

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

VUSIONGROUP SA,
Petitioner,

v.

HANSHOW TECHNOLOGY CO. LTD.,
Patent Owner.

IPR2024-00857
Patent 11,540,216 B2

Before BRIAN J. McNAMARA, TERRENCE W. McMILLIN, and
GARTH D. BAER, *Administrative Patent Judges*.

McNAMARA, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

VusionGroup SA (“Petitioner”) filed a petition, Paper 2 (“Petition” or “Pet.”), to institute an *inter partes* review (“IPR”) of claims 1–19 (the “challenged claims”) of U.S. Patent No. 11,540,216 (“the ’216 patent”). 35 U.S.C. § 311. Hanshow Technology Co., Ltd. (“Patent Owner”) timely filed a Preliminary Response, Paper 6 (“Prelim. Resp.”), contending that the Petition should be denied as to all challenged claims. We have jurisdiction under 35 U.S.C. § 314, which provides that an *inter partes* review may not be instituted unless the information presented in the Petition “shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.”

A decision to institute under § 314 may not institute on fewer than all claims challenged in the petition. *SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348, 1359–60 (2018). In addition, per Board practice, if the Board institutes trial, it will institute “on all of the challenged claims and on all grounds of unpatentability asserted for each claim.” *See* 37 C.F.R. § 42.108(a).

Having considered the arguments and the associated evidence presented in the Petition and the Preliminary Response, for the reasons described below, we institute *inter partes* review.

II. REAL PARTIES IN INTEREST

Petitioner identifies itself (VusionGroup SA) and VusionGroup GmbH (f/k/a/ SES-Imagotag GmbH) as its real parties-in-interest. Pet. 86. Patent Owner identifies itself (Hanshow Technology Co., Ltd.) as its real party-in-interest. Paper 4, 1.

III. RELATED MATTERS

The Petition and Patent Owner state that the '216 patent is asserted in the following litigation: *Hanshow Technology Co., Ltd. v. SES-imagotag SA, et al.*, Case No. 2:23-cv-00174 (E.D. Tex.). Pet. 86; Paper 4, 1.

IV. THE '216 PATENT

The '216 patent relates to interactive communications with electronic tag devices. Ex. 1001, 1:16 – 18. Figure 1 of the '216 patent, shown below, is a structural diagram of an interactive electronic tag device communication system, showing a single base station; *Id.* at 3:41–43, 3:47–49; 5:64–6:2.

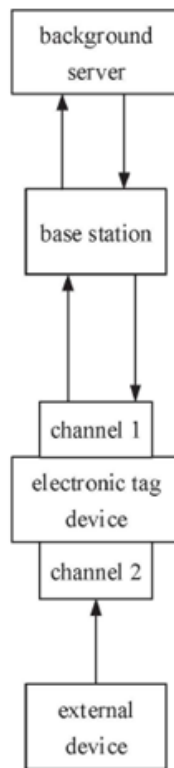


FIG. 1

The external device is configured to communicate with an electronic tag device having a unique tag ID over a second communication path (channel 2, i.e., a wireless communication module, such as magnetic or NFC switch). *See id.* at 4:41–50, 4:55–56. The electronic tag device interacts with a base

station and background server over a first communication path (channel 1, e.g., a 2.4G Radio Frequency (RF) path). *Id.* at 4:31–36.

1. *The '216 Patent's Description of Conventional Systems*

The '216 patent explains that, in conventional practice, an electronic tag device wakes up for a “monitoring period,” typically about 30 seconds, during which the electronic tag monitors for the presence of a communication request. *Id.* at 1:24 – 28. If there is a communication request, the electronic tag device enters a data transmission mode for data reception and executes or stores the instruction it receives. *Id.* at 1:29 – 32. If a base station located between the electronic tag and a background server in the system intends to communicate with an electronic tag device, the tag needs to be awakened for a time period, i.e., a “wake-up duration” of the base station, that is longer than the monitoring period of the electronic tag device, in order to complete the base station’s communication with the electronic tech device. *Id.* at 1:32 – 42. According to the '216 patent, because operators of electronic devices communicating with electronic tags expect a near immediate response, one goal is to reduce conventional monitoring periods; another goal is to reduce power consumption and extend battery life. *See id.* at 1:43–2:3.

2. *The '216 Patent's Description of Its Approach*

The '216 patent attempts to address the tradeoff between responsiveness and power consumption with a system of electronic tags that operate in a “normal monitoring mode” and a “fast monitoring mode” and base stations that operate in a “normal wake-up mode” and a “fast wake-up mode” that cannot be active all the time. *Id.* at 2:7–15, 5:11–13. Using these modes, “customer experience requirements can be met without shortening the monitoring period of all electronic tag devices, without

increasing battery consumption, and without increasing labor costs.” *See id.* at 6:35–47.

By default, the electronic tag device of Figure 1 operates in the normal monitoring mode supported by the first communication path and the base station communicates with the electronic tag device in a normal wake-up mode. *Id.* at 4:51–54. Figure 3 of the ’216 patent, reproduced below, is a diagram of the structure and data interaction of an embodiment with more than one base station. Ex. 1001, 3:47–49; 5:64–6:2.

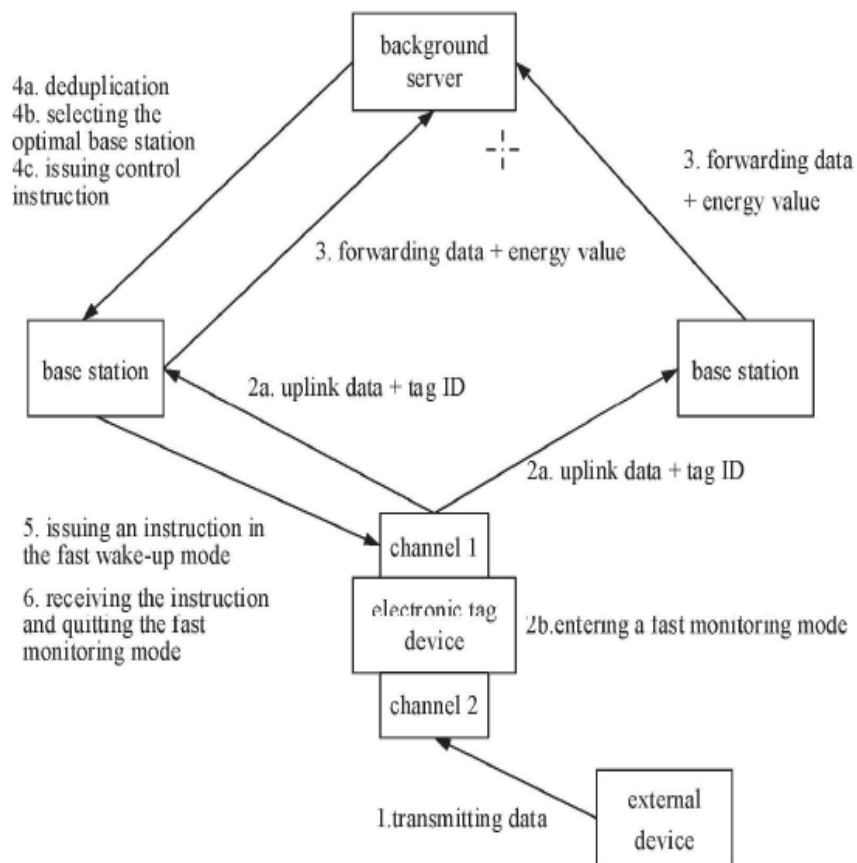


FIG. 3

Ex. 1001, Fig. 3, *see id.* at 5:67–6:47. Referring to the data interaction shown in Figure 3, the ’216 patent discloses that the external device

transmits first data to the electronic tag through channel 2 (step 1), the electronic tag transmits the first data (uplink data) and a tag ID to the base stations (step 2a), the tag then enters the fast monitoring mode (step 2b), and the base stations forward the first data and energy values to the background server (step 3). *Id.* at 6:1–10. The background server evaluates the energy values of the base stations and issues control instructions and second data to an optimal one of the base stations (steps 4a–4c). *Id.* at 6:11–17. The selected optimal base station communicates with the electronic tag device in a fast wake-up mode and issues the instruction (step 5). *Id.* at 6:18–21. The electronic tag receives the instruction through channel 1, completes the fast communication, and returns to the normal monitoring mode (step 6) *Id.* at 6:23–25

V. ILLUSTRATIVE CLAIM

Challenged claims 1, 7, and 14 are independent. Claim 1 is drawn to an interactive tag device; claim 7 is drawn to an interactive electronic tag device communication method; claim 14 is drawn to a non-transitory computer readable storage medium. Claim 1, reproduced below with paragraph designations used in the Petition, is illustrative of the subject matter of the '216 patent.

- [1.0] An interactive electronic tag device communication system, comprising:
 - [1.1] a background server, a base station, an electronic tag device and an external device;
 - [1.2] wherein the electronic tag device comprises two communication paths: a first communication path and a second communication path;
 - [1.2.1] the first communication path supports two monitoring modes: a normal monitoring mode and a fast monitoring mode;

- [1.2.2] and the base station comprises two wake-up modes: a normal wake-up mode and a fast wake-up mode;
- [1.3] the external device is configured to transmit first data to the electronic tag device through the second communication path;
- [1.4] the electronic tag device is configured to receive the first data, transmit the first data to the base station through the first communication path, and enter the fast monitoring mode;
- [1.5] the base station is configured to receive the first data and transmit the first data to the background server;
- [1.6] the background server is configured to generate a control instruction and second data according to the first data, and transmit the control instruction and the second data to the base station;
- [[1.7] the base station is further configured to receive the control instruction and the second data, communicate with the electronic tag device in the fast wake-up mode, and transmit a fast wake-up instruction, the control instruction and the second data to the electronic tag device through the first communication path; and
- 1.8] the electronic tag device is further configured to receive the fast wake-up instruction, the control instruction and the second data, and switch to the normal monitoring mode after completing the communication.

VI. ASSERTED GROUNDS

Petitioner asserts that claims 1–19 would have been unpatentable on the following grounds:

Claim(s) Challenged	35 U.S.C. §	Reference(s)
1, 2, 5–8, 11–15, 18, 19	103	Nagata ¹ , Knowledge of POSITA
1, 2, 5–8, 11–15, 18, 19	103	Nagata, Hashiguchi ²

¹ Certified Translation of Japanese Published Unexamined Patent Application 2017-126872 (Ex. 1005)

² Certified Translation of Japanese Published Unexamined Patent Application 2016-140368 (Ex. 1006)

Claim(s) Challenged	35 U.S.C. §	Reference(s)
3, 4, 9, 10, 16, 17	103	Nagata, Thubert ³ ; Nagata Hashiguchi, Thubert

In support of its challenges, Petitioner cites the Declaration of Dr. Andrew Wolfe (“Ex. 1003, Wolfe Decl.”).

VII. LEVEL OF ORDINARY SKILL IN THE ART

Petitioner describes a person of ordinary skill in the art (“POSITA” or “ordinarily skilled artisan”) as having “a Bachelor’s Degree in electrical or computer engineering, computer science, or a similar field with two or more years of work experience with low-power connected devices.” Pet. 6 (citing Ex. 1003, Wolfe Decl. ¶ 29). Petitioner further states that “[a]dditional education in a relevant field or relevant industry experience may compensate for a deficit in one of the other aspects of the requirements stated above.” *Id.* For purposes of its Preliminary Response, Patent Owner does not dispute Petitioner’s description of an ordinarily skilled artisan. Prelim Resp. 7–8.

The level of ordinary skill in the art usually is evidenced by the references themselves. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001); *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995); *In re Oelrich*, 579 F.2d 86, 91 (CCPA 1978). As Petitioner’s undisputed description of a person of ordinary skill appears consistent with the subject matter of the ’216 patent and the references, we apply Petitioner’s standard for purposes of this Decision.

VIII. 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.

³ U.S. Patent Application Publication No. 2018/0123887 (Ex. 1003)

282(b).” 37 C.F.R. § 42.100(b) (2019). In this context, claim terms “are generally given their ordinary and customary meaning” as understood by a person of ordinary skill in the art in question at the time of the invention. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005) (citations omitted) (en banc). “In determining the meaning of the disputed claim limitation, we look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the prosecution history, if in evidence.” *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 469 F.3d 1005, 1014 (Fed. Cir. 2006) (citing *Phillips*, 415 F.3d at 1312–17). Extrinsic evidence is “less significant than the intrinsic record in determining ‘the legally operative meaning of claim language.’” *Phillips*, 415 F.3d at 1317 (citations omitted). Any special definition for a claim term must be set forth in the specification with reasonable clarity, deliberateness, and precision. *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994). “The Board is required to construe ‘only those terms ... that are in controversy, and only to the extent necessary to resolve the controversy.’” *Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

Neither party has proposed a special definition or explicit construction of any claim term. Pet. 7; Prelim. Resp. 8. As we do not perceive a need to construe any term, we apply the plain and ordinary meaning to the claim language.

IX. ANALYSIS

A. Introduction

“In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed.

Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring inter partes review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)). This burden of persuasion never shifts to Patent Owner. *See Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (discussing the burden of proof in inter partes review).

The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) objective evidence of nonobviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

Additionally, the obviousness inquiry typically requires an analysis of “whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007) (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (requiring “articulated reasoning with some rational underpinning to support the legal conclusion of obviousness”)); *see In re Warsaw Orthopedic, Inc.*, 832 F.3d 1327, 1333 (Fed. Cir. 2016) (citing *DyStar Textilfarben GmbH & Co. Deutschland KG v. C. H. Patrick Co.*, 464 F.3d 1356, 1360 (Fed. Cir. 2006)).

An obviousness analysis “need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.” *KSR*, 550 U.S. at 418; *accord In re Translogic Tech., Inc.*, 504 F.3d 1249, 1259 (Fed. Cir. 2007). Petitioner cannot satisfy its burden of proving obviousness by employing “mere conclusory statements.” *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364,

1380 (Fed. Cir. 2016). Instead, Petitioner must articulate a reason why a person of ordinary skill in the art would have combined the prior art references. *In re NuVasive*, 842 F.3d 1376, 1382 (Fed. Cir. 2016).

A reason to combine or modify the prior art may be found explicitly or implicitly in market forces; design incentives; the “interrelated teachings of multiple patents”; “any need or problem known in the field of endeavor at the time of invention and addressed by the patent”; and the background knowledge, creativity, and common sense of the person of ordinary skill. *Perfect Web Techs., Inc. v. InfoUSA, Inc.*, 587 F.3d 1324, 1328–29 (Fed. Cir. 2009) (quoting *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418–21 (2007)).

In determining whether a claim is obvious in light of the prior art, when in evidence, we consider any relevant objective evidence of non-obviousness. *See Graham*, 383 U.S. at 17. Notwithstanding what the teachings of the prior art would have suggested to one of ordinary skill in the art at the time of the invention, the totality of the evidence submitted, including objective evidence of non-obviousness, may lead to a conclusion that the challenged claims would not have been obvious to one of ordinary skill. *In re Piasecki*, 745 F.2d 1468, 1471–72 (Fed. Cir. 1984). At this stage of the proceeding Patent Owner does not present evidence of such objective considerations

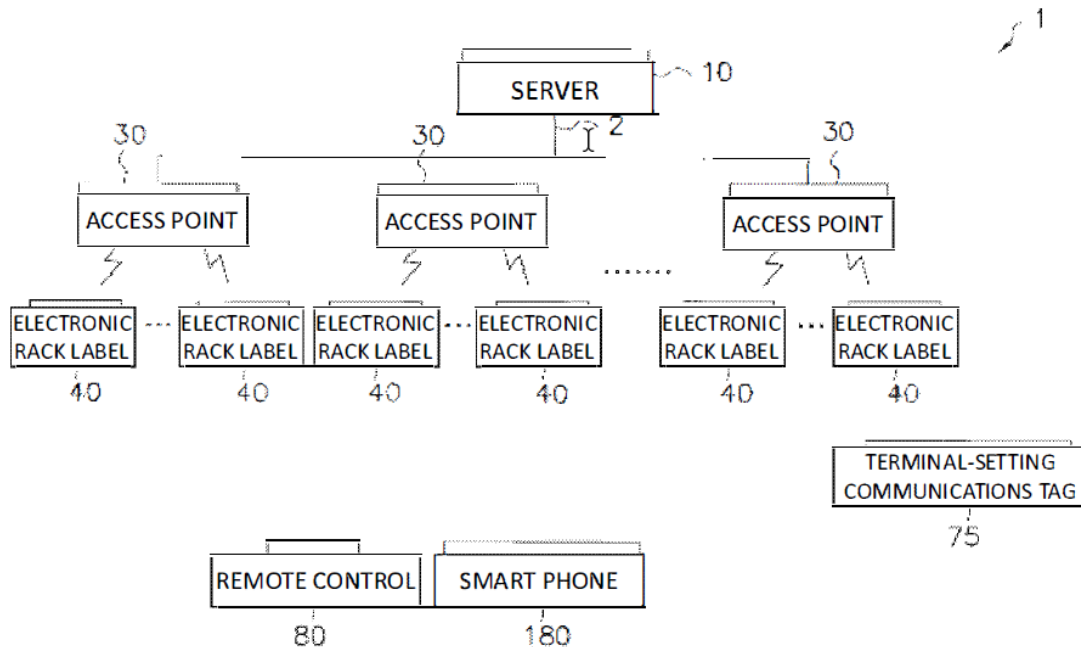
We analyze the asserted grounds of unpatentability in accordance with these principles to determine whether Petitioner has met its burden to establish a reasonable likelihood of success at trial.

B. Petitioner's Contention That Claims 1, 2, 5–8, 11–15, 18, and 19 Would Have Been Obvious Over Nagata and the Knowledge of a Person of Ordinary Skill In The Art

1. *Nagata (Ex. 1005)*

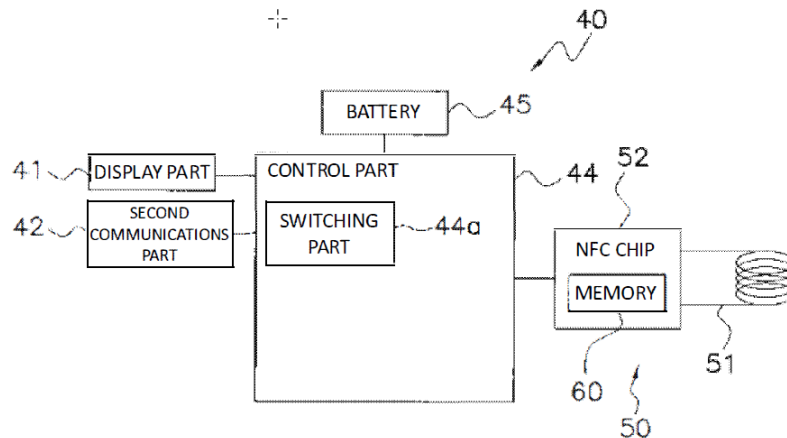
Nagata discloses a wireless display system, e.g., an electronic product display rack. Ex. 1005 ¶¶ 5, 27. An overall schematic diagram of such a system, shown in Figure 1 of Nagata, is reproduced below.

FIG. 1



Ex. 1005, Fig. 1. In Nagata's Figure 1, server 10 stores information concerning a plurality of items. *Id.* ¶ 5; Ex. 1003, Wolfe Decl. ¶ 72. Each battery powered electronic rack label 40, positioned to correspond to a product, is an example of a wireless display device. *Id.* ¶¶ 28–29. A wireless display device 40 is shown in Figure 5, reproduced below.

FIG. 5



Ex. 1005, Fig. 5. Electronic rack label 40, powered by battery 45, has display part 41, and first communications part 50 that uses near field communications (loop antenna 51 and NFC chip 52) to receive instruction information from remote control 80 or smart phone 180. *Id.* ¶¶ 51–60. Electronic rack label 40 stores that information in memory 60 and alerts control part 44 that instruction information has been received; at other times, first communication part 50 can transmit product related information stored in memory 60 to smart phone 80 or remote control 180. *Id.* ¶¶ 51–55, 57–58, 60, 67, 80. The instruction information received from remote control 80 (or smart phone 180) includes, e.g., display update information for the label, and communication on-off instructions for second communications part 42. *Id.* ¶¶ 57, 80.

Control part 44 controls second communications part 42 so that the instruction information received from remote control 80 or smart phone 180 is transmitted to server 10 via corresponding access point 30. *Id.* ¶¶ 61–66, 79, 115–116. Switching part 44a of control part 44 switches operation of second communications part 42. *Id.* ¶¶ 77, 80.

Second communications part 42 has three operational states: an awake state, a sleep state, and a stopped state. Ex. 1005 ¶ 81. Switching part 44a uses a switching device to provide battery power to second communications part 42 in the awake state, allowing communication with access point 30; in the sleep and stopped states, second communication part 42 does not communicate with access point 30. *Id.*

When button 81 on remote control 80 is pushed, near field communication with the remote control 80 is initiated. Ex. 1005 ¶ 115. Switching part 44a of label 40 switches the operation of second communications part 42 to the awake state for a prescribed interval, e.g., 30 seconds, during which second communication part 42 transmits the information to server 10. *Id.* ¶¶ 116–117.

Communications part 42 also automatically switches from the sleep state to the awake state after a prescribed time period has elapsed, e.g., switching part 44 repeatedly switches the operational state from sleep to awake for 1 second every minute. *Id.* ¶¶ 82–83. To report the presence or absence of server information to labels 40, access points 30, mounted, e.g., on the ceiling of a store, transmit a beacon timed to trigger second communications part 42 to enter the awake state. Ex. 1005 ¶ 33. When the beacon reports to the label that information is to be transmitted, the label maintains communication part 42 in the awake state for a prescribed interval, e.g., 30 seconds, to receive the information before returning to the sleep state; when the beacon reports that information will not be transmitted, communication part 42 switches back to the sleep state to conserve battery power. *Id.* ¶¶ 33–34, 83, 116, 124.

If first communications part 50 receives a communication-OFF instruction, switching part 44a switches operation of second communications

part 42 to the stopped state. Ex. 1005 ¶ 84. In the stopped state, second communications part 42 remains stopped until a communication-ON instruction is transmitted to first communications part 50, i.e., from remote control 80 or smart phone 180. *Id.*

2. *Claim 1*

a) *Limitations 1.0 and 1.1*

Petitioner designates the preamble of claim 1, which recites “[a]n interactive electronic tag device,” as limitation 1.0. Pet. vi. Petitioner designates as limitation 1.1, the recitation that the electronic tag device comprises “a background server, a base station, an electronic tag device[,] and an external device.” *Id.* Petitioner cites Nagata’s Figure 1 and its corresponding description as disclosing a wireless display system 1, i.e., an interactive tag device communication system, that performs communications between server 10 (the claimed background server), portable terminal, i.e., remoted control 80 or smart phone 180 (the claimed external device), electronic rack labels 40 (the claimed electronic devices), and access point 30 (the claimed base stations). *See* Pet. 13–14. Patent Owner does not explicitly dispute Petitioner’s contentions concerning limitations 1.0 and 1.1. *See* Prelim. Resp. We determine that, for purposes of institution, Petitioner demonstrates that Nagata would have disclosed or suggested limitations 1.0 and 1.1 to a person of ordinary skill.

b) *Limitations 1.2 and 1.2.1*

Petitioner designates as limitation 1.2 the recitation “the electronic tag device comprises two communication paths: a first communication path and a second communication path.” Pet. vi. Petitioner cites Nagata as disclosing an electronic label having two distinct communication paths, one path being between first communications part 50 and remote control 80 (or smart phone

a80) via NFC chip 52, and another between second communications part 42 and server 10 via access point 30 using radio-wave type wireless communication. *Id.* at 19–22 (citing Ex. 1005 ¶¶ 51–66, Fig. 3, 5).

Petitioner designates as limitation 1.2.1 the recitation “the first communication path supports two monitoring modes: a normal monitoring mode and a fast monitoring mode.” Pet. vi. Petitioner cites Nagata as disclosing two modes in which the second communications part communicates with access point 30 based on the interval at which the label automatically switches between the low power sleep state and the high power awake state and the duration of the awake state. *Id.* at 22. In a first monitoring mode the electronic label’s second communications part is activated from its sleep mode, i.e., placed in the awake mode, for 1 second every minute, and (ii) in a second monitoring mode the second communication part remains in a prolonged active state, e.g., 30 seconds, following communication from the remote control or smart phone. *Id.* at 22–24 (citing Ex. 1005, ¶¶ 28–29, 33, 80–83, 113–116; Ex. 1003, Wolfe Decl. ¶¶ 103–107), *see also* Ex. 1003 ¶¶ 117–118, Fig. 8. Petitioner notes that the second active state accommodates “faster communications that avoid the delay of waiting for the next interval to start.” *Id.* at 23 (citing Ex. 1005 ¶¶ 29, 83; Ex. 1003, Wolfe Decl. ¶ 104).

Petitioner emphasizes that the ’216 patent explains the claimed electronic tag may have a monitoring period and wake up duration that can be changed based on the speed of communication with the base station, such that faster communication can be achieved by shortening the monitoring period or lengthening the wake-up duration. *Id.* at 23–24 (citing Ex. 1001, 1:23–65; Ex. 1003, Wolfe Decl. ¶ 105). According to Petitioner, an ordinarily skilled artisan would have recognized Nagata’s monitoring mode

with a longer prescribed time interval and shorter awake time as the claimed normal monitoring mode having lower power consumption and Nagata's monitoring mode with a longer awake time as the claimed fast monitoring mode consuming more power. *Id.* at 24 (citing Ex. 1003, Wolfe Decl. ¶ 106).

Patent Owner does not explicitly contest Petitioner's arguments concerning limitations 1.2 and 1.2.1. We determine that, for purposes of institution, Petitioner demonstrates that Nagata would have disclosed or limitations 1.2 and 1.2.1 to a person of ordinary skill.

c) Limitations 1.2.2, 1.7, and 1.8

As the parties' arguments concerning limitations 1.2.2, 1.7, and 1.8 are related, we address these limitations together below.

(1) Limitation 1.2.2

Petitioner designates as limitation 1.2.2 the recitation "the base station comprises two wake-up modes: a normal wake-up mode and a fast wake-up mode." Pet. vi. Petitioner notes that Nagata's access points transmit beacons indicating the presence or absence of information to the labels at prescribed time intervals matching those of the label's mode. *Id.* at 25 (citing Ex 1005, ¶¶ 117–121). Emphasizing that Nagata's access points can communicate with an electronic label only when the label is in the active or awake state, Petitioner contends that the access points in Nagata's system have modes corresponding to the labels' modes. *Id.* at 24–25 (citing Ex. 1005, ¶¶ 5, 29, 31, 33; Ex. 1003, Wolfe Decl. ¶ 108).

Petitioner further notes Nagata's disclosure that communication between access points and second communications part 42 of the electronic labels are radio-wave wireless type communications. *Id.* at 24–25, 28. According to Petitioner, an ordinarily skilled artisan would have known to

implement such communications with low energy Bluetooth devices communicating over the unlicensed 2.4GHz radio frequency band or using well known standards, e.g., IEEE 802.15.4 and/or ZigBee, and that such networks offer incremental power management to conserve battery life when both communicating devices using the channel support that feature. *Id.* at 28 (citing Ex. 1003, Wolfe Decl. ¶¶ 112–113). Petitioner argues that, with this knowledge, an ordinarily skilled artisan would therefore have known to operate each access point in a short awake state at prescribed time intervals (the claimed normal wake-up mode) and for a longer awake state (the claimed fast wake-up mode) when communicating with the label. *Id.* at 28–29 (citing Ex. 1003, Wolfe Decl. ¶ 114).

Patent Owner contends Petitioner has not demonstrated that Nagata teaches the base stations having a fast wake-up mode and normal wake-up mode as recited in limitation 1.2.2. Prelim. Resp. 9. According to Patent Owner, Petitioner has not shown Nagata’s access points operate in anything other than a single mode transmitting at a prescribed time interval. *Id.* at 10–11. Patent Owner argues that, as intermediate relay points communicating between server 10 and electronic rack labels 40, Nagata’s access points 30 transmit at one pre-set prescribed interval and that there is no change in system-wide timing. Prelim. Resp. 12. Patent Owner acknowledges Petitioner’s arguments that Nagata teaches entering, at prescribed times, a short awake state (as a normal awake mode) and a longer awake state (as a fast awake mode) when communicating with the label, but contends that these features have nothing to do with system timing. *Id.* at 12. Patent Owner adds that Nagata precludes system wide timing because at any given time one tag could be operating in the fast mode receiving instructions from

an access point and another tag could be operating in the normal mode, not receiving instructions from an access point. *Id.* at 13.

Patent Owner identifies no limitation in claim 1 excluding a base station that enters the fast-awake mode at prescribed times, as taught by Nagata. Claim 1 merely recites a base station with a normal wake-up mode and fast wake-up mode (Ex. 1001, 7:42–44), that receives a control instruction and second data (generated by the server) (*id.* at 7:54–59), communicates with the electronic tag in the fast wake-up mode (*id.* at 7:59–60), and transmits to the electronic tag a fast wake-up instruction and other information (the control instruction and data) (*id.* at 7:60–63). The claim language does not include limitations that define when the base station must communicate with the electronic tag device.

The description in the '216 patent Specification is no more restrictive than the claims. *See* Ex. 1001, 4:21–26, 5:3–10, 5:47–52, 6:18–21 (all describing a system in which the base station receives the control instruction from the server and communicates with the electronic tag in a fast wake-up mode, without further describing timing that excludes a base station entering fast wake-up mode at prescribed times). Instead, the claims and the Specification characterize the fast-awake mode as one in which the base station transmits instructions and data to the electronic device; the claims and the Specification do not exclude a system in which the base station transmits instructions and data to the electronic tag at prescribed times.

Having considered the arguments and evidence currently of record, we determine that, for purposes of institution, Petitioner has demonstrated Nagata would have disclosed the features recited in limitation 1.2.2 to a person of ordinary skill.

(2) *Limitation 1.7*

Petitioner designates as limitation 1.7 the recitation “the base station is further configured to receive the control instruction and the second data, communicate with the electronic tag device in the fast wake-up mode, and transmit a fast wake-up instruction, the control instruction and the second data to the electronic tag device through the first communication path.” Pet. vi. Petitioner cites Nagata’s disclosure of transmitting a timed beacon signal indicating the presence or absence of a subsequent data communication as disclosing limitation 1.7. *Id.* at 38. According to Petitioner, an ordinarily skilled artisan would have understood that Nagata transmits the claimed fast wake-up instruction because, when Nagata’s access point has information to transfer to the tag, the access point transmits an information present beacon prompting the label to enter and remain in the active transmission state (the awake state) for a period to ensure reception of the server command. *Id.* at 39–40. Petitioner further argues that Nagata also discloses the access point transmitting an information absent beacon when there is no command from the server, prompting the label to quickly exit the awake state (fast-monitoring mode) and return to its more power conserving monitoring mode. *Id.*

Referencing the flow chart in Nagata’s Figure 8, Patent Owner contends that Petitioner has not demonstrated Nagata discloses a fast wake-up instruction as an integral part of the communication sequence. Prelim. Resp. 15–16. Noting that an access point does not immediately forward the command to the electronic label, but waits until a prescribed time to indicate the presence of information to be forwarded to a label, Patent Owner argues that Nagata’s beacon signals are not tied to any particular message from the server. *Id.* at 15–16. According to Patent

Owner, the artificial delay introduced by waiting for the next prescribed time slot to send an information present beacon before transmitting server provided information to the label defeats the responsiveness goals of the '216 patent. *Id.* at 17–18.

Referencing the communication sequence described in paragraphs 114–124 of Nagata, Patent Owner argues that “in the communication sequence described in [0114]–[0124], the access point 30, upon receiving the command from the server, can be certain that the electronic rack label 40 is in the awake state and ready for receiving the transmission, thus there is no need for the access point 30 to send any beacon signal to the electronic rack label 40.” Prelim. Resp. 18. Referencing Figure 8, Patent Owner also argues that Steps S6 and S7 indicate that an ordinarily skilled artisan “would understand that Ngata’s access point 30 will send the command to the electronic rack label 40 *without* preceding or succeeding it with a beacon signal.” Prelim. Resp. 19. Thus, according to Patent Owner Nagata does not teach the claimed fast mode instruction signal because Nagata does not actually teach a beacon signal. Prelim. Resp. 18–19 (stating “Nagata describes the transmission sequence, without leaving any space for the beacon signal.”).

Patent Owner’s arguments do not rebut Petitioner’s contentions. Nagata discloses that beacon signals occur at specific times and that each beacon signal indicates whether or not that beacon signal will be followed by information. Ex. 1005 ¶¶ 33–34. Nagata discloses that the electronic labels periodically enter an awake state and that the access points transmit beacon signals to the electronic labels at the times they enter the awake state. *Id.* ¶ 33 (“each of the access points 30 transmits at a prescribed-time interval a signal called a beacon timed to when the operation state of the second

communications parts 42 of the electronic rack labels 40 becomes the awake state.”); *see also id.* ¶ 81 (“in the sleep state or the stopped state, . . . second communications part 42 cannot communicate with the corresponding access point 30.”). Switch 44a in Nagata repetitively switches the second communications part 42 to the awake state once every minute for 1 second. *Id.* ¶ 83. If the access point transmits a beacon indicating no information is to follow, the label’s awake state ends in 1 second; if the beacon indicates more information is to follow, the label remains in the awake state for 30 seconds, i.e., a time that elapses before the next awake period. In this circumstance, switching part 44a may also be configured to maintain the awake state until second communication part 42 receives a storage and display command. *Id.* ¶¶ 116, 128. Thus, in the case where more information is to follow, Nagata’s information beacon and subsequent data provide the fast wake-up signal recited in limitation 1.7.

Having considered the arguments and evidence currently of record, we determine that, for purposes of institution, Petitioner has demonstrated Nagata would have disclosed the features recited in limitation 1.7 to a person of ordinary skill.

(3) *Limitation 1.8*

As designated by Petitioner, limitation 1.8 recites “the electronic tag device is further configured to receive the fast wake-up instruction, the control instruction and the second data, and switch to the normal monitoring mode after completing the communication. Pet. vi–vii. Petitioner cites Nagata as disclosing that upon receiving a beacon indicating more information is coming, the electronic label remains in the awake mode for 30 seconds or until it receives the command. *Id.* at 41 (citing Ex. 1005 ¶¶ 116, 128). Petitioner states that an ordinarily skilled artisan would have

understood that afterwards, the label returns to its normal state (the claimed normal monitoring mode). *Id.*

Patent Owner argues that Nagata does not disclose this limitation for the same reason it does not disclose limitation 1.7, i.e., Nagata's reversion back to a normal state is not tied to the completion of any communications. Prelim. Resp. 21–22. As to limitation 1.8, Patent Owner's arguments do not rebut Petitioner's contentions for the same reasons they do not rebut Petitioner's arguments concerning limitation 1.7. Having considered the arguments and evidence currently of record, we determine that, for purposes of institution, Petitioner has demonstrated Nagata would have disclosed the features recited in limitation 1.8 to a person of ordinary skill.

d) Limitations 1.3–1.6

As designated by Petitioner, limitation 1.3 recites “the external device is configured to transmit first data to the electronic tag device through the second communication path.” Pet. vi. Petitioner cites Nagata as disclosing its remote control or smart phone (the claimed external device) transmits an instruction (the claimed first data) to the label (the claimed electronic tag) through NFC transmission) to the first communications part (the claimed second communication path). *Id.* at 30 (citing Ex. 1005, Figs. 1, 8, 9, ¶¶ 38, 44, 52, 114–115, 125–127; Ex. 1003, Wolfe Decl. ¶¶ 115–116).

As designated by Petitioner, limitation 1.4 recites “the electronic tag device is configured to receive the first data, transmit the first data to the base station through the first communication path, and enter the fast monitoring mode.” Pet. vi. As teaching this limitation, Petitioner cites Ngata's disclosure that the label transmits the instruction it receives from the remote control or smart phone to the servers via an access point and maintains an active state for a prolonged period (the fast monitoring mode

discussed in Section IX.B.2.b herein), e.g., for 30 seconds or until a command is received back from the server. *Id.* at 31–32 (citing Ex. 1005 ¶¶ 79–80, 116–117, 128–129).

As designated by Petitioner, limitation 1.5 recites “the base station is configured to receive the first data and transmit the first data to the background server.” Pet. vi. As evidence that Nagata teaches this limitation, Petitioner cites Nagata’s disclosure of access point 30 receiving an instruction transmitted to it by an electronic label and relaying that instruction to the server, which does not communicate directly with the label. *Id.* at 33–34 (citing Ex. 1005, ¶¶ 117–118, 128–129, Fig. 8).

As designated by Petitioner limitation 1.6 recites “the background server is configured to generate a control instruction and second data according to the first data, and transmit the control instruction and the second data to the base station.” As evidence Nagata teaches this limitation, Petitioner cites Nagata’s disclosure that, responsive to receiving first data, the server references a product master table, generates a command and image data, and sends the command and image data to the access point for transmission to the respective electronic label. *Id.* at 35–37 (citing Ex. 1005, ¶¶ 119–121, 131–132, Fig. 8).

The Patent Owner Preliminary Response does not directly address limitations 1.3–1.6. Having considered the evidence and arguments of record, for purposes of institution, we determine that Petitioner has demonstrated Nagata would have disclosed or suggested these limitations to an ordinarily skilled artisan.

e) Claim 1 Conclusion

Having considered the evidence and arguments currently of record, for purposes of institution, we determine that Petitioner has demonstrated

Nagata would have disclosed or suggested all the elements of claim 1 to a person of ordinary skill in the art.

3. *Independent Claims 7 and 14*

Petitioner notes that independent claim 7 is a method claim reciting limitations that are substantially the same as those recited in independent claim 1. Pet. 41–42. For the same reasons as those discussed above with respect to claim 1, we determine that Petitioner has demonstrated Nagata would have disclosed or suggested all the limitations of claim 7 to an ordinarily skilled artisan.

Similarly, Petitioner notes that independent claim 14, drawn to “[a] non-transitory computer-readable storage medium storing therein a computer program for executing an interactive electronic tag device communication method,” recites limitations that are substantially the same as those recited in independent claim 1. Pet. 42–43. Petitioner adds that, to the extent this claim requires a base station that includes the storage medium, an ordinarily skilled artisan would have had reason to include such a program in memory in Nagata’s access points and would have had a corresponding reasonable expectation of success because Nagata’s access point performs synchronized communication with other devices implementing programs or software performing similar steps. *Id.* at 43. For the same reasons as those discussed above with respect to claim 1, we determine that, for purposes of institution, Petitioner has demonstrated Nagata would have disclosed or suggested all the limitations of claim 14 to an ordinarily skilled artisan.

4. *Claims 2, 8, and 15*

Claim 2 depends from claim 1 and recites that the electronic tag device is configured to attach an ID of the device to the first data when transmitting the first data to the base station. Ex. 1001, 8:1–5. Claims 8 and

15 depend from claims 7 and 14, respectively, and taken in context, recite limitations that correspond to those of claim 2. *Id.* 9:1–7, 10:18–25. As evidence that Nagata discloses this limitation, Petitioner cites Nagata’s disclosure of affixing an apparatus ID to the instruction transmitted to server 10. Pet. 46 (citing Ex. 1005, ¶¶ 75, 117, 129). Patent Owner does not respond directly to Petitioner’s arguments concerning these claims and we determine that, for purposes of institution, Petitioner has demonstrated that Nagata would have disclosed or suggested these limitations to a person of ordinary skill.

5. *Claims 5, 11, and 18*

Claim 5 depends from claim 1 and recites “the electronic tag device is further configured to switch to the normal monitoring mode when the fast wake-up instruction transmitted by the base station is not received within a preset time range.” Ex. 1001, 8:23–27. Claims 11 and 18 depend from claims 7 and 14, respectively, and taken in context, recite limitations that correspond to those of claim 5. *Id.* at 9:22–26, 10:40–45. As evidence that Nagata discloses this limitation, Petitioner cites Nagata’s disclosure that when a beacon signal indicates no data is to be transmitted, the label does not extend its awake time and reverts to a normal mode (i.e., the claimed normal monitoring mode) in which the label is activated for one second every minute. Pet. 47 – 48 (citing Ex. 1005 ¶¶ 83, 116, 128; Ex. 1003, Wolfe Decl. ¶ 147). Patent Owner does not respond directly to Petitioner’s arguments concerning these claims and we determine that, for purposes of institution, Petitioner has demonstrated that Nagata would have disclosed or suggested these limitations to a person of ordinary skill.

6. *Claim 6, 12, and 19*

Claim 6 depends from claim 1 and recites “the electronic tag device is further configured to switch to the normal monitoring mode when the fast wake-up instruction is received but the control instruction and the second data are not received within a preset time range.” Ex. 1001, 8:28–33. Claims 12 and 19 depend from claims 7 and 14, respectively, and taken in context, recite limitations that correspond to those of claim 6. *Id.* at 9:27–32, 10:47–52. As evidence that Nagata teaches this limitation, Petitioner cites Nagata’s disclosure that the label reverts to the sleep state after a elapsed period of time, e.g., 30 seconds, unless the labels switch into an awake state conditioned upon receipt of a server command. Pet. 49–50 (citing Ex. 1005 ¶¶ 33, 34, 116, 138; Ex. 1003, Wolfe Decl. ¶ 152). Patent Owner does not respond directly to Petitioner’s arguments concerning these claims and we determine that, for purposes of institution, Petitioner has demonstrated that Nagata would have disclosed or suggested these limitations to a person of ordinary skill.

7. *Claim 13*

Claim 13 recites “[a] computer device comprising a memory, a processor and a computer program stored on the memory and executable by the processor, wherein the processor implements, when executing the computer program, the method according to claim 7.” Ex. 1001, 9:33–37. Petitioner notes that limitations of claim 13 are substantially similar to the limitation of claims 1, 7, and 14 and that Nagata discloses three processor components that executes stored instructions to carry out the claimed steps. Pet. 51 (citing Ex. 1005 ¶¶ 37, 45, 74–76; Ex. 1003, Wolfe Decl. ¶ 155). Patent Owner does not respond directly to Petitioner’s arguments concerning this claim and we determine that, for purposes of institution, Petitioner has

demonstrated that Nagata would have disclosed or suggested these limitations to a person of ordinary skill.

C. Petitioner's Contention That Claims 1, 2, 5–8, 11–15, 18, and 19 Are Obvious Over Nagata In View of Hashiguchi

1. *Hashiguchi (Ex. 1006)*

Similar to the system disclosed by Nagata, Hashiguchi discloses an electronic rack system having a server, access points, and wireless display devices (electronic labels) disposed at locations to display information corresponding to products located at those locations. *See generally* Ex. 1006. The wireless devices (electronic labels 40) are configured to alternate between an awake state, in which the device can receive item information from a server storing the information, and a sleep state in which the device cannot receive item information and electric power consumption is low. Ex. 1006 ¶¶ 5, 8. In response to a sensor's detection of light, a control part in the tag switches the control mode to a first mode, where the time ratio of the awake state is a prescribed ratio, or a second mode where the time ratio of the awake state is less than that of the first mode., thereby reducing electric power consumption. *Id.* ¶ 8.

2. *Analysis*

As to claim 1, Petitioner cites Hashiguchi in combination with Nagata as disclosing features recited in limitations 1.2.1, 1.2.2, 1.4, 1.7, and 1.8. Pet. 55–63. Petitioner notes that Hashiguchi discloses an electronic label that operates in two modes: (i) an energy saving mode (“normal command transmission mode”), in which the electronic label awakens at comparatively long intervals of time and communicates at a normal rate for a short duration (e.g. 150 msec every 20 sec) and (ii) an active mode in which the electronic

label communicates for the same duration, but awakes at comparatively short intervals of time and communicates at a rapid interval (e.g., 150 msec every 4 sec). *Id.* at 55 (citing Ex. 1006 ¶¶ 70, 127–128, 138–139; Ex. 1003, Wolfe Decl. ¶ 158). Petitioner further notes that, although both Nagata and Hashiguchi transmit beacon signals synchronized to the awake modes of the labels to indicate the presence of information from an access point at scheduled, repetitive times, Nagata and Hashiguchi operate a little differently. *Id.* at 56. In particular, Nagata transmits a beacon signal synchronized to the electronic label wake-up time once every 60 seconds and varies the duration of the label’s awake mode (e.g., 30 seconds when the beacon indicates information to be transmitted is present); but Hashiguchi transmits a beacon signal synchronized with the electronic label’s awake time ratio, communicating beacons that correspond to the wake-up frequency, where the label listens for information for 150 msec in either a fast command mode (every 4 seconds or 15 times per minute) or a normal command mode (every 20 seconds or 3 times per minute). *Id.* at 56–57, 59–60. Petitioner emphasizes that this feature allows Hashiguchi to improve its responsiveness, while reducing battery power drain, providing a reason for an ordinarily skilled artisan to combine the teachings of the references. *Id.* at 56–58.

Noting that, like Nagata’s beacon signals, Hashiguchi’s beacon signals are sent at synchronized and prescribed time intervals in a manner that is indistinguishable from Nagata, Patent Owner argues that Petitioner fails to cure the defects of Nagata concerning the claimed fast wake-up instruction. Prelim. Resp. 23–24.

As discussed above, the claim limitations do not exclude synchronous systems that transmit beacon signals or enter the fast and normal wake-up

modes at prescribed times. For the same reasons as those discussed above in our analysis of Nagata (*see* Section IX.B herein), we determine that Petitioner has demonstrated that a person of ordinary skill would have had reason to combine the teachings of Nagata and Hashiguchi and that their combined teachings would have disclosed or suggested all the limitations of the independent claims 1, 7, and 14 and their corresponding dependent claims to such an ordinarily skilled artisan.

D. Petitioner's Contention That Claims 3, 4, 9, 10, 16, 17 Are Obvious Over Nagata in view of Thubert or Nagata in view of Hashiguchi and Thubert

1. *Thubert (Ex. 1007)*

Thubert discloses a system in which a supervisory device, e.g., a server, in a network assigns different access points (APs) 302 in the network to different access point groupings, i.e., virtual access point (VAP) groupings. Ex. 1007 ¶ 16. Each of the different access point groupings uses a different network path to communicate with a given endpoint (nodes) of the network. *Id.* ¶¶ 16, 47. A node treats access points in a VAP as a single access point for purposes of communicating with the network. *Id.* ¶¶ 16, 17.

2. *Analysis*

Claims 3, 9, and 16 depend from claims 1, 7, and 14, respectively, and in substance recite that a plurality of base stations receives the first data (transmitted from the external device to the electronic tag with the second communication channel) and that each base station attaches a respective energy value when transmitting the first data to the server. Ex. 1001, 8:6–10. Based on the respective energy values, the background server transmits the control instruction and the second data to the optimal base station. *Id.* at 8:11–18. To the extent that Nagata or the combination of Nagata and

Hashiguchi does not disclose this limitation, Petitioner cites Thubert as disclosing a plurality of base stations attaching respective energy information, e.g., (signal strength, signal to noise ratio, signal quality) when transmitting data to a supervisory device, i.e., a server, that designates one of the nodes as the primary AP. Pet. 74, 75–76 (citing Ex. 1007 ¶¶ 54–55, 57). According to Petitioner an ordinarily skilled artisan would have understood that providing signal quality information reduces the amount of time the label spends in the fast monitoring mode and facilitates the server’s selection of an optimal base station for subsequent communications, thereby reducing battery power consumption by providing faster completion of instruction and data transmission. *Id.* at 77 (citing Ex. 1007 ¶¶ 54–55, 57). Petitioner argues an ordinarily skilled artisan would have had reason to combine the teachings of Thubert with those of Nagata (or Nagata and Hashiguchi) for the purpose of further reducing battery consumption by straightforward use of conventional techniques. *Id.* at 78 (citing Ex. 1003, Wolfe Decl. ¶¶ 212–213).

The substance of claims 4, 10, and 17, which depend from claims 3, 9, and 16, respectively, recites that the background server performs deduplication processing on the uploaded first data. Petitioner argues that both Nagata and Hashiguchi disclose each label can communicate with multiple access points (base stations), and that an ordinarily skilled artisan would have understood Thubert teaches uploading such first data from a plurality of base stations to a supervisory device (i.e., a server). Pet. 82–83 (citing Ex. 1005 ¶ 32; Ex. 1006 ¶ 31; Ex. 1007 ¶¶ 16, 84, 93–94; Ex. 1003, Wolfe Decl. ¶ 221). Noting that Thubert discloses mapping the highest quality access points to a node to help transmit messages from the node to a supervisory device and that multiple mapped APs may receive duplicate

copies of the same message, Petitioner argues that an ordinarily skilled artisan would have found it obvious to employ the supervisory device's knowledge of network topology and AP groupings to engineer traffic to eliminate duplicate copies of the same message by comparing timestamps, MAC addresses, and other attributes of the message. *Id.* (citing Ex. 1007 ¶¶ 84, 94 Fig. 7; Ex. 1003, Wolfe Decl. ¶ 221).

Patent Owner argues that Petitioner has not established claim 1 (and presumably independent claims 7 and 14) from which claims 3, 4, 9, 10, 16, and 17 depend, is obvious. Prelim. Resp. 24. Patent Owner does not further address the limitations recited in claims 3, 4, 9, 10, 16, and 17.

Having considered the arguments and evidence of record, we determine, for purposes of institution, that Petitioner has sufficiently demonstrated that a person of ordinary skill would have had reason to combine the teachings of Thubert with those of Nagata and those of Nagata and Hashiguchi and that their combined teachings would have disclosed or suggested the limitations of claims 3, 4, 9, 10, 16, and 17 to such an ordinarily skilled artisan.

X. CONCLUSION

For the reasons discussed above, we are persuaded that Petitioner has demonstrated a reasonable likelihood that it will succeed on the following challenges to patentability:

Claims 1, 2, 5–8, 11–15, 18, 19 as obvious over Nagata and the knowledge of a person of ordinary skill in the art;

Claims 1, 2, 5–8, 11–15, 18, and 19 as obvious over Nagata in view of Hashiguchi; and

Claims 3, 4, 9, 10, 16, 17 as obvious over Nagata in view of Thubert or Nagata in view of Hashiguchi and Thubert.

XI. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314(a) an *inter partes* review of the '216 patent is hereby instituted, commencing on the entry date of this Order, and pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial.

FURTHER ORDERED that the trial is authorized on all grounds set forth in the Petition; and

FURTHER ORDERED that the trial will be conducted in accordance with a corresponding separately issued Scheduling Order.

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Patent 11,540,216 B2

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