

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,
Petitioner,

v.

LBT IP I LLC,
Patent Owner.

IPR2020-01189
Patent 8,497,774 B2

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

HUDALLA, *Administrative Patent Judge*.

JUDGMENT

Final Written Decision on Remand
Determining No Remaining Challenged Claims Unpatentable
35 U.S.C. §§ 144, 318(a)

I. INTRODUCTION

This Remand Decision is a final written decision on remand from the United States Court of Appeals for the Federal Circuit, which vacated and remanded certain parts of our original Final Written Decision (Paper 39, “Final Dec.”) in this *inter partes* review. *See LBT IP I LLC v. Apple Inc.*,

No. 2022-1613, 2023 WL 3914920 (Fed. Cir. June 9, 2023).¹ In particular, the Federal Circuit vacated and remanded our obviousness determinations with respect to claims 8, 10, 13, and 15 of U.S. Patent No. 8,497,774 B2 (Ex. 1001, “the ’774 patent”). Paper 42, 13.

We have jurisdiction under 35 U.S.C. § 6, and we issue this Final Written Decision on Remand under 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons discussed below, Apple Inc. (“Petitioner”) has not demonstrated by a preponderance of the evidence that remaining challenged claims 8, 10, 13, and 15 of the ’774 patent are unpatentable.

A. Background

Petitioner filed a Petition (Paper 1, “Pet.”) requesting an *inter partes* review of claims 1, 4–6, 8, 10, 13, and 15 (“the challenged claims”) of the ’774 patent. LBT IP I LLC (“Patent Owner”) filed a Preliminary Response. Paper 8. Taking into account the arguments presented in Patent Owner’s Preliminary Response, we determined that the information presented in the Petition established that there was a reasonable likelihood that Petitioner would prevail with respect to its unpatentability challenges. Pursuant to 35 U.S.C. § 314, we instituted this proceeding on March 4, 2021, as to all challenged claims and all asserted grounds of unpatentability, which are reproduced below (Paper 9 (“Dec. on Inst.”)):

¹ A copy of the Federal Circuit’s decision has been entered as Paper 42, to which we will refer hereinafter.

Claims Challenged	35 U.S.C. §	References/Basis
1, 4–6, 8, 10, 13, 15	103(a) ²	Sakamoto ³
1, 4–6, 8, 10, 13, 15	103(a)	Sakamoto, AAPA ⁴
1, 4–6, 8, 10, 13, 15	103(a)	Sakamoto, Hayasaka ⁵

During the course of trial, Patent Owner filed a Patent Owner Response (Paper 17, “PO Resp.”), and Petitioner filed a Reply to the Patent Owner Response (Paper 25, “Pet. Reply”). Patent Owner also filed a Sur-reply.⁶ Paper 31 (“PO Sur-reply”).

Petitioner filed Declarations of Scott Andrews with its Petition (Ex. 1003) and with its Reply (Ex. 1077). Both parties filed a transcript of the deposition of Mr. Andrews. Exs. 1068, 2003.

An oral hearing was held on December 8, 2021, and a transcript of the hearing is included in the record. Paper 38 (“Tr.”).

² The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125 Stat. 284, 287–88 (2011), amended 35 U.S.C. §§ 102, 103, and 112. Because the application leading to the ’774 patent was filed before March 16, 2013 (the effective date of the relevant amendments), the pre-AIA versions of §§ 102 and 103 apply.

³ Japanese Unexamined Patent Application Publication No. JP 2004-37116A, published Feb. 5, 2004 (Ex. 1004, “Sakamoto”). Sakamoto is a Japanese-language publication (Ex. 1004, 36–49, 58) that was filed with an English-language translation (*id.* at 1–19, 21–34, 52–56) and declarations attesting to the accuracy of the translation (*id.* at 20, 50). Our citations to Sakamoto herein refer to the translation.

⁴ Applicants’ Admitted Prior Art (Ex. 1001, 11:22–30, “AAPA”).

⁵ U.S. Patent No. 5,845,142, filed Aug. 29, 1997, issued Dec. 1, 1998 (Ex. 1011, “Hayasaka”).

⁶ The parties also filed papers related to Patent Owner’s motion to amend, but the motion to amend is not within the scope of the instant remand.

We issued a Final Written Decision determining, *inter alia*, that Petitioner demonstrated by a preponderance of the evidence that claims 1, 4–6, 8, 10, 13, and 15 of the ’774 patent are unpatentable. Final Dec. 68. As part of our analysis for claims 8, 10, 13, and 15, we determined that the term “multitude” in the recited “multitude of threshold values” of claim 8 may include two threshold values. *Id.* at 12–18. We applied this interpretation as part of our determination that claims 8, 10, 13, and 15 would have been obvious over Sakamoto under 35 U.S.C. § 103(a). *Id.* at 37–44.

On June 9, 2023, the Federal Circuit issued an opinion vacating and remanding our obviousness determinations with respect to claims 8, 10, 13, and 15 of the ’774 patent.⁷ Paper 42, 13. The court’s decision was based on its construction of “multitude of threshold values” in the following limitation of claim 8:

wherein the battery power level monitor measures a power level of the charging unit and adjusts a power level applied to location tracking circuitry responsive to one or more signal levels, the power level comprising a *multitude of threshold values* determined by a user or system administrator to intermittently activate or deactivate the location tracking circuitry to conserve power of the charging unit in response to the estimated charge level of the charging unit.

Ex. 1001, 16:53–61 (emphasis added). The court stated that “[t]he plain and ordinary meaning of multitude in the ’774 patent does not encompass two threshold values.” Paper 42, 11. Further clarifying its construction, the court stated that “[w]e hold only that multitude does not include two but

⁷ Patent Owner did not appeal our obviousness determinations regarding claims 1 and 4–6 or our denial of Patent Owner’s motion to amend. *See* Paper 42, 9.

must include as few as five threshold values.” *Id.* at 13. Thus, the court vacated our determination that Sakamoto’s two battery power level thresholds teach the claimed “multitude of threshold values.” *Id.*

The court also noted that we did not address Petitioner’s alternative argument that Sakamoto teaches at least four threshold values—two battery level thresholds and two GPS signal level thresholds. Paper 42, 13. Accordingly, the court remanded this case to us to determine “whether multitude encompasses three or four threshold values and whether the two sets of threshold values disclosed in Sakamoto teach a multitude of threshold values.” *Id.*

On remand, we asked the parties to brief whether—as a matter of claim construction—the “threshold values” in the recited “multitude of threshold values” of claim 8 are limited to battery power level threshold values or whether they may also include signal level threshold values. Paper 43, 3. Petitioner filed an opening brief (Paper 45, “Pet. Remand Br.”) and a responsive brief (Paper 46, “Pet. Remand Resp.”). In parallel, Patent Owner also filed an opening brief (Paper 44, “PO Remand Br.”) and a responsive brief (Paper 47, “PO Remand Resp.”).

B. The ’774 patent

The ’774 patent is directed to location and tracking communication systems. Ex. 1001, 1:33–34. Figure 1 of the ’774 patent is reproduced below.

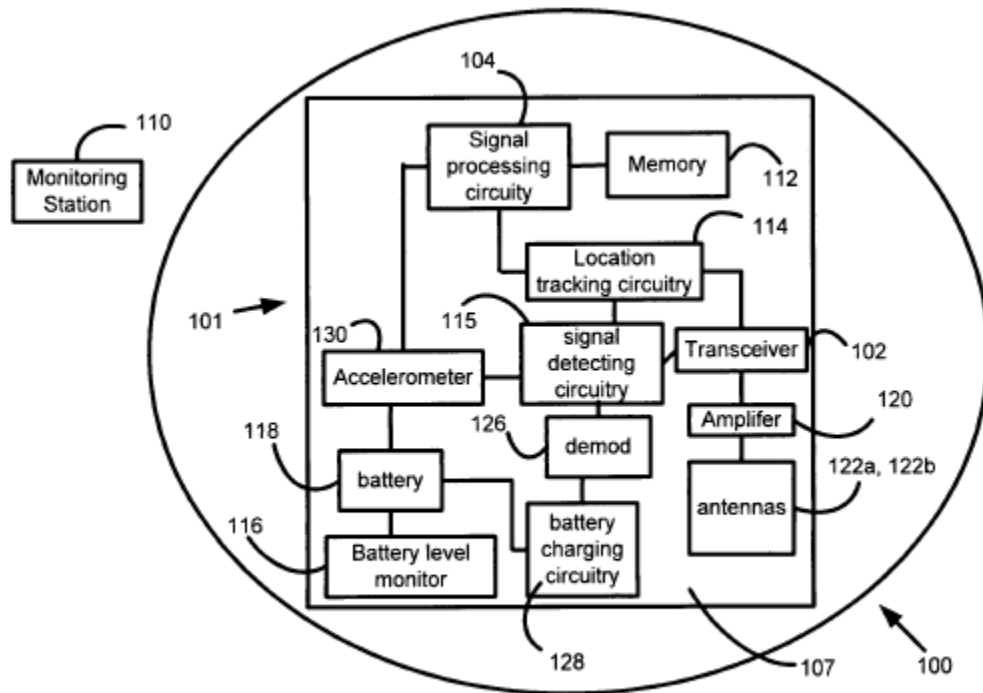


Figure 1

Figure 1 depicts a schematic of tracking device 100, which 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 4:62–64, 6:54–57. Location tracking circuitry 114 (e.g., global positioning system (GPS) circuitry) calculates location data received and sends the data to signal processing circuitry 104. *Id.* at 7:17–19. Signal detecting circuitry 115 detects and measures signal power level. *Id.* at 7:22–23. Battery level monitor 116 detects a battery level of battery 118. *Id.* at 7:25–28.

Tracking device 100 periodically checks availability of a GPS signal by performing a GPS signal acquisition to determine if a receive communication signal is above a first signal level. *Id.* at 8:7–10. Location tracking circuitry 114 or transceiver 102 may be placed in a sleep or standby mode to conserve a battery level of battery 118. *Id.* at 8:4–8. Electronic

tracking device 100 may resume GPS signal acquisition using GPS satellites when the acquired receive communication signal level is above the first signal level. *Id.* at 8:10–16.

Accelerometer 130 may also activate if a power level of the receive communication signal (e.g., GPS signal) is insufficient for processing. *Id.* at 10:47–49. In this case, processing unit 104 computes current location coordinates using acceleration measurements. *Id.* at 10:53–54. When the receive communication signal again becomes sufficient for processing, accelerometer 130 is deactivated and location tracking circuitry 114 is activated. *Id.* at 10:58–67. In this case, processing unit 104 resumes the calculation of location coordinates from the receive communication signal. *Id.*

Figure 4 of the '774 patent is reproduced below.

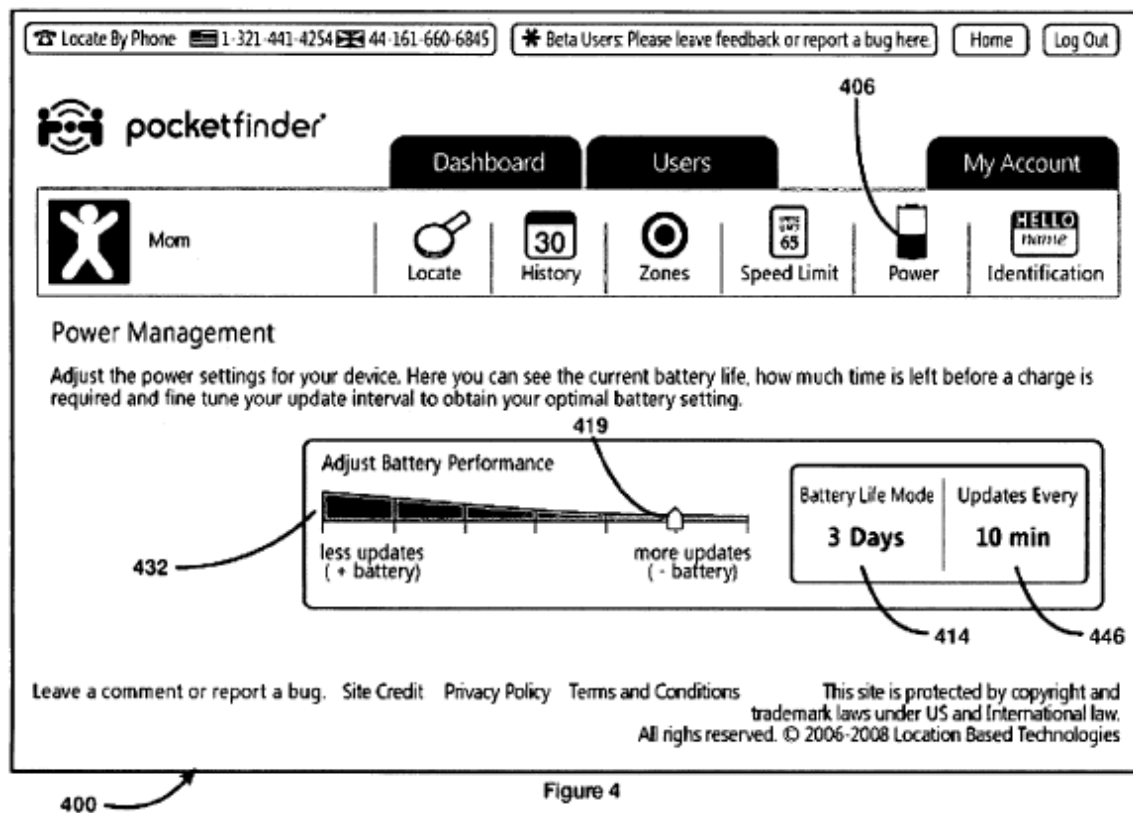


Figure 4, above, depicts screen display 400 of a personal communication device including a user definable adjustable power level monitor for an electronic tracking device. *Id.* at 5:5–7, 11:2–4, 11:12–17. Battery level monitor 116 measures in real-time battery charge level 406 of battery 118 and predicts estimated remaining battery charge life 414 in response to battery charge level 406. *Id.* at 11:22–25, 13:52–58. Battery level monitor 116 also adjusts the power level applied to location tracking circuitry 114 or transceiver 102 responsive to one or more signal levels. *Id.* at 13:52–58.

A local battery power adjustment mechanism generates in substantially real-time an updated set of network communication signaling protocols including, for example, update rate 446 (e.g., refresh rate) of location coordinate packets. *Id.* at 11:31–36. Update rate 446 consists of a request rate of location coordinate packets by the target host and/or a listen rate of location coordinate packets by the portable electronic tracking device. *Id.* at 11:36–41. The local battery power adjustment mechanism includes user-adjustable slider 432⁸ to graphically display in substantially real-time the trade-off relationships between remaining battery charge level 414 and update rate 446 of location coordinate packets. *Id.* at 11:53–57. The user may select a multitude of threshold values via slider 432 to intermittently activate or deactivate location tracking circuitry 114 in order to conserve the power of battery 118. *Id.* at 13:58–67. For example, the user may adjust slider 432 to choose a range of values between a lower update rate 446 (and

⁸ Slider 432 is also called “user adjustable screen icon 432,” “on-line user adjustable cursor display 432,” and “active display 432” in the Specification of the ’774 patent. *See, e.g.*, Ex. 1001, 11:53–57, 13:13–18, 13:58–67.

less battery usage) and a higher update rate 446 (and more battery usage). *Id.* at 11:53–57, Fig. 4. This results in “an appropriate update[d] set of network communication signaling protocols to achieve a desired user defined battery operating environment, e.g., obtain optimal battery life, obtain optimal update rate, [and the] tradeoffs between them.” *Id.* at 11:58–63. This further may result in the local battery power adjustment mechanism communicating a message to activate or deactivate a portion of the transceiver circuitry, processor circuitry, or location tracking circuitry. *Id.* at 11:44–53.

The ’774 patent issued from Application No. 12/419,451 filed on April 7, 2009, which is a continuation-in-part of six applications. Ex. 1001, codes (21), (63).

C. Illustrative Claim

Of the remaining claims of the ’774 patent, claim 8 is independent. Claims 10, 13, and 15 depend from claim 8. Claim 8 is illustrative of the remaining claims and recites:

8. A local charging management device to manage electrical resource capability for an electronic tracking device that is tracked by at least one other tracking device comprising:
 - a battery power level monitor;
 - a charging unit; and
 - an electrical power resource management component to adjust cycle timing of at least one of a request rate of location coordinate packets to a target host and a listen rate of the location coordinate packets responsive to an estimated charge level of the charging unit,
- wherein the battery power level monitor measures a power level of the charging unit and adjusts a power level

applied to location tracking circuitry responsive to one or more signal levels, the power level comprising a multitude of threshold values determined by a user or system administrator to intermittently activate or deactivate the location tracking circuitry to conserve power of the charging unit in response to the estimated charge level of the charging unit.

Ex. 1001, 16:43–61.

D. Remaining Challenged Claims and Grounds

We address below the remaining grounds at issue in this Remand Final Written Decision, which are summarized in the following table (Pet. 6; Dec. on Inst. 29; Paper 42, 17):

Claims Challenged	35 U.S.C. §	References/Basis
8, 10, 13, 15	103(a)	Sakamoto
8, 10, 13, 15	103(a)	Sakamoto, AAPA
8, 10, 13, 15	103(a)	Sakamoto, Hayasaka

II. ANALYSIS

A. Legal Standards

A 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. *See KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007).

The question of obviousness is resolved on the basis of underlying factual determinations, including (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) where in evidence, so-called secondary

considerations.⁹ *See Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). We also recognize that prior art references must be “considered together with the knowledge of one of ordinary skill in the pertinent art.” *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994) (citing *In re Samour*, 571 F.2d 559, 562 (CCPA 1978)).

B. Level of Ordinary Skill in the Art

For the same reasons discussed in our original Final Written Decision, we apply the following level of ordinary skill in the art: A person of ordinary skill in the art (or “POSITA”) would have had a bachelor’s degree in Electrical Engineering, Computer Engineering, Computer Science, or an equivalent degree, with two years of experience in GPS navigation, portable tracking devices, or related technologies. Final Dec. 10–11.

C. Claim Interpretation

In an *inter partes* review, we construe each claim 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), including construing the claim in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.

37 C.F.R. § 42.100(b). Accordingly, our claim construction standard is the same as that of a district court. *See id.* Under the standard applied by district courts, claim terms are generally given their plain and ordinary meaning as would have been understood by a person of ordinary skill in the

⁹ The trial record does not include any evidence of secondary considerations of nonobviousness.

art at the time of the invention and in the context of the entire patent disclosure. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005) (en banc). “There are only two exceptions to this general rule: 1) when a patentee sets out a definition and acts as his own lexicographer, or 2) when the patentee disavows the full scope of a claim term either in the specification or during prosecution.” *Thorner v. Sony Comput. Entm’t Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012).

1. “*Multitude*”

As discussed above, the Federal Circuit held that “[t]he plain and ordinary meaning of multitude in the ’774 patent does not encompass two threshold values.” Paper 42, 11. The court also stated that “multitude does not include two but must include as few as five threshold values.” *Id.* at 13. Thus, based on the court’s holding, a “multitude” cannot be two threshold values. *Id.* at 11, 13. Although the court left open the question of whether a “multitude” encompasses three or four threshold values, we do not need to answer this question to dispose of the remaining claims and grounds. *See, e.g., Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) (“The Board is required to construe ‘only those terms . . . that are in controversy, and only to the extent necessary to resolve the controversy.’” (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

2. “*The power level comprising a multitude of threshold values*”

In briefing on remand, the parties addressed the construction of “multitude of threshold values” in the following limitation from claim 8:

wherein the battery power level monitor measures a power level of the charging unit and adjusts a power level applied to location tracking circuitry responsive to one or more signal levels, the power level comprising a *multitude of threshold values* determined by a user or system administrator to intermittently activate or deactivate the location tracking circuitry to conserve power of the charging unit in response to the estimated charge level of the charging unit.

Ex. 1001, 16:53–61 (emphasis added). In particular, the parties addressed whether—as a matter of claim construction—the “threshold values” in the recited “multitude of threshold values” are limited to battery power level threshold values or whether they may also include signal level threshold values. *See* Paper 43, 3.

Petitioner argues that “any construction of ‘threshold values’ must include both battery power and GPS signal level threshold values.” Pet. Remand Br. 1. Petitioner notes that the ’774 patent discloses an embodiment where a GPS signal level is related to a threshold value. *Id.* (quoting Ex. 1001, 7:55–59). Petitioner explains how the system of the ’774 patent attempts to save battery power by deactivating the GPS when GPS signal levels reach a GPS signal level threshold, i.e., “they are too weak.” *Id.* at 2 (citing Ex. 1001, 3:2–7, 7:55–8:3, 8:7–16, 8:67–9:3). Petitioner further explains that the GPS signal level threshold is used to determine whether to activate or deactivate accelerometer circuitry. *Id.* at 3–4 (citing Ex. 1001, 9:14–16, 10:38–52, Fig. 3). Petitioner contends that “this embodiment would be inoperable if it solely looked at a multitude of battery level thresholds” and “[a] construction of ‘multitude of threshold values’ that excludes GPS signal levels would read out this specific embodiment of the ’774 Patent.” *Id.* at 4–6. Finally, Petitioner notes that “threshold value” appears only two times in the ’774 patent: once with reference to battery

power threshold levels, and another with reference to GPS signal level thresholds. *Id.* at 6–7 (citing Ex. 1001, 7:55–58, 13:58–62).

Patent Owner argues that “[t]he claim language itself . . . shows that the ‘multitude of thresholds’ refers to the power level that is monitored and adjusted by the battery power level monitor.” PO Remand Br. 2. Patent Owner also argues that the specification of the ’774 patent “repeatedly and consistently identifies the claimed power level with battery power level 406.” *Id.* at 2–3 (citing Ex. 1001, 13:52–67). Patent Owner additionally argues that the specification “discloses that battery power level adjustments may be based on user input,” and that “the recited ‘multitude of threshold values’ corresponds to value 419, which is explicitly disclosed as defining a battery power level threshold that can be adjusted to a multitude of values.” *Id.* at 3–4 (citing Ex. 1001, 11:44–63, 13:58–67, Fig. 4). Patent Owner further highlights how the specification never “refers to a GPS signal level as a ‘power level,’ but only as a ‘signal level.’” *Id.* at 4 (citing Ex. 1001, 2:64–65, 7:57–58, 8:10, 8:16, 13:58, 16:56).

In Petitioner’s responsive brief, Petitioner argues that the parties’ dispute is simply whether the GPS signal level embodiment is part of the claims or not. Pet. Remand Resp. 1. According to Petitioner, Patent Owner ignores the GPS signal level embodiment in Figure 3 of the ’774 patent and instead focuses solely on the battery level embodiment of Figure 4. *See id.* at 1–3. Petitioner also argues that the transitional word “comprising” in “the power level comprising a multitude of threshold values” implies that the “‘multitude of threshold values’ may include the power level of a battery but the claim is not limited to only those power levels.” *Id.* at 4–5 (citing *Crystal Semiconductor Corp. v. TriTech Microelectronics Intl’l, Inc.*, 246 F.3d 1336,

1362 (Fed. Cir. 2001)). As such, Petitioner contends that we should read the “broad, plain language used in claim 8” to cover both “the battery level embodiment columns 11-13, as relied upon by [Patent Owner], but also the precise GPS signal embodiment from column 7 through column 10.” *Id.* at 5.

In Patent Owner’s responsive brief, Patent Owner argues that Petitioner “ignores [the] clear claim language” and instead “relies on a single embodiment disclosed in the ’774 Patent that is separate and distinct from the embodiment covered by Claim 8’s ‘multitude of threshold levels.’” PO Remand Resp. 1. According to Patent Owner, “[t]he ’774 Patent discloses two distinct and complimentary embodiments that are each separately encompassed in Claim 8.” *Id.* at 2. Patent Owner also disputes that the ’774 patent discloses a multitude of GPS signal level thresholds because the specification only refers to a singular GPS signal level threshold value. *Id.* at 3 (citing Ex. 1001, 7:55–59). Patent Owner additionally notes that the GPS signal level embodiment of Figure 3 was originally associated with prosecution claim 16, while the magnitude of power levels embodiment of Figure 4 was originally associated with prosecution claim 17. *Id.* at 5; *see also* Ex. 2019, 372 (prosecution claims 16 and 17 as originally filed); PO Remand Br. 3 (discussion about prosecution claim 17).

To decide whether “the power level comprising a multitude of threshold values” includes GPS signal level thresholds, we start with the words of claim 8. Claim 8 recites a “battery power level monitor” that (1) “measures a power level of the charging unit” and (2) “adjusts a power level applied to location tracking circuitry responsive to one or more signal levels.” Claim 8 further recites that “the power level compris[es] a

multitude of threshold values determined by a user or system administrator.” The remainder of claim 8 states the purpose of the “multitude of threshold values,” which is “to intermittently activate or deactivate the location tracking circuitry to conserve power of the charging unit in response to the estimated charge level of the charging unit.” The natural reading of these recitations is that the “power level” associated with the “multitude of threshold values” is the battery power level that is (1) measured by the battery power level monitor and (2) adjusted by the battery power level monitor and applied to location tracking circuitry. We also note that the claim language already incorporates a limitation directed to “signal levels” insofar as the battery power level monitor “adjusts a power level applied to location tracking circuitry responsive to *one or more signal levels*” (emphasis added). As such, the limitation “one or more signal levels” is recited separately from the limitation “the power level comprising a multitude of threshold values.” Given “[t]he general presumption that different terms have different meanings,” *Chicago Bd. Options Exch., Inc. v. Int’l Sec. Exch., LLC*, 677 F.3d 1361, 1369 (Fed. Cir. 2012), we ascribe different meanings to the recited “signal levels” and “power level.”

We next turn to the written description of the ’774 patent. The only reference to a “multitude of threshold values” appears in the following paragraph:

In yet another advantage, the present invention power charging monitor (e.g., battery level monitor 116) measures a power level (e.g., battery power level 406) of power charging unit (e.g., battery 118) and adjusts a power level (e.g., battery power level 406) applied to, for example, location tracking circuitry (e.g., location tracking circuitry 114) or transceiver 102 responsive to one or more signal levels. In contrast to previous manufacturer tracking device power level settings, the

present invention has the capability of power level (e.g., battery power level 406) adjustments include *multitude of threshold values* (see active display 432 of FIG. 4) that is determined by user or system administrator to intermittently activate or deactivate location tracking circuitry (e.g., location tracking circuitry 114) to conserve power of the power charging unit (e.g., battery 118) responsive to estimated charge level (e.g., battery charge level 406).

Ex. 1001, 13:52–67 (emphasis added); *see* Paper 42, 11 (court pointing to Figure 4 and this passage as “[t]he only example of a multitude of threshold values provided in the specification”). Thus, the specification directly links the “multitude of threshold values” with battery power level 406. Ex. 1001, 13:52–67. It also links the “multitude of threshold values” with active display 432 in Figure 4, which is also called “slider 432,” “user adjustable screen icon 432,” “on-line user adjustable cursor display 432.” *See id.* at 11:53–57, 13:13–18, 13:58–67. The specification states that “user adjustable electronic display 432 . . . indicates [the] current level of battery 406 and allows [the] user a capability to adjust power level thereof.” Accordingly, a user may adjust screen cursor value 419 within active display 432 to choose the desired battery power threshold value among the multitude of battery power threshold values. *See id.* at 11:44–67, 13:58–67, 15:17–21, Fig. 4. Both parties acknowledge that this embodiment is within the scope of the recited “multitude of threshold values.” Pet. Remand Br. 6–7; PO Remand Br. 3–4. We agree.

The written description uses the word “threshold value” in only one other passage: “In one embodiment, the accelerometer 130 activates upon one or more designated antenna(s), e.g., antennas 122 a, 122 b, detecting a first signal level, e.g., a low signal level or *threshold value*, as specified by, for instance, a user or system administrator.” Ex. 1001, 7:55–59 (emphasis

added). Petitioner argues that this passage “describes an embodiment that includes GPS signal level as part of the multitude of threshold values.” Pet. Remand Br. 1. Yet the mere use of the word “threshold” in this context does not tie embodiments pertaining to a signal level, such as the one described in Figure 3, to the recitation “the power level comprising a multitude of threshold levels.” Furthermore, as stated above, claim 8 already includes a limitation directed to adjusting the applied power level to the location tracking circuitry “responsive to one or more signal levels,” which is consistent with “the low signal level or threshold value” in this passage from the written description. *See* Ex. 1001, 16:53–61; *see also id.* at 13:52–58 (“[P]ower charging monitor (e.g., battery level monitor 116) measures a power level (e.g., battery power level 406) of power charging unit (e.g., battery 118) and adjusts a power level (e.g., battery power level 406) applied to, for example, location tracking circuitry (e.g., location tracking circuitry 114) or transceiver 102 *responsive to one or more signal levels*” (emphasis added)).

Petitioner also argues that the signal level embodiment of Figure 3 “would be inoperable if it solely looked at a multitude of battery level thresholds.” Pet. Remand Br. 4–5. According to Petitioner, a construction limiting the “multitude of threshold values” to battery power thresholds would read out the Figure 3 embodiment. *Id.* at 5–6; *see also* Pet. Remand Resp. 1–7 (“The dispute is simply whether that embodiment is part of the claims or not.”). We disagree. As stated above, claim 8 already recites that the battery power level monitor adjusts the battery power level “applied to location tracking circuitry *responsive to one or more signal levels*,” which incorporates the notion of responding to a signal level threshold. *See*

Ex. 1001, 13:52–58, 16:53–61. Thus, we do not agree that Patent Owner’s proposed construction of the “multitude of threshold values” reads out a signal level embodiment.¹⁰ The existing “signal levels” recitation in claim 8 also undermines Petitioner’s argument that Patent Owner’s proposed construction would result in a system that “only looked at a multitude of battery threshold values” and could “never deactivate the GPS circuitry.” Pet. Remand Br. 5.

We also have considered Petitioner’s arguments that the word “comprising” in “the power level comprising a multitude of threshold values” “compels a conclusion that the ‘threshold values’ in claim 8 are not limited to only battery levels.” Pet. Remand Resp. 4–5 (citing *Crystal Semiconductor Corp. v. TriTech Microelectronics Int’l, Inc.*, 246 F.3d 1336, 1362 (Fed. Cir. 2001); *Genentech, Inc. v. Chiron Corp.*, 112 F.3d 495, 501 (Fed. Cir. 1997)). We do not agree with the premise of Petitioner’s arguments because this limitation defines what “the power level” comprises, not what “a multitude of threshold values” comprises. Thus, contrary to Petitioner’s arguments, whatever follows the term “comprising” in this limitation must still be a “power level” to be within the scope of the claim. As such, “the power level comprising a multitude of threshold values” refers

¹⁰ We further note that where, as here, “the patent describes multiple embodiments, every claim does not need to cover every embodiment.” *Pacing Techs., LLC v. Garmin Int’l, Inc.*, 778 F.3d 1021, 1026 (Fed. Cir. 2015); *see also AllVoice Computing PLC v. Nuance Commc’ns, Inc.*, 504 F.3d 1236, 1248 (Fed. Cir. 2007) (“[E]very claim need not contain every feature taught in the specification.”). Thus, even if claim 8 did not recite a limitation directed to a signal level threshold, the lack of such a limitation would not support Petitioner’s proposed construction.

to a power level having threshold values, not something else having threshold values. We further note that Petitioner's arguments are based on case law giving "comprising" legal effect as a transitional phrase between the preamble and the body of a claim. In contrast, the word "comprising" here is in the body of the claim, so it has "no special legal effect" and "should be interpreted according to the normal rules of claim interpretation." *Moleculon Rsch. Corp. v. CBS, Inc.*, 793 F.2d 1261, 1272 n.8 (Fed. Cir. 1986). Therefore, consistent with *Moleculon*, we interpret "comprising" here as "'having' but not 'having at least.'" *Id.*

We additionally have considered the prosecution history of the '774 patent. Patent Owner notes (PO Remand Br. 3) that the "multitude of threshold values" limitation initially appeared in prosecution claim 17, which is reproduced below.

17. The apparatus of claim 16, wherein the power level comprises a multitude of threshold value [sic] determined by a user or system administrator to intermittently activate or deactivate the location tracking circuitry to conserve power of the power charging unit in response to the estimated charge level of the power unit.

Ex. 2019, 372. Patent Owner argues that this prosecution claim corresponds to the embodiment in Figure 4 and evidences an association between the threshold values and "turning the location tracking circuitry on and off," such that "the 'multitude of threshold values' can only be battery power level threshold values." PO Remand Br. 3 (citing Ex. 1001, 11:44–67, 12:32–49, 14:1–57, 15:4–21); PO Remand Resp. 5. Patent Owner also notes (PO Remand Resp. 5) that prosecution claim 16, which is reproduced below, corresponds to the signal level embodiment of Figure 3.

16. The apparatus of claim 8, wherein the power charging monitor measures a power level of the power charging unit and adjusts a power level applied to the location tracking circuitry responsive to the signal level.

Ex. 2019, 372. Petitioner does not address the prosecution history. We agree with Patent Owner that the delineation between prosecution claims 16 and 17 provides some support that the “multitude of threshold values” in issued claim 8 relates to battery power levels and not signal levels.¹¹

For these reasons, we determine that the “power level” in “the power level comprising a multitude of threshold values” refers to battery power threshold values. In addition, the words of claim 8, the specification of the ’774 patent, and the prosecution history all distinguish “signal levels” from battery power levels, which evidences that signal level threshold values are not within the scope of “the power level comprising a multitude of threshold values.”

3. *Other Terms*

We determine that no other terms require explicit construction. *See Realtime Data*, 912 F.3d at 1375.

¹¹ Prosecution claim 17 depended from prosecution claim 16, which in turn depended from independent prosecution claim 8. *See* Ex. 2019, 370, 372. The Examiner objected to prosecution claim 17 as being dependent upon a rejected base claim, but indicated that it would be allowable if rewritten in independent form including all of the limitations of the base claim and the intervening claim. *Id.* at 107. Accordingly, the patentees amended prosecution claim 8 to include the limitations of prosecution claims 16 and 17. *Id.* at 93–94, 98–99. The amended prosecution claim 8 issued as claim 8 in the ’774 patent.

D. Obviousness Ground Based on Sakamoto

Petitioner contends the subject matter of claims 8, 10, 13, and 15 would have been obvious over Sakamoto. Pet. 44–55; Pet. Reply 15–19. Patent Owner disputes Petitioner’s contentions. PO Resp. 10–17; PO Sur-reply 11–14.

1. Sakamoto

Sakamoto is a Japanese patent application publication directed to the use of a GPS positioning system that includes a portable terminal and remote server. Ex. 1004, code (57), ¶ 18. Figure 1, reproduced below, is a diagram showing a position information communication terminal.

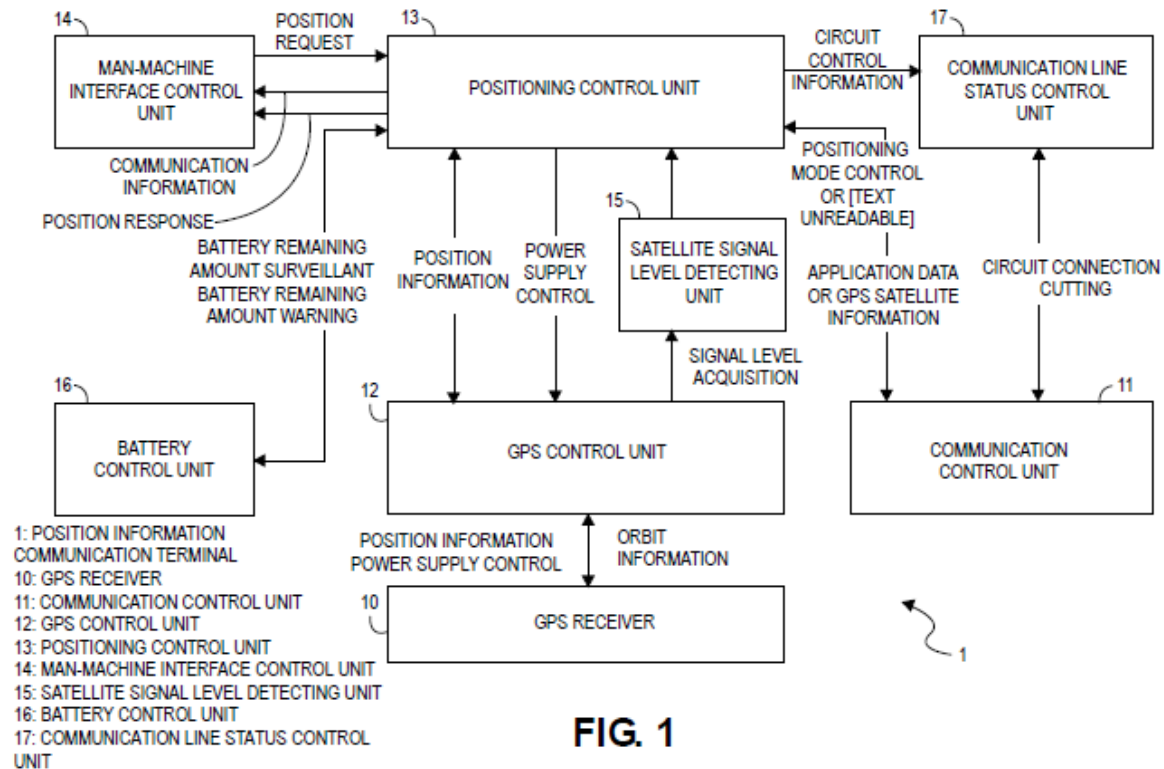


Figure 1, above, depicts position information communication terminal 1, which includes GPS receiver 10, communication control unit 11 for mobile communications, GPS control unit 12, positioning control unit 13, man-

machine interface control unit 14, satellite signal level detection unit 15, battery control unit 16, and communication line status control unit 17. *Id.*

¶ 19. Battery control unit 16 constantly monitors the remaining battery level. *Id.* ¶ 28. Battery control unit 16 provides positioning control unit 13 a remaining battery life warning when the remaining battery amount falls below a preset threshold value. *Id.* ¶ 19.

Satellite signal level detector 15 detects a level of the GPS signal received by GPS receiver 10 via GPS control unit 12. Ex. 1004 ¶ 19. When the signal level value is equal to or higher than a predetermined threshold value, positioning mode control unit 22 initiates a normal sensitivity positioning mode. *Id.* ¶ 38. Normal sensitivity positioning mode is a mode in which the GPS receiver is operated only when necessary. *Id.* ¶¶ 4–5, 19. When the signal level value is equal to or lower than a predetermined threshold value, positioning mode control unit 22 initiates a high sensitivity positioning mode. *Id.* ¶ 38. High sensitivity positioning mode is a mode in which the GPS receiver is operated constantly. *Id.* ¶¶ 4–5, 19. When the signal level value is equal to or lower than a threshold value associated with the inability to perform positioning, positioning mode control unit 22 stops the position search. *Id.* ¶ 38. A user may select among normal sensitivity positioning mode, high sensitivity positioning mode, and the power-off of terminal 1 via man-machine interface control unit 14. *Id.* ¶¶ 26, 28.

If the GPS satellite signal level detected by satellite signal level detection unit 15 is below threshold value K1, then positioning control unit 13 “automatically makes a transition to the high sensitivity positioning mode.” Ex. 1004 ¶ 27. If the GPS satellite signal level detected by satellite signal level detection unit 15 is above a different threshold value K2, then

positioning control unit 13 “automatically makes a transition to the normal sensitivity positioning mode.” *Id.*

Figure 2 of Sakamoto is reproduced below.

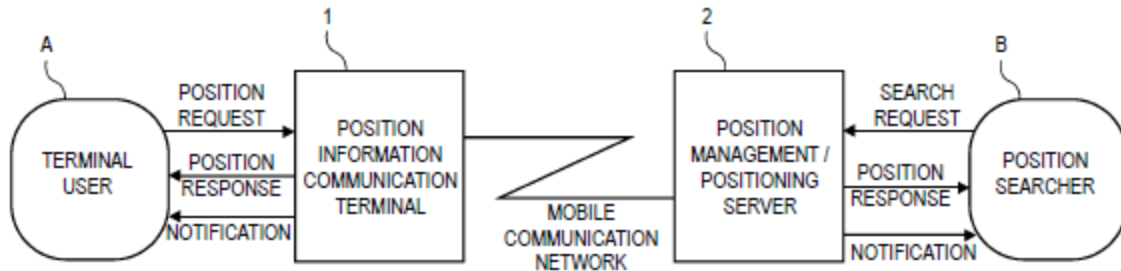


FIG. 2

Figure 2, above, depicts a GPS positioning system with position management/positioning server 2 connected to position information communication terminal 1 by a mobile communication network. Ex. 1004 ¶ 18. Terminal 1 responds to a position request from terminal user A by showing the position of terminal 1 to terminal user A. *Id.* Server 2 responds to a position search request of terminal 1 from position searcher B with a position response. *Id.* Server 2 may also send a position search request message to terminal 1, and terminal 1 responds by sending a search response message including position information to server 2. *See id.* ¶¶ 31–35, Figs. 4, 5.

2. *Claim 8*

a. *Petitioner’s Contentions*

Independent claim 8 recites “[a] local charging management device to manage electrical resource capability for an electronic tracking device that is tracked by at least one other tracking device.” Ex. 1001, 16:43–45. For the “local charging management device,” Petitioner cites Sakamoto’s battery,

battery control unit 16, positioning control unit 13, and GPS control unit 12. Pet. 44. Petitioner maps the “electronic tracking device” to Sakamoto’s GPS receiver 10, communication control unit 11, GPS control unit 12, position control unit 13, man-machine interface control unit 14, satellite signal level detecting unit 15, battery control unit 16 and battery, and communication line status controlling unit 17. *Id.* at 13 (citing Ex. 1004 ¶ 19, Fig. 1), 44–45. For “track[ing] by at least one other tracking device,” Petitioner contends the “electronic tracking device” is tracked by position management server 2. *Id.* at 44–45; *see also id.* at 15–16 (analyzing similar limitation in claim 1).

Claim 8 further recites “a battery power level monitor.” Ex. 1001, 16:46. Petitioner maps this limitation to Sakamoto’s battery control unit 16 and GPS control unit 12. Pet. 22–25, 45–46 (citing Ex. 1004, Fig. 1). According to Petitioner, Sakamoto’s battery control unit 16 “constantly” monitors a remaining battery amount in order to determine when battery power falls below a predetermined threshold. Pet. 22–24 (citing Ex. 1004 ¶¶ 19, 28, 39).

Claim 8 further recites “a charging unit.” Ex. 1001, 16:47. Petitioner cites the battery in Sakamoto’s terminal 1 for teaching the recited “charging unit.” Pet. 16 (citing Ex. 1004 ¶ 19), 46 (citing Ex. 1004 ¶ 47). In particular, Petitioner relies on the following passage from Sakamoto:

The position information communication terminal 1 is, as shown in FIG. 1, composed of. . . a battery control unit 16 that notifies the positioning control unit 13 of a remaining battery amount warning when **the remaining amount value of a battery (not shown) that supplies operating power** falls below a preset threshold value.

Id. at 16 (quoting Ex. 1004 ¶ 19) (emphasis by Petitioner).

Claim 8 further recites “an electrical power resource management component to adjust cycle timing of at least one of a request rate of location coordinate packets to a target host and a listen rate of the location coordinate packets responsive to an estimated charge level of the charging unit.”

Ex. 1001, 16:48–52. According to Petitioner, the ’774 patent states that a local battery adjustment mechanism is one example of an “electrical resource management component.” Pet. 46 (citing Ex. 1001, 13:13–15). As such, Petitioner cites its analysis from claim 1 in which it maps a local battery power adjustment mechanism to Sakamoto’s man-machine interface control unit 14 and positioning control unit 13. Pet. 26–27 (citing Ex. 1004, Fig. 1), 46. Petitioner contends these elements “act in concert to reduce (*i.e.*, ‘adjust’) the battery usage of *Sakamoto*’s terminal.” *Id.* at 27 (citing Ex. 1004 ¶ 46).

Petitioner explains that a user sets a “preset threshold value” using man-machine interface control unit 14 “to specify the battery level below which the terminal will automatically switch from high sensitivity positioning mode to normal sensitivity positioning mode.” *Id.* at 27–28 (citing Ex. 1004 ¶¶ 29, 46), 47. Based on this threshold value, positioning control unit 13 switches between the high sensitivity positioning mode and the normal sensitivity positioning mode by turning on and off the GPS receiver according to the current positioning mode. *Id.* at 28 (citing Ex. 1003 ¶ 87; Ex. 1004 ¶¶ 20, 24), 47. Petitioner further contends that an ordinarily skilled artisan “would have appreciated that switching the positioning mode updates the communication signaling protocol.” *Id.* at 31 (citing Ex. 1003 ¶¶ 89–94), 47 (citing Ex. 1003 ¶¶ 98, 102); *see also id.* at 29–30 (same argument); Pet. Reply 15 (same argument). Petitioner

associates “adjust[ing] cycle timing” of the request rate and/or listen rate with generating such an updated set of communication signaling protocols. Pet. 46–47 (citing Ex. 1003 ¶ 98).

For the recited “listen rate,” Petitioner notes that, after an initial position request, “high-sensitivity positioning mode keeps the GPS continuously powered on, ‘constantly’ updating the position of the terminal,” so an ordinarily skilled artisan would have known the GPS receiver to have “an associated refresh rate of location coordinates (commonly 1Hz).” Pet. 31 (citing Ex. 1003 ¶ 90; Ex. 1004 ¶¶ 20, 25, 31, 36), 46–47 (relying on analysis from claim 1). Petitioner further notes that, in Sakamoto’s normal sensitivity positioning mode, GPS receiver 10 is powered on and off in response to requests at man-machine interface control unit 14, which Petitioner characterizes as regular or irregular. *Id.* at 32–33 (citing Ex. 1003 ¶ 92; Ex. 1004 ¶¶ 24, 34). Petitioner additionally notes that Sakamoto discloses search requests made during a regular “short cycle.” *Id.* at 33 (citing, *inter alia*, Ex. 1004 ¶ 40). Furthermore, Petitioner notes that even when no positioning request is pending, the server may periodically (i.e., at a “cycle set in advance”) send a satellite signal level request message, which “causes the terminal to monitor the satellite signal level for a specified length of time and send a ‘satellite signal level response message’ with signal strength data to the server.” *Id.* at 32 (citing Ex. 1004 ¶ 37). As such, Petitioner contends an ordinarily skilled artisan would have understood that the periodic satellite signal request message cycle is “a minimum value for the listen rate of the GPS receiver in normal sensitivity position.” *Id.* (citing Ex. 1003 ¶ 92). Finally, Petitioner asserts that the

listen rate for GPS signals is zero when the GPS receiver is in power-off mode. *Id.* at 33–34 (citing Ex. 1003 ¶ 94; Ex. 1004 ¶¶ 28, 39, 51).

For the “request rate,” Petitioner contends that search response messages in Sakamoto’s normal and high sensitivity modes “are generated in response to a position search request message and as such may be generated in response to a request by a position searcher or repeatedly in a ‘short cycle.’” Pet. 33 (citing Ex. 1004 ¶¶ 31–35, 40, 53), 46–47 (relying on analysis from claim 1). In light of this, Petitioner contends that an ordinarily skilled artisan “would have understood that the communication signaling protocol associated with normal sensitivity positioning mode has a response rate that may be irregular (based on manual searches) or regular (at a predefined cycle frequency).” *Id.* at 33 (citing Ex. 1003 ¶¶ 91–92).

Petitioner also contends that an ordinarily skilled artisan would have known that the response rate for requests is zero in power-off mode “because GPS signal levels are not monitored and position searching is stopped.” *Id.* at 34 (citing Ex. 1003 ¶ 94; Ex. 1004 ¶ 38). Petitioner provides a chart, reproduced below, summarizing its “request rate” and “listen rate” mappings to Sakamoto’s teachings.

Communication signaling protocol	GPS Listen Rate	Response Rate (to Request Rate of Location Coordinate Packets)
High sensitivity positioning mode	Maximum GPS refresh rate (<i>e.g.</i> , 1Hz)	irregular request rate or regular “short cycle”
Normal sensitivity positioning mode	irregular request rate, regular “short cycle,” or “cycle set in advance”	irregular request rate or regular “short cycle”
Power-off mode	0Hz	0Hz

Id. In this chart from the Petition, Petitioner has listed its contentions regarding the “GPS Listen Rate” and “Response Rate (to Request Rate of Location Coordinate Packets)” for Sakamoto’s high and normal sensitivity modes and power-off mode. *Id.*

Claim 8 further recites

wherein the battery power level monitor measures a power level of the charging unit and adjusts a power level applied to location tracking circuitry responsive to one or more signal levels, the power level comprising a multitude of threshold values determined by a user or system administrator to intermittently activate or deactivate the location tracking circuitry to conserve power of the charging unit in response to the estimated charge level of the charging unit.

Ex. 1001, 16:53–61. Petitioner contends “*Sakamoto* teaches battery control unit 16 measures a power level of the battery.” Pet. 48 (citing Ex. 1003 ¶ 101); *see also id.* at 23–24 (citing Ex. 1004 ¶¶ 28, 39). For “adjust[ing] a power level applied to location tracking circuitry,” Petitioner cites Sakamoto’s teaching of changing the power level applied to GPS receiver 10 depending on positioning mode. *Id.* at 48–49 (citing Ex. 1004 ¶¶ 24, 25). Petitioner contends the adjustment to GPS receiver 10 is “responsive to one or more signal levels” based on Sakamoto’s detection of GPS satellite signal levels and teachings of (1) threshold K1, below which positioning control unit 13 automatically transitions to high sensitivity positioning mode; and (2) threshold K2, above which positioning control unit 13 automatically transitions to normal sensitivity positioning mode. *Id.* at 49–50 (citing Ex. 1004 ¶ 27).

For the recited “multitude of threshold values,” Petitioner initially cited Sakamoto’s teachings of two battery power level thresholds related to (1) the user-defined battery power level threshold below which the mode

switches from high sensitivity positioning mode to normal sensitivity positioning mode; and (2) “a still lower-power mode whereby the GPS receiver is completely shut down.” Pet. 50–51 (citing Ex. 1004 ¶¶ 29, 39, 51). Regarding the “still-lower power mode,” Petitioner contends an ordinarily skilled artisan “would have understood these teachings of *Sakamoto* to indicate a second battery threshold below which this complete GPS power off occurs.” *Id.* at 51 (citing Ex. 1003 ¶ 103).

In its Reply, Petitioner cites two additional thresholds associated with a GPS signal level for teaching the “multitude of threshold values.” Pet. Reply 16. According to Petitioner,

Sakamoto teaches that the power level applied to the GPS receiver can be increased (to set the GPS receiver to high sensitivity positioning mode) when the GPS signal level is below a predetermined threshold K1, or decreased (to set the GPS receiver to normal sensitivity mode) when GPS signal level exceeds “a threshold value K2 different from the threshold value K1.”

Id. at 16–17 (quoting Ex. 1004 ¶ 27) (citing Ex. 1003 ¶ 58). Petitioner explains that “[t]hese GPS signal level thresholds are used as the basis to ‘intermittently activate or deactivate the location tracking circuitry’ for the same reasons discussed in the Petition with respect to the battery level thresholds at least because *Sakamoto* uses the same modes with both sets of thresholds.” *Id.* at 17. Petitioner contends that all of its cited thresholds, including K1 and K2, “are used to transition positioning mode and therefore adjust the cycle timing.” *Id.*

b. Patent Owner's Arguments

Patent Owner argues that “*Sakamoto* does not disclose more than two thresholds of any one type.” PO Sur-reply 13. Patent Owner further argues that it is “improper to combine thresholds unrelated to the power level.” *Id.* As such, Patent Owner concludes that “the combination of *Sakamoto*’s two power level-related thresholds and two signal-related thresholds to achieve four thresholds, as proposed by Petitioner, is insufficient to disclose this limitation.” *Id.* at 14.

c. Analysis

Petitioner cites *Sakamoto*’s two battery power level thresholds (i.e., the battery power thresholds between (1) high and normal sensitivity positioning modes and (2) normal sensitivity positioning mode and turning off power to the GPS receiver) and *Sakamoto*’s two GPS signal level thresholds (i.e., K1 and K2) for teaching “the power level comprising a multitude of threshold values.” Pet. 50–51; Pet. Reply 16–18. As discussed above, however, “the power level comprising a multitude of threshold values” refers to battery power level thresholds. *See supra* § II.C.2. We also determine above that signal level threshold values are not within the scope of “the power level comprising a multitude of threshold values.” *See id.* Accordingly, we are not persuaded that *Sakamoto*’s GPS signal level thresholds K1 and K2 teach the recited power level threshold values. Although Petitioner is correct that “*Sakamoto* uses the same modes with both sets of thresholds” and that both sets of thresholds might ultimately relate to conserving battery power (*see* Pet. Reply 17 (citing Ex. 1003 ¶ 58; Ex. 1004 ¶¶ 27–29)), we are not persuaded that these different types of

thresholds are interchangeable within the scope of “the power level comprising a multitude of threshold values.” This is particularly true given that Petitioner already relies on Sakamoto’s GPS signal level thresholds K1 and K2 for teaching another aspect of claim 8, i.e., “responsive to one or more signal levels.” *See* Pet. 49–50.

For these reasons, Petitioner has only established that Sakamoto teaches two battery power level thresholds within the scope of “the power level comprising a multitude of threshold values.” Because two threshold values are not a “multitude” (*see supra* § II.C.1), we find that Petitioner has not established that Sakamoto teaches “the power level comprising a multitude of threshold values,” as recited in claim 8. Thus, we determine Petitioner has not shown by a preponderance of the evidence that the subject matter of claim 8 would have been obvious over Sakamoto.

3. *Claims 10, 13, and 15*

Claims 10, 13, and 15 each depend from claim 8. Ex. 1001, 17:4–10, 17:23–25, 17:29–33. Petitioner’s analysis for these claims does not cure the deficiencies discussed above with respect to claim 8. *See* Pet. 54–55. Thus, we determine Petitioner has not shown by a preponderance of the evidence that the subject matter of claims 10, 13, and 15 would have been obvious over Sakamoto.

E. *Obviousness Ground Based on Sakamoto and AAPA*

Petitioner contends the subject matter of claims 8, 10, 13, and 15 would have been obvious over the combination of Sakamoto and AAPA. Pet. 60. Petitioner’s further analysis based on AAPA does not cure the

deficiencies discussed above with respect to claims 8, 10, 13, and 15 in the Sakamoto obviousness ground. *See supra* §§ II.D.2–3. Thus, we determine Petitioner has not shown by a preponderance of the evidence that the subject matter of claims 8, 10, 13, and 15 would have been obvious over the combination of Sakamoto and AAPA.

F. Obviousness Ground Based on Sakamoto and Hayasaka

Petitioner contends the subject matter of claims 8, 10, 13, and 15 would have been obvious over the combination of Sakamoto and Hayasaka. Pet. 70–71. Petitioner’s further analysis based on Hayasaka does not cure the deficiencies discussed above with respect to claims 8, 10, 13, and 15 in the Sakamoto obviousness ground. *See supra* §§ II.D.2–3. Thus, we determine Petitioner has not shown by a preponderance of the evidence that the subject matter of claims 8, 10, 13, and 15 would have been obvious over the combination of Sakamoto and Hayasaka.

III. CONCLUSION

Petitioner has not shown, by a preponderance of the evidence, that (1) the subject matter of claims 8, 10, 13, and 15 would have been obvious over Sakamoto; (2) the subject matter of claims 8, 10, 13, and 15 would have been obvious over the combination of Sakamoto and AAPA; or (3) the subject matter of claims 8, 10, 13, and 15 would have been obvious over the combination of Sakamoto and Hayasaka.

In summary:

Claims	35 U.S.C. §	Reference(s)/Basis	Claims Shown Unpatentable	Claims Not shown Unpatentable
8, 10, 13, 15	103(a)	Sakamoto		8, 10, 13, 15
8, 10, 13, 15	103(a)	Sakamoto, AAPA		8, 10, 13, 15
8, 10, 13, 15	103(a)	Sakamoto, Hayasaka		8, 10, 13, 15
Overall Outcome				8, 10, 13, 15

IV. ORDER

Accordingly, it is

ORDERED that claims 8, 10, 13, and 15 of the '774 patent are not unpatentable; and

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

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Patent 8,497,774 B2

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