuitry is deactivated (with a goal of saving power), and both references indicate flexibility in the circuits involved and timing of deactivation. *See, e.g.*, Ex. 1004, 5:1–18 (stating that “certain transmissions or phone calls” could be inhibited to save power), 5:54–65 (describing different ways of alerting the user); Ex. 1011 ¶¶ 18 (noting that

explains why that mapping would also satisfy this limitation (*see* Pet. 28–29). But, because we do not rely on (or address) that alternative contention, those portions of the Petition are not germane to this analysis.

“one or more receivers” can be halted), 28 (noting that lower scanning rate can instead be used). Consequently, we find that these references describe compatible and complimentary solutions. But, in any event, there is no conflict between Miranda-Knapp’s teaching of acquiring a final “GPS fix” (in step 40) and Miller’s use of a lower duty cycle when the device is stationary. *See* Ex. 1011 ¶ 28 (“In one embodiment of the invention, the scan controller may cause the receivers to continue scanning, but at a much lower scanning rate, thereby consuming a great deal less power of the mobile device’s battery.”). Thus, at a minimum, Miller’s lower duty cycle is compatible with Miranda-Knapp, and Patent Owner’s argument does not apply to this alternative combination (which also teaches the claim limitation, as addressed above).

Third, even if the references did describe opposite solutions, this alone would not constitute a teaching away. *See In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004) (“[M]ere disclosure of alternative designs does not teach away.”). Patent Owner identifies (and we perceive) nothing in either reference that criticizes, discredits, or otherwise discourages the claimed solution. *See* PO Resp. 9; *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994) (“A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant.”). In addition, Patent Owner identifies (and we perceive) no evidence to suggest that an ordinary artisan would be discouraged from making the combinations proposed by Petitioner.

We also disagree with Patent Owner’s belated argument that Miller teaches away from the combination because, according to Patent Owner,

Miller “explicitly discredits and criticizes the use of an accelerometer to detect a stationary position.” PO Sur-reply 5–6 (citing Ex. 1011 ¶ 21). This argument is flatly contradicted by Miller’s express disclosure. Miller states that “[a]ccelerometer 114 sends signals to motion model 108 indicating whether or not the mobile device is in motion.” Ex. 1011 ¶ 18. Motion model 108 can also use signals from receivers 102, 104, 106 “because in some instances there may be an apparent motion of zero indicated by the accelerometer when there is no acceleration, yet the mobile device may be . . . moving at a constant speed.” *Id.* ¶ 21. But the fact that additional data is also used does not undercut Miller’s disclosure that *an accelerometer is used* to detect a stationary position. Notably, we discern no claim limitation that prohibits the use of other components, and Petitioner’s proposed combination does not rely on Miller’s position determination technique.

Finally, Patent Owner’s belated arguments regarding “signaling circuitry” are also unavailing. PO Sur-reply 7–8. Patent Owner appears to erroneously assume that the “transceiver circuitry” cannot share components with the “signaling circuitry” (*see id.* at 9); however, we discern no basis for such a conclusion. Also, Patent Owner assumes that this claim language requires the same component to be both activated and deactivated; however, Patent Owner does not support its assumption with any evidence or analysis. *See id.* at 7. The intrinsic record does not appear to support Patent Owner’s assumption. *See, e.g.,* Ex. 1001, 8:13–39 (stating that, when the device is stationary, the last known position is communicated without activating GPS

circuitry).¹⁴ But even if Patent Owner were correct, Petitioner’s alternative contention (*see* Pet. 38–39 (relying on Miller’s use of a lower duty cycle)) would still teach this limitation because Miller’s GPS receiver is the component that is both activated and deactivated. *See* Ex. 1011 ¶ 28.

Accordingly, we are persuaded that this limitation is taught by the combination of Miranda-Knapp and Miller, and that it would have been obvious to combine these references as proposed.

- e. *“processor circuitry configured to process the displacements, to associate the displacements with a specified pattern, and to generate an alert message in response to the specified pattern”*

Petitioner asserts that Miranda-Knapp teaches this limitation. Pet. 43–50. According to Petitioner, processor 16 and profile comparison logic 17 teach “processor circuitry” configured to perform the three recited operations. *Id.* at 43–44 (Ex. 1004, 3:4–10, 4:4–43, 5:44–60, Fig. 1). Petitioner contends that, in Miranda-Knapp, these components determine whether the phone was dropped by processing data from the accelerometer and evaluating whether it matches a drop signature (or profile). *Id.* at 44–49 (citing Ex. 1004, 3:4–16, 4:4–16, 4:25–28, 4:33–42, 5:44–55, 8:15–23 (claim 18), Fig. 2, Fig. 3 (step 46); Ex. 1003 ¶¶ 172–176). According to Petitioner, Miranda-Knapp generates an alert if the phone was dropped and

¹⁴ Of note, Patent Owner points to this portion of the disclosure when identifying written description support for this claim limitation. *See* RMTA 6–7 (citing Ex. 2015, 12:6–8, 12:12–17; Ex. 2018 ¶ 36).

not promptly picked up. *Id.* at 49–50 (citing Ex. 1004, 4:51–60, 5:45–60, Fig. 3 (steps 46, 54–60));¹⁵ Ex. 1003 ¶¶ 177–179).

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

We are persuaded that Miranda-Knapp teaches this limitation. Miranda-Knapp’s device 10 includes processor 16 and profile comparison logic 17 that “process the sensor signal from the motion sensing device 20 [i.e., accelerometer 20] to determine if it matche[s] a signature stored in memory 18 indicating that the phone had been dropped.” Ex. 1004, 3:4–10, Fig. 1; *see id.* at 3:15–16 (noting that logic module 16 can be embedded in processor 16), 4:39–43 (identifying alternative signatures/profiles), Fig. 2 (showing exemplary acceleration profile). “[U]pon determining the acceleration profile matches the predetermined profile,” an alert may be generated to notify the user. *Id.* at 4:51–56. For example, Miranda-Knapp’s device 10 alerts the user if it determines that the phone was dropped and not promptly picked-up. *Id.* at 5:44–60, Fig. 3 (steps 46–60).

f. Claims 11 and 20 recite commensurate limitations

For claims 11 and 20, Petitioner largely refers back to its analysis of the corresponding limitations in claim 1. Pet. 54–55, 57–58 (citing *id.* at 13–50; Ex. 1003 ¶¶ 193–197, 211–215). In addition, Petitioner further explains that Miranda-Knapp teaches processing the claimed “at least one portion of the receive communication signal,” as recited by claim 11, because device 10 (specifically, processor 16 and location determination module 23)

¹⁵ We correct the Petition’s typographical error, which referred to Figure 2 rather than Figure 3. *Accord* Inst. Dec. 26 n.11 (making same correction).

determines its location from the received signal. *Id.* at 55–56 (citing Ex. 1003 ¶¶ 198–200; Ex. 1004, 1:12–15, 3:21–27, 5:1–5, Fig. 3 (step 42)).

Patent Owner does not dispute these contentions, other than as discussed above with respect to claim 1. *See* PO Resp.

We are persuaded that each limitation of claims 11 and 20 is taught by Miranda-Knapp or the combination of Miranda-Knapp and Miller, for the reasons explained above with the corresponding limitations of claim 1. Also, we are persuaded that it would have been obvious to combine these references in the manner proposed by Petitioner (and Patent Owner’s arguments to the contrary are unavailing), for the reasons previously explained. *See supra* § II.D.1.d.

g. Conclusion

For the reasons provided above, we are persuaded that each limitation of independent claims 1, 11, and 20 is taught by Miranda-Knapp or the combination of Miranda-Knapp and Miller. In addition, we are persuaded that a person of ordinary skill in the art would have been motivated to combine Miranda-Knapp and Miller as proposed, and that the ordinary artisan would have had a reasonable expectation of success in doing so.

Accordingly, we conclude that Petitioner has shown, by a preponderance of the evidence, that the subject matter of claims 1, 11, and 20 would have been obvious over the combination of Miranda-Knapp and Miller.

2. Dependent Claim 2

Claim 2 depends from claim 1 and recites: “the accelerometer comprises a multi-beam structure having at least one beam, of the multi-

beam structure comprising a directional orientation substantially orthogonal to at least one other beam of the multi-beam structure.” Ex. 1001, 10:41–45.

Petitioner contends that claim 2 would have been obvious over the combination of Miranda-Knapp, Miller, and Vaganov. Pet. 58–61. In particular, Petitioner contends that Vaganov describes a three-axis accelerometer, and an ordinary artisan would have recognized that Vaganov’s accelerometer includes multiple beams that are each substantially orthogonal to at least one of the other beams. *Id.* at 58–60 (citing Ex. 1003 ¶¶ 216–220; Ex. 1008 ¶¶ 20, 26, 40, 150, Abst., Fig. 6). Petitioner argues that a person of ordinary skill in the art would have found it obvious to combine Vaganov with Miranda-Knapp as modified by Miller to yield the limitations of claim 2. *Id.* at 60–61 (citing Ex. 1003 ¶¶ 219–220; Ex. 1004, 4:18–25; Ex. 1008 ¶ 40).

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

We are persuaded that Vaganov teaches the additionally-recited limitations of claim 2. Specifically, Vaganov describes a 3D, three-axis accelerometer that includes four beams, with two beams disposed orthogonally to the other two. Ex. 1008 ¶¶ 3, 20, 150, Fig. 6 (illustrating beams 90 and 94 disposed orthogonally to beams 92 and 96); *see also* Ex. 1003 ¶ 218. Moreover, we are persuaded that it would have been obvious to add Vaganov’s accelerometer to Miranda-Knapp’s device 10. *See* Ex. 1003 ¶¶ 219–220 (testifying that an ordinary artisan would have been motivated to, and able to, combine these references). Indeed, Miranda-Knapp indicates that its accelerometer may be a “3 axis accelerometer” (Ex. 1004, 4:18–25), and Vaganov specifically states that its three-axis accelerometer can be used in cell phones (Ex. 1008 ¶ 40). Finally, as

explained above, we are persuaded that it would have been obvious to combine Miranda-Knapp and Miller, and we are persuaded that the limitations of independent claim 1 are taught by the combination of Miranda-Knapp and Miller.

Accordingly, we conclude that Petitioner has shown, by a preponderance of the evidence, that the subject matter of claim 2 would have been obvious over the combination of Miranda-Knapp, Miller, and Vaganov.

3. Dependent Claims 3 and 12

Claim 3 depends from claim 1 and recites: “the processor circuitry is further configured to compute the location coordinates of the device from the at least one portion of the receive communication signal and the displacements of the electronic tracking device.” Ex. 1001, 10:46–50. Claim 12 depends from claim 11 and recites commensurate limitations. *Id.* at 11:32–36.

Petitioner contends that claims 3 and 12 would have been obvious over the combination of Miranda-Knapp, Miller, and Cervinka. Pet. 61–65, 67. In particular, Petitioner argues that Cervinka teaches determining a device’s current location using a last known position and displacements from that position, which “is the very old and well-known technique of dead reckoning.” *Id.* at 61–62 (citing Ex. 1003 ¶¶ 40–56, 221–231; Ex. 1009, 3:32–39, 3:53–59, 3:62–64, 6:44–47, 7:1–9, 7:26–30, 7:48–62, Fig. 3, Abst.). Petitioner further contends that it would have been obvious to modify Miranda-Knapp’s method of determining the phone’s position, which uses a signal from location module 23 (e.g., a GPS signal), to incorporate subsequent displacements using dead reckoning techniques, as disclosed by Cervinka. *Id.* at 62–65 (citing Ex. 1003 ¶¶ 226, 229–231;

Ex. 1004, 5:55–60, Fig. 3 (step 40), Fig. 4 (step 108); Ex. 1011 ¶ 26;
Ex. 1009, 3:53–62, Fig. 3).

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

We are persuaded that Cervinka teaches the additionally-recited limitations of these claims. Cervinka’s device has a “dead reckoning module” with sensors including, for example, “a 3D accelerometer.” Ex. 1009, 3:55–61. Cervinka teaches that a device’s location can be determined from its “last known position . . . , as determined by the GPS position data, and the dead reckoning data.” *Id.* at 7:50–55. A person of ordinary skill in the art would have understood this to disclose determining a device’s current position from the last known GPS coordinates and the device’s subsequent displacements. *See* Ex. 1003 ¶¶ 223, 226; *see also* Ex. 1009, 3:62–64 (stating that dead reckoning techniques are not discussed in detail because they are “well known in the art”), 7:56–59 (stating that methods of calculating position from dead reckoning data are known in the art).

In addition, we are persuaded that a person of ordinary skill in the art would have been motivated to add well-known dead reckoning functionality (described in Cervinka) to the combination of Miranda-Knapp and Miller so that the device’s position can be calculated when GPS signals are not available. *See* Ex. 1003 ¶¶ 223, 226, 228–230. We are also persuaded that an ordinary artisan would have had a reasonable expectation of success. *See id.* ¶¶ 228, 231; Ex. 1009, 3:62–64, 7:56–59. Furthermore, as explained above, we are persuaded that it would have been obvious to combine Miranda-Knapp and Miller, and we are persuaded that the limitations of the

respective independent claims are taught by the combination of Miranda-Knapp and Miller.

Accordingly, we conclude that Petitioner has shown, by a preponderance of the evidence, that the subject matter of claims 3 and 12 would have been obvious over the combination of Miranda-Knapp, Miller, and Cervinka.

4. Dependent Claims 4 and 13

Claim 4 depends from claim 1 and recites: “the displacements are transmitted to a monitoring station to determine current location coordinates information of the portable electronic tracking device based in part on the displacements and at least one of last known location coordinates of the electronic tracking device, last known location coordinates of another electronic tracking device, and landmark location coordinates.” Ex. 1001, 10:51–57. Claim 13 depends from claim 11 and recites commensurate limitations. *Id.* at 11:37–12:2.

Petitioner contends that claims 4 and 13 would have been obvious over the combination of Miranda-Knapp, Miller, and Cervinka. Pet. 65–68. Petitioner contends that Cervinka’s tracking device sends the last received GPS position data and the acquired dead reckoning data to a central server so that the server can determine the device’s current location. *Id.* at 65–66 (citing Ex. 1003 ¶¶ 232–238; Ex. 1009, 3:53–61, 7:1–9, 7:26–30, 7:50–55, 9:33–50). Petitioner further contends that a person of ordinary skill in the art would have found it obvious to combine these teachings of Cervinka with the combination of Miranda-Knapp and Miller. *Id.* at 66–67 (citing Ex. 1003 ¶¶ 58–60, 235–238; Ex. 1004, 3:51–55, 5:29–33, 6:14–33, Fig. 5; Ex. 1009, 9:33–50).

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

We are persuaded that Cervinka teaches that “the displacements are transmitted to a monitoring station to determine current location coordinates information of the portable electronic tracking device based in part on the displacements and . . . [the] last known location coordinates of the electronic tracking device,” as recited by these claims. In particular, Cervinka teaches that, “with the last known position of the cargo, as determined by the GPS position data, and the dead reckoning data received from the tracking device 14, the central server 10 may determine the current position of the cargo.” Ex. 1009, 7:50–55; *see also, e.g., id.* at 7:26–30. We are also persuaded that a person of ordinary skill in the art would have been motivated to add this functionality to the combination of Miranda-Knapp and Miller and would have had a reasonable expectation of success. *See* Ex. 1003 ¶¶ 235–238; Ex. 1009, 9:33–50 (recommending that dead reckoning data be sent to the server “to improve accuracy and/or certainty”); *see also supra* § II.D.3 (addressing rationale to add Cervinka’s dead reckoning functionality to the combination). Furthermore, as explained above, we are persuaded that it would have been obvious to combine Miranda-Knapp and Miller, and we are persuaded that the limitations of the respective independent claims are taught by the combination of Miranda-Knapp and Miller.

Accordingly, we conclude that Petitioner has shown, by a preponderance of the evidence, that the subject matter of claims 4 and 13 would have been obvious over the combination of Miranda-Knapp, Miller, and Cervinka.

5. Dependent Claims 5 and 15

Claim 5 depends from claim 1 and recites: “the battery power monitor is configured to deactivate at least one portion of the signaling circuitry when the accelerometer circuitry detects a substantially stationary position of the electronic tracking device.” Ex. 1001, 10:58–62. Claim 15 depends from claim 11 and recites commensurate limitations. *Id.* at 12:6–9.

Petitioner contends that the subject matter of claims 5 and 15 would have been obvious over the combination of Miranda-Knapp and Miller. Pet. 50, 57. In particular, Petitioner contends that the proposed combination of Miranda-Knapp and Miller teaches deactivating Miranda-Knapp’s location module 23 when accelerometer 20 detects a stationary position. *Id.* (citing Pet. 23–43; Ex. 1003 ¶¶ 180–181, 203–204).

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

We are persuaded that the combination of Miranda-Knapp and Miller teaches the additionally-recited limitations of these claims. *See supra* § II.D.1.d (finding that the combination teaches these claimed aspects). Moreover, as explained above, we are persuaded that it would have been obvious to combine these references as proposed by Petitioner, and that the limitations of the respective independent claims are taught by the proposed combination.

Accordingly, we conclude that Petitioner has shown, by a preponderance of the evidence, that the subject matter of claims 5 and 15 would have been obvious over the combination of Miranda-Knapp and Miller.

6. Dependent Claims 6 and 16

Claim 6 depends from claim 1 and recites: “the battery power monitor is configured to activate at least one portion of the signaling circuitry when the accelerometer circuitry detects that the electronic tracking device is not in a substantially stationary position.” Ex. 1001, 10:63–67. Claim 16 depends from claim 11 and recites commensurate limitations. *Id.* at 12:10–13.

Petitioner contends that the subject matter of claims 6 and 16 would have been obvious over the combination of Miranda-Knapp and Miller. Pet. 51–52, 57. In particular, Petitioner contends that Miller teaches reactivating its receivers when the accelerometer detects that the device is no longer stationary, and a person of ordinary skill in the art would have found it obvious to also include this feature in the proposed combination. *Id.* (citing Ex. 1003 ¶¶ 182–184, 205–206; Ex. 1011 ¶¶ 18, 29).

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

We are persuaded that Miller teaches the additionally-recited limitations of these claims. In particular, Miller teaches that, when “it is determined that the mobile device has resumed movement, the process . . . enable[s] the receivers to resume or start scanning again.” Ex. 1011 ¶ 29; *see also id.* ¶ 18 (explain that accelerometer detects the movement). We are also persuaded that it would have been obvious to include this feature in the proposed combination. *See* Ex. 1003 ¶ 184; *see also supra* § II.D.1.d (addressing motivation to combine the references). In addition, as explained above, we are persuaded that it would have been obvious to combine Miranda-Knapp and Miller as proposed by Petitioner, and that the

limitations of the respective independent claims are taught by the proposed combination.

Accordingly, we conclude that Petitioner has shown, by a preponderance of the evidence, that the subject matter of claims 6 and 16 would have been obvious over the combination of Miranda-Knapp and Miller.

7. Dependent Claims 7 and 17

Claim 7 depends from claim 1 and recites: “the transceiver is configured to receive the at least one portion of the receive communication signal from a GPS satellite and from a wireless communication network.” Ex. 1001, 11:1–4. Claim 17 depends from claim 11 and recites commensurate limitations. *Id.* at 12:15–17.

Petitioner contends that claims 7 and 17 would have been obvious over the combination of Miranda-Knapp, Miller, and Herrero. Pet. 69–74. In particular, Petitioner asserts that Herrero’s A-GPS device calculates its location using signals received from both a GPS network and a wireless communication network. *Id.* at 69–70 (citing Ex. 1010 ¶¶ 1, 12–13, 34, 51, 74–75, 93, Abst.). Petitioner argues that a person of ordinary skill in the art would have found it obvious to combine Herrero with Miranda-Knapp as modified by Miller to yield the limitations of these claims. *Id.* at 70–74 (citing Ex. 1003 ¶¶ 254–259; Ex. 1004, 2:57–63, 3:21–27, 3:61–67; Ex. 1011 ¶¶ 13, 25; Ex. 1010 ¶¶ 5, 7, 93).

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

We are persuaded that Herrero teaches the additionally-recited limitations of these claims. Herrero’s A-GPS device receives GPS assistance information (from a wireless communication network) and GPS

signals (from a GPS network) to calculate the device's location. *E.g.*, Ex. 1010 ¶¶ 13, 34, 51. In addition, we are persuaded that a person of ordinary skill in the art would have been motivated to add Herrero's A-GPS technology to the combination of Miranda-Knapp and Miller to improve GPS position determination. *See* Ex. 1003 ¶¶ 254–256; Ex. 1010 ¶¶ 5–7, 93 (explaining that A-GPS technology improves the speed and sensitivity of a GPS receiver). We are also persuaded that an ordinary artisan would have had a reasonable expectation of success in making the combination. *See* Ex. 1003 ¶¶ 257–259; *see also* Ex. 1010 ¶¶ 12–14, 34–35 (similarly deactivating GPS components when the device is stationary to conserve battery). Furthermore, as explained above, we are persuaded that it would have been obvious to combine Miranda-Knapp and Miller, and we are persuaded that the limitations of the respective independent claims are taught by the combination of Miranda-Knapp and Miller.

Accordingly, we conclude that Petitioner has shown, by a preponderance of the evidence, that the subject matter of claims 7 and 17 would have been obvious over the combination of Miranda-Knapp, Miller, and Herrero.

8. Dependent Claims 8–10, 18, and 19

Claim 8 depends from claim 1 and recites: “the accelerometer is configured to measure a physical impact to the device.” Ex. 1001, 11:5–6. Claim 9 depends from claim 8 and recites: “user is alerted of the physical impact based in part on a magnitude value of the physical impact.” *Id.* at 11:7–9. Claim 10 depends from claim 9 and recites “the accelerometer is further configured to measure a pattern or characteristic of physical impacts to the device.” *Id.* at 11:10–12. Claims 18 and 19 depend from claim 11

and recite limitations commensurate with those recited in claims 8 and 9. *Id.* at 12:18–22.

Petitioner contends that the subject matter of these claims would have been obvious over the combination of Miranda-Knapp and Miller. Pet. 52–54, 57. In support, Petitioner contends that Miranda-Knapp teaches the additionally-recited limitations of these claims. *Id.* Specifically, according to Petitioner, in Miranda-Knapp: if the output of an accelerometer exceeds a threshold (a “magnitude value”), then the accelerometer’s measurements are compared to a profile to determine whether a phone has been dropped (a “physical impact”); and if the phone has been dropped and is not promptly picked up, then an alert is provided to the user. *Id.* (citing Ex. 1004, 3:2–3, 3:8–10, 4:4–32, 4:57–5:17, 5:44–63, Figs. 2, 3; Ex. 1003 ¶¶ 185–192, 207–210).

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

We are persuaded that Miranda-Knapp teaches the additionally-recited limitations of these claims. Miranda-Knapp’s accelerometer 20 measures physical impacts to the mobile phone (such as being dropped). *E.g.*, Ex. 1004, 3:2–3, 4:4–32, Fig. 2 (showing example acceleration profile); *see also* Ex. 1003 ¶ 186. If the magnitude of the impact exceeds “a predetermined threshold,” Miranda-Knapp’s device determines whether the acceleration “data matches a drop profile or signature” and then may, as a result, provide an alert to the user. Ex. 1004, 5:44–47, 5:55–64; *see also* Ex. 1003 ¶¶ 188–189. Specifically, this alert is provided if the acceleration profile indicates that the device was dropped but not promptly picked up. Ex. 1004, 4:4–32, 5:50–64; *see also* Ex. 1003 ¶ 192. Moreover, as explained above, we are persuaded that it would have been obvious to

combine Miranda-Knapp and Miller as proposed by Petitioner, and that the limitations of the respective independent claims are taught by the proposed combination.

Accordingly, we conclude that Petitioner has shown, by a preponderance of the evidence, that the subject matter of claims 8–10, 18, and 19 would have been obvious over the combination of Miranda-Knapp and Miller.

9. Dependent Claim 14

Claim 14 depends from claim 11 and recites: “calculating location data based on at least one of the at least one portion of the receive communication signal and the displacements.” Ex. 1001, 12:3–5.

Petitioner contends that claim 14 would have been obvious over the combination of Miranda-Knapp, Miller, and Cervinka.¹⁶ Pet. 68 (citing Ex. 1003 ¶¶ 245–248). Petitioner contends that Miranda-Knapp calculates the phone’s location (e.g., obtains a GPS fix) based on the signal received from location module 23, which teaches “calculating location data based on . . . the receive communication signal.” *Id.* (citing Ex. 1003 ¶ 247; Ex. 1004, 3:21–27, Fig. 3 (step 40)). Petitioner also contends that Cervinka calculates location data using dead reckoning techniques, as discussed above with respect to claims 3, 4, 12, and 13. *Id.*

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

¹⁶ As we previously noted, we determine that Petitioner’s only ground asserted against claim 14 is based on the combination of Miranda-Knapp, Miller, and Cervinka. *See* Inst. Dec. 30 n.12 (citing Pet. 8, 68).

As explained above, we are persuaded that Cervinka teaches calculating location data using the last known GPS location and the subsequent displacements of the device, which satisfies the additionally-recited limitations of this claim, and that it would have been obvious to combine Miranda-Knapp, Miller, and Cervinka as proposed. *See supra* § II.D.3 (addressing claims 3 and 12). Moreover, we are persuaded that Miranda-Knapp teaches the additionally-recited limitations of this claim because it calculates the phone's location based on the GPS signal received by location module 23. *E.g.*, Ex. 1004, 3:21–27, 4:47–50, Fig. 3 (step 40).

Accordingly, we conclude that Petitioner has shown, by a preponderance of the evidence, that the subject matter of claim 14 would have been obvious over the combination of Miranda-Knapp, Miller, and Cervinka.

III. MOTION TO AMEND

Pursuant to 35 U.S.C. § 316(d)(1) and 37 C.F.R. § 42.121(a), Patent Owner filed a contingent Motion to Amend seeking to replace claims 1–20 of the '619 patent with proposed substitute claims 21–40, respectively, if any of the original claims are found unpatentable. *See* MTA. After receiving Preliminary Guidance from the Board (*see* PG), Patent Owner filed a Revised Motion to Amend proposing revised substitute claims 21–40 if the corresponding original claims are found unpatentable. *See* RMTA.

Because we have determined that all challenged claims are unpatentable (*see supra* §§ II.D.1–II.D.9), we proceed to address all proposed substitute claims in Patent Owner's Revised Motion to Amend.

A. Proposed Substitute Claims

In the Revised Motion to Amend, Patent Owner proposes: substitute claim 21 to replace claim 1, claim 31 to replace claim 11, and claim 40 to replace claim 20. RMTA 26–32. These claims are reproduced below, with underlining to indicate added text and strikethrough to indicate deleted text. For clarity, we have added emphasis to each amendment, and for ease of reference, we add Petitioner’s reference identifiers (*see* RMTA Opp. 16–19).

21. [pre] A portable electronic tracking device to monitor location coordinates of one or more individuals and objects, the device comprising:

[a] transceiver circuitry to receive at least one portion of a receive communication signal comprising location coordinates information;

[b] accelerometer circuitry to measure displacements of the portable electronic tracking device, wherein the displacements comprise movements of an ~~object or~~ individual associated with the device;

[c] a battery power monitor configured to activate and deactivate at least one portion of signaling circuitry in response to the accelerometer circuitry detecting a substantially stationary position of the electronic tracking device since last known location coordinate measurement; and

[d] processor circuitry configured to process the displacements, to associate the displacements with a specified pattern, and to generate an alert message in response to the specified pattern.

31. [pre] A method to monitor location coordinates of one or more individuals or objects, the method comprising:

[a] receiving at transceiver circuitry of a portable electronic tracking device at least one portion of a receive

communication signal comprising location coordinates information;

[b] measuring displacements of the portable electronic tracking device, wherein the displacements comprise movements of an ~~object or~~ individual associated with the device;

[c] associating the displacements with a specified pattern and generating an alert message in response to the specified pattern;

[d] activating and deactivating at least one portion of signaling circuitry in response to detecting, by the accelerometer circuitry, a substantially stationary position of the electronic tracking device since last known location coordinate measurement; and

[e] processing the at least one portion of the receive communication signal using processor circuitry.

40. [pre] A portable electronic tracking device to monitor location coordinates of one or more individuals and objects, the device comprising:

[a] transceiver circuitry to receive at least one portion of a receive communication signal comprising location coordinates information;

[b] accelerometer circuitry to measure displacements of the portable electronic tracking device and to measure a pattern or characteristic of physical impacts by an individual to the device;

[c] a battery power monitor configured to activate and deactivate at least one portion of signaling circuitry in response to the accelerometer circuitry detecting a substantially stationary position of the electronic tracking device since last known location coordinate measurement; and

[d] processor circuitry configured to process the displacements.

RMTA 26, 28–29, 31–32 (emphases and reference identifiers added). In addition, Patent Owner proposes substitute claims 22–30 and 32–39 to replace dependent claims 2–10 and 12–19. *Id.* at 27–31. Each of these proposed substitute claims are identical to the dependent claims they would replace, except for a revision to depend from the corresponding substitute independent claim. *Id.*

B. Procedural History of Motion to Amend

We provide a summary of the motion to amend briefing because this background is relevant to some of Petitioner’s arguments. *See infra* § III.C (analyzing whether the contents of Patent Owner’s revised motion to amend are proper).

Patent Owner filed a first contingent Motion to Amend proposing substitute claims 21–40 to replace claims 1–20, respectively. *See* MTA. In particular, this motion proposed: replacing the reference to displacements of “an object or individual” with “an individual” in independent claims 1 and 11, adding the phrase “by an individual” to independent claim 20, and revising the dependent claims so that they depend from the substitute independent claims. *Id.* at 26–31.

Petitioner opposed the motion. MTA Opp. Petitioner argued that the proposed claims lacked written description support for three phrases: “transceiver circuitry” (*id.* at 3–4), “activat[ing] and deactivat[ing] at least one portion of signaling circuitry in response to . . . detecting a substantially stationary position of the electronic tracking device since last known location coordinate measurement” (*id.* at 4–7), and “battery power monitor” (*id.* at 7–8). In addition, Petitioner argued that the subject matter of the proposed substitute claims would have been obvious over the combination

of the Petition’s asserted references and a new reference (Zhou), which teaches the newly added limitation. *Id.* at 8–25.

We issued Preliminary Guidance on Patent Owner’s original Motion to Amend (*see* PG), at Patent Owner’s request (*see* MTA 2), as contemplated by the MTA Pilot Program. *See also* Notice Regarding a New Pilot Program Concerning Motion to Amend Practice and Procedures in Trial Proceedings under the America Invents Act before the Patent Trial and Appeal Board, 84 Fed. Reg. 9497 (Mar. 15, 2019) (“MTA Pilot Program Notice”) (“The first option is that a patent owner may choose to receive preliminary guidance from the Board on its MTA.”). In the Preliminary Guidance, we determined that Patent Owner had satisfied the statutory and regulatory requirements. PG 3–7. We disagreed with most of Petitioner’s written description arguments (*id.* at 4–7), but “we question[ed]” the sufficiency of the disclosure for “activating and deactivating signaling circuitry ‘in response to detecting a substantially stationary position since last known location coordinate measurement,’” as recited in proposed substitute claims 21, 31, and 40 (*id.* at 6–7 (referencing MTA Opp. 6–7)). Regarding Petitioner’s patentability arguments, we determined that Petitioner had established a reasonable likelihood of showing that proposed substitute claims 21–40 are unpatentable as obvious. *Id.* at 9–12.

Patent Owner, again electing to use a pilot program option, then filed a Revised Motion to Amend. *See* RMTA; *see also* MTA Pilot Program Notice 9497 (“The second option is that a patent owner may choose to file a revised MTA after receiving petitioner's opposition to the original MTA and/or after receiving the Board's preliminary guidance.”); *see also* 35 U.S.C. § 316(d)(2) (“Additional motions to amend may be permitted . . .

by regulations prescribed by the Director.”). Like the original Motion to Amend, the Revised Motion to Amend proposes substitute claims 21–40. RMTA 26–32. In fact, the new proposed substitute claims are identical to the old proposed substitute claims except for one difference in proposed substitute claim 31. *Compare id.*, with MTA 26–31. Specifically, the Revised Motion proposes adding “by the accelerometer circuitry” to claim language that requires “detecting . . . a substantially stationary position of the electronic tracking device since last known location coordinate measurement.” RMTA 29. The other independent claims (i.e., claims 1 and 20) already included this requirement, and both versions of the corresponding proposed substitute claims (i.e., claims 21 and 40) likewise included this requirement. *See* Ex. 1001, 10:33–36 (requiring “detecting a substantially stationary position” to be performed by “the accelerometer circuitry” in claim 1), 12:34–37 (same for claim 20); *see also* MTA 26, 31; RMTA 26, 31–32.

In addition, the Revised Motion addresses the statutory and regulatory requirements of a motion to amend (RMTA 2–19), but does not address whether it satisfies the requirements of a *revised* motion to amend. The Revised Motion also argues that the Petition’s references (Miranda-Knapp and Miller) are not properly combined and fail to teach “an accelerometer detecting whether the device is in a substantially stationary position.” *Id.* at 21–24 (citing Pet. 20–23, 29–34; Ex. 1004, 4:58–5:10, 5:18–43, Fig. 5; Ex. 1011 ¶ 21)). The Revised Motion, however, does not address the teachings of the Opposition’s new reference (Zhou) or Petitioner’s proposed combination of that reference with the other references. *See id.*

Petitioner opposes the Revised Motion to Amend. RMTA Opp. In addition to disputing the substance of Patent Owner’s arguments (*see id.* at 2–11), Petitioner argues that Patent Owner’s Revised motion fails to comply with the Board’s MTA Pilot Program Notice (*id.* at 11–15) because “Patent Owner’s amendment to Claim 31 is unrelated to issues raised in either the Board’s Preliminary Guidance or Petitioner’s Opposition, as are Patent Owner’s arguments” (*id.* at 11–12).

Patent Owner filed a reply in support of its Revised Motion arguing that the amendment to claim 31 is responsive to the Preliminary Guidance. RMTA Reply 1–3, 9–10. Patent Owner also addresses the teachings and combinability of Miranda-Knapp and Miller (*see id.* at 3–9), but does not address the propriety of this line of argument (*see id.*).

Petitioner filed a sur-reply opposing the Revised Motion, which maintains that Patent Owner’s amendment and arguments are improper (RMTA Sur-reply 9–10) and responds to Patent Owner’s substantive arguments (*id.* at 1–9).

C. Improper Contents of Revised Motion to Amend

We begin by addressing Petitioner’s contention that certain aspects of Patent Owner’s Revised Motion to Amend are improper. *See* RMTA Opp. 11–15; RMTA Sur-reply 9–10.

For the reasons below, we determine that Patent Owner’s proposed amendment and written description arguments are proper, but that Patent

Owner's arguments regarding obviousness are not. As a result, we do not consider the improper obviousness arguments.¹⁷

1. Allowed Contents of Revised Motion to Amend

In the MTA Pilot Program, a patent owner may elect to file a revised motion to amend. *See* MTA Pilot Program Notice 9499–9502; *see also* Paper 14 (Order), 3–4 (instructing parties to consult the MTA Pilot Program Notice); Consolidated Trial Practice Guide 67 (same). This revised motion is permitted so that the patent owner can address issues identified in the preliminary guidance and/or the petitioner's opposition to the motion to amend. *See* MTA Pilot Program Notice 9499–9500; *see also id.* at 9501 (stating that these papers provide “good cause,” allowing authorization of an additional motion to amend (quoting 37 C.F.R. § 42.121(c))).

“A revised MTA includes one or more new proposed substitute claims in place of previously presented substitute claims to address issues identified in the preliminary guidance and/or the petitioner's opposition.” MTA Pilot Program Notice 9499. It may also include new arguments and evidence that are related to issues identified in those papers:

A revised MTA must provide amendments, arguments, and/or evidence in a manner that is responsive to issues raised in the preliminary guidance and/or petitioner's opposition to the MTA. A revised MTA may not include amendments, arguments, and/or evidence that are unrelated to issues raised in the preliminary guidance and/or petitioner's opposition to the MTA.

Id. at 9498.

¹⁷ Although we decline to consider these arguments because they are procedurally improper, Petitioner nevertheless bears the burden to show that the proposed substitute claims are unpatentable. *See infra* § III.F.

2. Amendment to Proposed Substitute Claim 31 & Written Description Arguments

We are persuaded that Patent Owner’s amendment to proposed substitute claim 31 and its written description arguments (*see* RMTA 4–19) are responsive to the Preliminary Guidance and, thus, are properly included in the Revised Motion to Amend.

The Preliminary Guidance notes a potential written description issue:

[W]e question whether there is sufficient disclosure to inform a person of ordinary skill in the art (“POSITA”) of activating and deactivating signaling circuitry “in response to detecting a substantially stationary position since last known location coordinate measurement,” as the limitation also requires. There appears to be no record evidence or testimony about this issue, and Patent Owner has not had an opportunity to respond to Petitioner’s contentions. Thus, in subsequent papers, the parties should address whether a POSITA would have understood paragraphs 32 and 37 (and other relevant paragraphs) of the ’905 application^[18] to disclose these aspects of the proposed substitute claims.

PG 7. In its Revised Motion, Patent Owner states:

Of note, claim 21 of the ’905 application recites, in part, “a battery power monitor configured to activate and deactivate at least one portion of signaling circuitry in response to the accelerometer circuitry detecting a substantially stationary position of the electronic tracking device since last known location coordinate measurement.” Ex. 2015 at p. 20. It is well known that an originally filed claim may be fully self-supporting for § 112 purposes.

¹⁸ The ’619 patent issued from Application No. 13/356,643 (“the ’643 application”; Ex. 2018), and it claims priority to Application No. 11/969,905 (“the ’905 application”; Ex. 2015). Ex. 1001, codes (21), (62).

RMTA 4–5. In addition, in its table identifying written description support, Patent Owner adds the corresponding quotation from the '905 application and also adds a quotation from a similar portion of the '643 application. *Compare* MTA 6, 12, 17, *with* RMTA 6–7, 13, 19; *see also infra* § III.E.4 (addressing written description support). These arguments are directly responsive to the concern identified by the Preliminary Guidance.

Also, Patent Owner amends claim 31 to add a limitation specifying that the claimed “detecting” is performed “by the accelerometer circuitry.” RMTA 29. Patent Owner explains that the relied-upon language from the priority documents includes this requirement, and Patent Owner states that the amendment is made “[i]n order to ensure written description support.” RMTA Reply 9–10.

Petitioner argues that the amendment is not “provided in a manner responsive to the Board’s § 112 issues,” as required by the MTA Pilot Program Notice. RMTA Sur-reply 9–10. Petitioner observes that “[n]ot once in its RMTA did Patent Owner refer to the Board’s Preliminary Guidance or the written description issue raised by the Board.” *Id.* at 9.

Although we would have preferred it if Patent Owner had directly addressed the propriety of this amendment in its Revised Motion to Amend (*see* RMTA), we are nonetheless persuaded by Patent Owner’s reply argument that the amendment was made in a manner responsive to the Preliminary Guidance. In particular, Patent Owner persuasively argues that the amendment to proposed substitute claim 31 is designed to address a potential written description issue in this claim. *See* RMTA Reply 9–10.

Accordingly, we are persuaded that the amendment to proposed substitute claim 31 and Patent Owner's written description arguments are proper.

3. *Obviousness Arguments*

In the Revised Motion to Amend, Patent Owner argues that the Petition's original references (Miranda-Knapp and Miller) are not properly combined and also fail to teach elements 21[c], 31[d], and 40[c] of the proposed substitute claims. *See* RMTA 21–24. These elements of the proposed substitute claims are substantially the same as elements found in original claims 1 and 20. *Compare id.* (arguing that the references do not teach an accelerometer detecting whether the device is in a substantially stationary position), *with* Ex. 1001, 10:31–36 (original claim 1 recites “accelerometer circuitry detecting a substantially stationary position of the electronic tracking device”), 12:33–38 (same in original claim 20); *see also* RMTA 26, 31–32 (not amending this claim language). Petitioner contends that these arguments are improper. RMTA Opp. 11–12, 14–15 (citing MTA Pilot Program Notice); *see also* RMTA Sur-reply 9–10.

We determine that these obviousness arguments are not properly included in the Revised Motion to Amend because they are not responsive to any issue raised in either the Preliminary Guidance or Petitioner's original Opposition to the Motion to Amend. *See* MTA Pilot Program Notice 9498.

First, the arguments in the Revised Motion to Amend are not responsive to any issue raised in Petitioner's original Opposition. That paper does not discuss elements 21[c], 31[d], and 40[c] or the combinability of Miranda-Knapp and Miller; rather, it simply refers back to the Petition for

these topics. Specifically, for elements 21[c] and 31[d], the original Opposition only states:

As set forth in the Petition, *Miranda-Knapp* and *Miller* render obvious Claims 1 and 11 of the '619 Patent. *Petition* (Paper 1), 13-20, 23-43, 54-58. For the same reasons set forth in the Petition, the *Miranda-Knapp/Miller/Zhou* combination renders obvious claims 21[P], [21(a)], [21(c)], 31[P], [31(a)], [31(d)], and 31(e) of the '619 Patent. *Id.*; *Suppl. Dec.*, ¶ 26.

MTA Opp. 9. For element 40[c], the original Opposition only states:

As set forth in the Petition, the *Miranda-Knapp/Miller* combination renders obvious the original limitations of Claim 20. *Petition*, 57-58. For the same reasons set forth in the Petition, the *Miranda-Knapp/Miller/Zhou* combination renders obvious claims 40[P], [40(a)], and [40(c)]. *Id.*; *Suppl. Dec.*, ¶ 52.

Id. at 21. In fact, Patent Owner's obviousness arguments similarly refer to the same cited portions of the Petition, not Petitioner's original Opposition. RMTA 21–23 (citing Pet. 29–39); *see also* RMTA Reply 3–9.¹⁹

Second, these arguments are not responsive to the Preliminary Guidance. That paper includes no reference to the teachings or combinability of *Miranda-Knapp* and *Miller*, aside from a passing reference to a contention in Patent Owner's Motion to Amend. *See* PG 10. At the hearing, Patent Owner contended that its arguments are responsive to the Preliminary Guidance because the Preliminary Guidance found that Petitioner had established a reasonable likelihood of success on its obviousness grounds. Tr. 108:23–109:19. We disagree with that overly generalized assertion. Arguments must be made “in a manner that is

¹⁹ In the RMTA Reply, Patent Owner cites “*Opp.*,” but this refers to Petitioner's Opposition *to the Revised Motion* (Paper 33)), not the original Opposition to the Motion to Amend (Paper 25).

responsive to issues raised in the preliminary guidance” or opposition. MTA Pilot Program Notice 9498. Patent Owner identifies no “issue[] raised in the preliminary guidance” to which it is responding, and we do not agree that Patent Owner’s arguments are “in a manner responsive” to the Preliminary Guidance’s determination of a reasonable likelihood of success. *Id.* Indeed, the relevant portion of the briefing makes no reference to the Preliminary Guidance. *See* RMTA 21–24; RMTA Reply 3–9. Moreover, Patent Owner identifies no other potential justification for these arguments (*see* RMTA Reply; *see also* RMTA), and we discern none.

Accordingly, we determine that the obviousness arguments presented by Patent Owner in the Revised Motion to Amend (*see* RMTA 21–24) are improper, so we decline to consider them. As a result, we also do not consider Petitioner’s responses to those improper arguments or Patent Owner’s reply on this topic. *See* RMTA Opp. 2–11; RMTA Reply 3–9; RMTA Sur-reply 1–9.²⁰

D. Claim Construction

Patent Owner contends that the terms in the proposed substitute claims do not require construction. RMTA 20. *But see* MTA 18–20 (addressing the construction of newly added limitations). Petitioner does not propose a construction of any term or phrase in these claims. *See* MTA

²⁰ Moreover, even if the obviousness arguments presented in the Revised Motion were considered proper, Patent Owner also presents arguments in its Reply that were not advanced in the Revised Motion and are not fairly responsive to Petitioner’s Opposition. *See* RMTA Reply 3–4 (arguing that Miranda-Knapp fails to teach activating circuitry), 6–7 (distinguishing substantially stationary from true rest). These arguments are untimely.

Opp.; RMTA Opp. We need not expressly construe any claim terms or phrases to resolve the parties' dispute. *See Nidec Motor*, 868 F.3d at 1017; *accord* PG 9 (making same determination).

E. Statutory and Regulatory Requirements

“Before considering the patentability of any substitute claims, . . . the Board first must determine whether the Motion to Amend meets the statutory and regulatory requirements set forth in 35 U.S.C. § 316(d) and 37 C.F.R. § 42.121.” *Lectrosonics, Inc. v. Zaxcom, Inc.*, IPR2018-01129, Paper 15, 4–8 (PTAB Feb. 25, 2019) (precedential). Specifically, Patent Owner must demonstrate: (1) the amendment proposes a reasonable number of substitute claims; (2) the amendment responds to a ground of unpatentability involved in the trial; (3) the amendment does not seek to enlarge the scope of the claims of the patent or introduce new subject matter; and (4) the proposed claims are supported in the original disclosure. *See* 35 U.S.C. § 316(d); 37 C.F.R. § 42.121.

We are persuaded that Patent Owner has satisfied these requirements.

1. Reasonable Number of Substitute Claims

Patent Owner contends that its motion proposes a reasonable number of substitute claims because it proposes one substitute claim for each challenged claim. RMTA 4. Petitioner does not dispute Patent Owner's contention. *See* RMTA Opp.; *see also* MTA Opp.

We are persuaded that Patent Owner proposes a reasonable number of substitute claims because it proposes one substitute claim for each challenged claim. *See Lectrosonics*, Paper 15 at 4 (“There is a rebuttable

presumption that a reasonable number of substitute claims per challenged claim is one (1) substitute claim.”); *see also* 37 C.F.R. § 42.121(a)(3).

2. Respond to a Ground of Unpatentability

Patent Owner contends that its motion responds to a ground of unpatentability. RMTA 3; *see also* MTA 21–25 (addressing why added limitations distinguish over cited references). Petitioner does not dispute Patent Owner’s contention. *See* RMTA Opp.; *see also* MTA Opp.

We determine that the proposed amendments are responsive to a ground of unpatentability involved in this trial because the amendments specify that the claimed displacements are associated with an *individual’s* movements, whereas the original claims were found to be unpatentable over the combination of Miranda-Knapp and Miller based on its teaching of displacements associated with an *object’s* movements (*e.g.*, Pet. 23). Also, as discussed above, we are persuaded that the additional amendment to claim 31 (adding “by the accelerometer circuitry”) is permissible to address a potential written description issue. *See Lectrosonics*, Paper 15 at 5–6 (“[O]nce a proposed claim includes amendments to address a prior art ground in the trial, a patent owner also may include additional limitations to address potential § 101 or § 112 issues, if necessary.”).

3. Scope of the Claims

Patent Owner asserts that the proposed substitute claims are narrower than the corresponding original claims because the amendments “retain all features of the original claims” and “add only narrowing features.” RMTA 2–3. Petitioner does not dispute Patent Owner’s contention. *See* RMTA Opp.; *see also* MTA Opp.

The amendments replace claim language reciting “movements of an object or individual” with “movements of an individual” (RMTA 26, 29), or otherwise add new limitations in the proposed substitute claims (*id.* at 29, 31). Accordingly, we are persuaded that the proposed substitute claims do not enlarge the scope of the claims.

4. Support in the Original Disclosure

A motion to amend may not introduce new matter. 35 U.S.C. § 316(d); 37 C.F.R. § 41.121(a)(2)(ii). “New matter is any addition to the claims without support in the original disclosure.” *Lectrosonics*, Paper 15 at 7 (citing *TurboCare Div. of Demag Delaval Turbomach. v. Gen. Elec. Co.*, 264 F.3d 1111, 1118 (Fed. Cir. 2001)). To this end, the motion to amend must “set forth written description support in the originally filed disclosure of the subject patent for each proposed substitute claim, and also set forth support in an earlier filed disclosure for each claim for which benefit of the filing date of the earlier filed disclosure is sought.” *Id.* (citing 37 C.F.R. § 42.121(b)(1)–(2)).

Patent Owner contends that the proposed substitute claims are supported by the ’643 application and the ’905 application (RMTA 4), and Patent Owner provides a table identifying each claim limitation and the corresponding support in both applications by paragraph or by page and line number (*id.* at 5–19).

Petitioner does not dispute Patent Owner’s contentions in its Opposition to the Revised Motion to Amend. *See* RMTA Opp. Previously, Petitioner argued that the proposed substitute claims lacked written description support for three phrases: “transceiver circuitry” (MTA Opp. 3–4), “activat[ing] and deactivat[ing] at least one portion of signaling circuitry

in response to . . . detecting a substantially stationary position of the electronic tracking device since last known location coordinate measurement” (*id.* at 4–7), and “battery power monitor” (*id.* at 7–8). In our Preliminary Guidance, we explained why we do not agree with these arguments (*see* PG 4–7), except that we “question[ed]” the sufficiency of the disclosure for “activating and deactivating signaling circuitry ‘in response to detecting a substantially stationary position since last known location coordinate measurement,’” as recited in proposed substitute claims 21, 31, and 40 (*id.* at 6–7 (referencing MTA Opp. 6–7)). Patent Owner’s Revised Motion to Amend addresses this concern by pointing to a claim in the original ’905 application that recites a commensurate limitation. RMTA 4–5 (stating that “[i]t is well known that an originally filed claim may be fully self-supporting for § 112 purposes”); *see also id.* at 7, 13, 19 (citing Ex. 2015, 20:20–23; Ex. 2018, 21). This argument is persuasive. Petitioner does not respond to our analysis in the Preliminary Guidance or to Patent Owner’s additional written description arguments. *See* RMTA Opp.

Accordingly, we are persuaded that Patent Owner has shown that the ’643 and ’905 applications each provide written description support for the proposed substitute claims.

F. Petitioner’s Challenges to the Proposed Substitute Claims

“A petitioner bears the burden of persuasion to show, by a preponderance of the evidence, that any proposed substitute claims are unpatentable.” 37 C.F.R. § 42.121(d)(2); *see also Lectrosonics*, Paper 15 at 4 (citing *Aqua Prods. Inc. v. Matal*, 872 F.3d 1290 (Fed. Cir. 2017); *Bosch Auto. Serv. Sols. LLC v. Iancu*, 878 F.3d 1027 (Fed. Cir. 2017)). In determining whether a petitioner has proven unpatentability of the proposed

substitute claims, the Board focuses on “arguments and theories raised by the petitioner in its petition or Opposition to the Motion to Amend.” *Nike, Inc. v. Adidas AG*, 955 F.3d 45, 51 (Fed. Cir. 2020).

We are persuaded that Petitioner has shown, by a preponderance of the evidence, that the subject matter of proposed substitute claims 21–40 would have been obvious; however, Petitioner has not shown that the proposed substitute claims 21–40 lack written description support.

1. Written Description

As noted above (*see supra* § III.E.4), in its original Opposition, Petitioner contended that proposed substitute claims 21–40 fail to comply with the written description requirement. MTA Opp. 3–8. In our Preliminary Guidance, we stated that “it does not appear, on this record, that Petitioner has shown a reasonable likelihood that the Specification lacks adequate written description” for the identified claim limitations, except that “we [did] not take a position on Petitioner’s contention that the Specification lacks adequate written description support for activating and deactivating ‘in response to the accelerometer circuitry detecting a substantially stationary position of the electronic tracking device since last known location coordinate measurement,’ as the substitute claims also require.” PG 8 (citing *id.* at 5–7). In its Revised Motion to Amend, Patent Owner identifies written description support for that remaining issue. *See supra* § III.E.4 (citing RMTA 4–5, 7, 13, 19 (citing Ex. 2015, 20:20–23; Ex. 2018, 21)). And, in its Opposition to the Revised Motion to Amend, Petitioner does not respond to our analysis in the Preliminary Guidance or Patent Owner’s additional arguments regarding written description support. *See* RMTA Opp.

Accordingly, for the reasons previously explained in the Preliminary Guidance, and given the additional support identified by the Patent Owner in the Revised Motion to Amend, we determine that Petitioner has not shown, by a preponderance of the evidence, that any of proposed substitute claims 21–40 are unpatentable for failing to comply with 35 U.S.C. § 112 ¶ 1.

2. *Obviousness*

Petitioner contends that proposed substitute claims 21–40 are unpatentable as obvious based on the following grounds (*see* MTA Opp. 8–25; PG 9; *see also* RMTA Opp. 2–3):

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
21, 25, 26, 28–31, 35, 36, 38–40	103(a)	Miranda-Knapp, Miller, Zhou ²¹
22	103(a)	Miranda-Knapp, Miller, Vaganov, Zhou
23, 24, 32–34	103(a)	Miranda-Knapp, Miller, Cervinka, Zhou
27, 37	103(a)	Miranda-Knapp, Miller, Herrero, Zhou

In particular, Petitioner relies upon its contentions from the Petition, argues that the newly-added limitations are taught by Zhou, and contends that it would have been obvious to add Zhou to the combinations of Miranda-Knapp and Miller. MTA Opp. 8–24.

As explained below, we are persuaded, by a preponderance of the evidence, that the subject matter of the proposed substitute claims would have been obvious over the asserted combinations of references.

²¹ US 6,847,892 B2, issued Jan. 25, 2005 (Ex. 1076).

a. Summary of Zhou (Ex. 1076)

Zhou describes a device that locates and monitors an individual or object using a GPS system and sensors. *E.g.*, Ex. 1076, 2:62–67. In one embodiment, Zhou’s device is worn by an individual. *Id.* at 4:62–5:2; *see also id.* at 6:25–40 (device may also be a single component rather than separate watch and belt components), 48:7–32 (contemplating monitoring an Alzheimer patient or a child with the device), 49:16–31 (contemplating monitoring athlete with device). Zhou teaches that its device includes an accelerometer whose output that can “indicate[] a fall.” *Id.* at 5:24–32; *see also id.* at 3:12–15 (describing accelerometer), 27:66–28:23 (describing fall detection). The device also includes a GPS receiver to track the location of the individual wearing the device. *Id.* at 5:36–40.

b. Proposed Substitute Independent Claim 21

(1) Elements 21[pre], 21[a], and 21[c]

Petitioner contends that the combination of Miranda-Knapp and Miller teaches the preamble of proposed substitute claim 21, as well as elements 21[a] and 21[c], for the reasons explained for original claim 1. MTA Opp. 9 (citing Pet. 13–20, 23–43).

Patent Owner argues that the Miranda-Knapp and Miller are not properly combined and fail to teach element 21[c]. *See* RMTA 21–24; *see also* RMTA Sur-reply 3–9. However, as explained above, these arguments are not properly presented in a revised motion to amend. *See supra* § III.C.3. Thus, we do not consider them. Moreover, to the degree these arguments were properly presented with respect to claim 1, those arguments are not persuasive for the reasons explained above. *See supra* § II.D.1.d.

For the reasons explained above with respect to claim 1, we are persuaded that Miranda-Knapp teaches the language of the preamble and element 21[a], and that the combination of Miranda-Knapp and Miller teaches element 21[c]. *See supra* §§ II.D.1.a (preamble of claim 1), II.D.1.b (transceiver circuitry), II.D.1.d (battery power monitor). We note that this claim language has not been amended.

(2) Element 21[b] and Rationale to Combine

Element 21[b] recites: “accelerometer circuitry to measure displacements of the portable electronic tracking device, wherein the displacements comprise movements of an individual associated with the device.” Petitioner points to Miranda-Knapp and Zhou for this claim language. MTA Opp. 10–17. Specifically, Petitioner relies on the Petition’s showing that a person of ordinary skill in the art would have understood Miranda-Knapp to disclose an accelerometer 20 that measures accelerations associated with the movement and displacements of device 10. *Id.* at 10 (citing Pet. 20–23). Petitioner contends that Zhou teaches a portable device that includes an accelerometer used to detect movements of an individual wearing the portable tracking device “such as, for example, a human falling.” *Id.* at 10–12 (citing Ex. 1076, 2:62–67, 3:12–15, 5:24–31, 6:25–41).

In addition, Petitioner contends that a person of ordinary skill in the art would have been motivated to modify the Miranda-Knapp–Miller combination to detect human falls, as taught by Zhou, in order to enhance the functionality of the system. MTA Opp. 12–17 (citing Ex. 1077 ¶¶ 31–39). Specifically, Petitioner points to Zhou’s disclosure of using its device to monitor elderly individuals, children, and athletes engaging in extreme

sports. *Id.* at 12–13 (citing Ex. 1076, 48:7–32, 49:16–31; Ex. 1077 ¶ 32). Mr. Andrews testifies that “the use of portable devices to measure displacements comprising human movement (including fall detection) was a well-known and common concept.” Ex. 1077 ¶ 39 (citing *id.* ¶¶ 4–9 (identifying evidence in support)). Mr. Andrews further testifies that an ordinary artisan “would have recognized that, with the exception of potentially slightly different acceleration levels, there is no meaningful difference between using accelerometer measurements for detecting a device fall in comparison to using accelerometer measurements for detecting the fall of an individual wearing the device.” *Id.* ¶ 35. In addition, Mr. Andrews testifies that the ordinary artisan would have had a reasonable expectation of success in making the proposed modification. *Id.* ¶ 36; *see also id.* ¶¶ 33–34, 37 (identifying similar components and function in Zhou and either Miranda-Knapp or Miller).

Patent Owner does not dispute Petitioner’s contentions for this claim element, or Petitioner’s proposed combination of Zhou with the other references. *See* RMTA; RMTA Reply; *see also* Tr. 109:20–110:7.

We are persuaded that Petitioner has shown that the combination of Miranda-Knapp and Zhou teaches element 21[b]. In particular, as explained in the context of claim 1 (*see supra* § II.D.1.c), we are persuaded that a person of ordinary skill in the art would have understood Miranda-Knapp to disclose that accelerometer 20 measures accelerations associated with displacements of portable device 10. *See, e.g.*, Ex. 1004, 2:52–57, 3:2–10, 4:4–32; Ex. 1003 ¶¶ 135–137. Zhou describes an embodiment where “belt unit 204 includes a fall-down sensor comprising a two-axis accelerometer, the output of which is interpreted by the belt unit’s microprocessor.”

Ex. 1076, 5:24–27. “[T]he accelerometer output indicates a fall (or sudden change in posture) when based on the user’s sudden change in acceleration and sudden deceleration or stop.” *Id.* at 5:28–31. Accordingly, we are persuaded that Zhou discloses an accelerometer that measures displacements of a tracking device, wherein the displacements comprise movements of an individual associated with the device. *See also, e.g., id.* at 3:12–15, 4:62–5:6, 6:25–41, 27:66–28:23; Ex. 1077 ¶ 29.

In addition, Mr. Andrews testifies that a person of ordinary skill in the art would have been motivated to add Zhou’s detection of human falls to the combination of Miranda-Knapp and Miller, and that the ordinary artisan would have had a reasonable expectation of success in doing so. Ex. 1077 ¶¶ 31–39. We credit his testimony because it is logical, substantiated with analysis, and supported by the cited evidence. Accordingly, we are persuaded that a person of ordinary skill in the art would have been motivated to combine Miranda-Knapp, Miller, and Zhou as proposed by Petitioner.

(3) Element 21[d]

Finally, element 21[d] recites: “processor circuitry configured to process the displacements, to associate the displacements with a specified pattern, and to generate an alert message in response to the specified pattern.” Petitioner contends that the proposed combination of Miranda-Knapp, Miller, and Zhou also teaches associating displacements comprising human movement with a specified pattern, generating an alert message in response to specified pattern, and processing the displacements. Opp. 17–21. Petitioner also contends that a person of ordinary skill in the art would

have been motivated to combine Miranda-Knapp, Miller, and Zhou for the same reasons as discussed in element 21[b]. *Id.* at 18–19.

Patent Owner does not dispute Petitioner’s contentions for this claim element. *See* RMTA; RMTA Reply.

Petitioner explains why, in the proposed combination including Zhou, Miranda-Knapp would still teach this claim limitation. Thus, for the reasons explained above and with respect to claim 1, we are persuaded that Petitioner has shown that the proposed combination of Miranda-Knapp, Miller, and Zhou teaches element 21[d] and that a person of ordinary skill in the art would have been motivated to combine Miranda-Knapp, Miller, and Zhou. *See supra* §§ II.D.1.e (addressing “processor circuitry” element of claim 1), III.F.2.b.2 (addressing rationale to combine references). We note that this claim language has not been amended.

(4) Conclusion

Petitioner has shown that each limitation of proposed substitute claim 21 is taught by the proposed combination of Miranda-Knapp, Miller, and Zhou, and that it would have been obvious to combine Miranda-Knapp, Miller, and Zhou in the manner proposed. Accordingly, we determine that Petitioner has shown, by a preponderance of the evidence, that the subject matter of proposed substitute claim 21 would have been obvious over Miranda-Knapp, Miller, and Zhou.

c. Proposed Substitute Independent Claims 31 and 40

The analysis of proposed substitute independent claims 31 and 40 is substantially the same as the analysis of proposed substitute independent claim 21.

In particular, Petitioner contends that the combination of Miranda-Knapp and Miller teaches the preamble of claims 31 and 41, as well as elements 31[a], 31[d], 31[e], 40[a] and 40[c] for the reasons explained in the Petition. MTA Opp. 9 (citing Pet. 54–58), 21 (citing Pet. 57–58). Further, Petitioner contends that the proposed combination of Miranda-Knapp, Miller, and Zhou teaches the remaining limitations of these claims—i.e., elements 31[b], 31[c], 30[b], and 40[d]—and that that it would have been obvious to combine these references. *Id.* at 10–24. Petitioner’s analysis of these claims relies on substantially the same analysis and contentions as that provided for proposed substitute claim 21 and the original independent claims.

Patent Owner does not dispute these contentions, other than as noted for proposed substitute claim 21. *See* RMTA; RMTA Reply.

For the reasons explained above with respect to the original independent claims²² and proposed substitute claim 21, we are persuaded that the combination of Miranda-Knapp, Miller, and Zhou teaches each limitation of proposed substitute claims 31 and 40, and that that it would have been obvious to combine these references. *See supra* §§ II.D.1.f (claims 11 and 20), III.E.2.b (claim 21). Accordingly, we determine that Petitioner has shown, by a preponderance of the evidence, that the subject matter of proposed substitute claims 31 and 40 would have been obvious over Miranda-Knapp, Miller, and Zhou

²² In element 31[d], Patent Owner adds a requirement that the detection of a substantially stationary position be performed “by accelerometer circuitry.” Original independent claims 1 and 20 already include this requirement, so we rely on our prior analysis of those limitations.

d. Proposed Substitute Dependent Claims 22–30 and 32–39

Proposed substitute claims 22–30 depend from proposed substitute claim 21 and are the same as original claims 2–10 except that the claim dependencies have been updated. Proposed substitute claims 32–39 depend from proposed substitute claim 31 and are the same as original claims 12–19 except that the claim dependencies have been updated.

We have analyzed all limitations of proposed substitute claims 22–30 and 32–39 above, and we find that Petitioner has shown that the limitations recited by these claims are taught by the proposed combination of references. *See supra* §§ II.D.2–9. In addition, we have explained why we are persuaded that a person of ordinary skill in the art would have been motivated to combine Miranda-Knapp and Miller with Vaganov (*see supra* §§ II.D.2), Cervinka (*see supra* §§ II.D.3–4), Herrero (*see supra* §§ II.D.7), and Zhou (*see supra* § III.E.2.b).

Patent Owner does not separately address the patentability of any of these dependent claims. *See* RMTA; RMTA Reply.

We are persuaded that the subject matter of these substitute dependent claims would have been obvious over the identified combination of references. In particular, we determine that Petitioner has shown, by a preponderance of the evidence: the subject matter of proposed substitute claims 25, 26, 28–30, 35, 36, 38, and 39 would have been obvious over the combination of Miranda-Knapp, Miller, and Zhou; the subject matter of proposed substitute claim 22 would have been obvious over the combination of Miranda-Knapp, Miller, Vaganov, and Zhou; the subject matter of proposed substitute claims 23, 24, and 32–34 would have been obvious over

the combination of Miranda-Knapp, Miller, Cervinka, and Zhou; and the subject matter of proposed substitute claims 27 and 37 would have been obvious over the combination of Miranda-Knapp, Miller, Herrero, and Zhou.

IV. CONCLUSION²³

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. In addition, Patent Owner's Revised Motion to Amend is denied because Petitioner has shown by a preponderance of the evidence that proposed substitute claims 21–40 would have been obvious.

In summary:

²³ 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).

Claim(s)	35 U.S.C. §	References/ Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1, 5, 6, 8– 11, 15– 16, 18–20	103(a)	Miranda-Knapp, Miller	1, 5, 6, 8–11, 15–16, 18–20	
2	103(a)	Miranda-Knapp, Miller, Vaganov	2	
3, 4, 12– 14	103(a)	Miranda-Knapp, Miller, Cervinka	3, 4, 12–14	
7, 17	103(a)	Miranda-Knapp, Miller, Herrero	7, 17	
Overall Outcome			1–20	

Motion to Amend Outcome	Claim(s)
Original Claims Cancelled by Amendment	
Substitute Claims Proposed in the Amendment	21–40
Substitute Claims: Motion to Amend Granted	
Substitute Claims: Motion to Amend Denied	21–40
Substitute Claims: Not Reached	

V. ORDER

Accordingly, it is

ORDERED that claims 1–20 of U.S. Patent No. 8,421,619 B2 are determined to be unpatentable;

FURTHER ORDERED that Patent Owner’s Revised Motion to Amend (Paper 30) is *denied*; 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.

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Patent 8,421,619 B2

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