

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CELLCO PARTNERSHIP D/B/A VERIZON WIRELESS,
Petitioner,

v.

GENERAL ACCESS SOLUTIONS, LTD.,
Patent Owner.

IPR2023-01147
Patent 9,426,794 B2

Before KEN B. BARRETT, BARBARA A. PARVIS, and
TERRENCE W. McMILLIN, Administrative Patent Judges.

BARRETT, *Administrative Patent Judge*.

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

I. INTRODUCTION

A. Background and Summary

Cellco Partnership d/b/a Verizon Wireless (“Petitioner” or “Verizon”)¹ filed a Petition requesting *inter partes* review of U.S. Patent No. 9,426,794 B2 (“the ’794 patent,” Ex. 1001). Paper 1 (“Pet.”). The Petition challenges the patentability of claims 1–6 of the ’794 patent. General Access Solutions, Ltd. (“Patent Owner”)² filed a Preliminary Response to the Petition. Paper 10 (“Prelim. Resp.”). With our authorization, Petitioner filed a Reply (Paper 12, “Pet. Reply”) and Patent Owner filed a Sur-reply (Paper 13, “PO Sur-reply”).

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.” 35 U.S.C. § 314(a) (2018). Having considered the arguments and evidence presented by Petitioner and Patent Owner, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing on at least one of the challenged claims of the ’794 patent. Accordingly, we institute an *inter partes* review as to all the challenged claims of the ’794 patent on all the grounds of unpatentability set forth in the Petition.

¹ Petitioner identifies Cellco Partnership d/b/a Verizon Wireless, Verizon Communications Inc., and Verizon Corporate Resources Group LLC as the real parties-in-interest. Pet. 2.

² Patent Owner identifies General Access Solutions, Ltd. as the real party-in-interest. Paper 5, 1.

B. Related Proceedings

Both parties identify, as a matter involving or related to the '794 patent, *General Access Solutions, Ltd. v. Cellco Partnership d/b/a Verizon Wireless et al.*, No. 2-22-cv-00394 (E.D. Tex.). Pet. 2–3; Paper 5, 1. Petitioner additionally asserts that “[t]he '794 patent shares substantial subject matter with U.S. Patent No. 9,225,555 (‘555 patent’), which was the subject of . . . *Unified Patents Inc. v. General Access Solutions, Ltd., f/k/a/Access Solutions, Ltd.*, IPR2017-01178 (instituted September 26, 2017; Final Written Decision issued September 25, 2018 (Ex. 1010)).” Pet. 3.

*C. The '794 Patent*³

The '794 patent pertains “to a manner by which to provide mobile communications in a fixed wireless access (FWA) communication system.” Ex. 1001, 3:41–43. “More particularly, the present invention relates to [an] apparatus, and an associated method, for providing WLAN (wireless local area network) service at a subscriber station of the fixed wireless access communication system.” *Id.* at 3:43–47. Figure 1 is reproduced below.

³ Patent Owner’s citations to the '794 patent omit the exhibit number. *See* Prelim. Resp. 3 n.1 (“Citations exclusively to page and line numbers are to Ex. 1001, U.S. Patent No. 9,426,794 (‘the '794 Patent’).”). To ensure clarity of the record, Patent Owner shall, in all future papers, include the exhibit number for all exhibits, including the '794 patent.

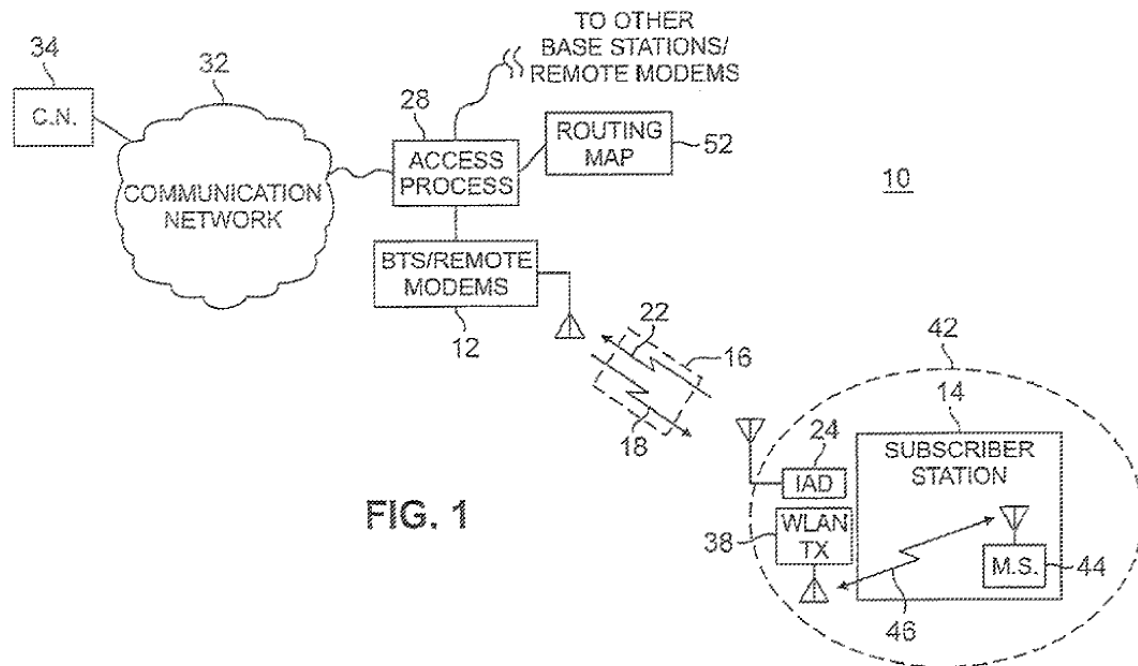


Figure 1 “illustrates a functional block diagram of a fixed wireless access (FWA) communication system.” Ex. 1001, 7:9–10. “[C]ommunication system 10 provides for radio communications between fixed-site base stations, of which the base station 12 is exemplary and fixed-site subscriber stations 14 of which the subscriber 30 station 14 is exemplary.” *Id.* at 7:27–31. Located at subscriber station 14 is integrated access device (“IAD”) 24, which forms a transceiver that transmits signals to and receives signals from base station 12. *Id.* at 7:36–43. Base station 12 is coupled to access process 28, which is coupled to communication network 32—a network such as a public switched telephone network or packet data network. *Id.* at 7:50–56. Coupled to communication network 32 is correspondent node 34. *Id.* at 7:56–57. Accordingly, a communication path may be formed between IAD 24 and correspondent node 34. *Id.* at 7:57–61. “[T]he base station communicates with [a] first transceiver and a plurality of other wireless communication devices according to a wide area wireless communication protocol.” *Id.*, code (57) (Abstract).

Also located at subscriber station 14 is wireless local area network (“WLAN”) transceiver 38 connected to the circuitry of IAD 24. *Id.* at 7:65–8:2. “The WLAN transceiver defines a coverage area 42 defining a cell.” *Id.* at 8:2–3. Mobile station 44 positioned within cell 42 is capable of communicating with WLAN transceiver 38. *Id.* at 8:3–5. “Because of the connection of the WLAN transceiver to the transceiver of [IAD 24], signals originated at the mobile station . . . can . . . be provided to the transceiver of [IAD 24] . . . and, thereafter, be communicated to another device, such as the correspondent node 34.” *Id.* at 8:15–22. “Analogously, signals originated at . . . correspondent node [34], or elsewhere, can be communicated to the mobile station.” *Id.* at 8:22–24.

Figure 2 is reproduced below.

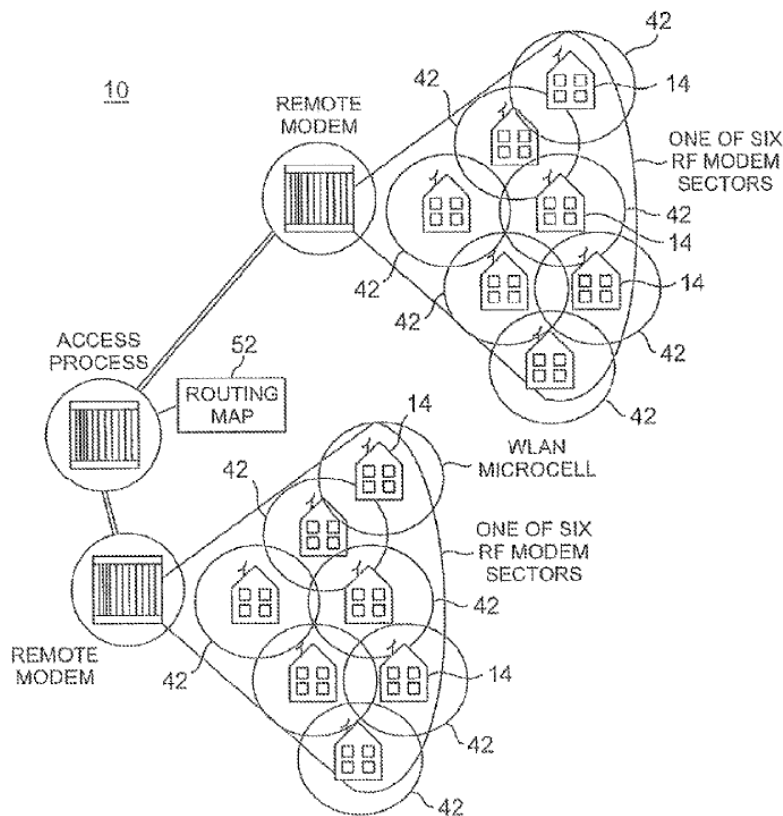


FIG. 2

Figure 2 illustrates “a fixed wireless access communication system similar to that shown in FIG. 1” but “also illustrating a plurality of cellular coverage areas defined by about a plurality of subscriber stations.” *Id.* at 7:12–15. Figure 2 shows “a plurality of subscriber stations 14 [that] include WLAN transceivers 38 (shown in FIG. 1) connected to corresponding [IADs 24].” *Id.* at 8:37–41. Each WLAN transceiver defines a coverage area 42. *Id.* at 8:41–43. A mobile station initially positioned within a first coverage area 42 defined by a WLAN transceiver at a first subscriber station “is permitted movement, such as out of the coverage area defined by the [WLAN] transceiver positioned at a first subscriber station and into the coverage area defined by a WLAN transceiver of another subscriber station.” *Id.* at 8:50–56. Upon this movement, “a handover of communications is effectuated from the first WLAN transceiver to another WLAN transceiver” to “permit continued communications with the mobile station.” *Id.* at 8:56–60.

“Determination of when to initiate handover of communications is made responsive to measurements of signal characteristics of communication signals communicated between the WLAN transceiver and the mobile station.” *Id.* at 8:61–64. “In one implementation signal characteristics are measured, or otherwise determined, at the mobile station and results of such measures or determinations of are reported back to the WLAN transceiver and appropriate control circuitry,” and “[t]hereafter, if appropriate, the handover of communications is effectuated.” *Id.* at 8:64–9:3.

D. Illustrative Claim

Of the challenged claims of the '794 patent, claims 1 and 6 are independent claims. The remaining challenged claims depend directly or indirectly from Claim 1. Claim 1, reproduced below with emphasis added to the elements primarily in dispute, is illustrative.

1. A wireless communication device, comprising:
a first wireless transceiver operable to communicate with a base station, wherein *the base station communicates with the first wireless transceiver and a plurality of other wireless communication devices according to a wide area wireless communication protocol*; and
a second wireless transceiver coupled to the first wireless transceiver and operable to directly communicate with a first mobile station and a second mobile station, wherein the second wireless transceiver communicates with the first mobile station and the second mobile station according to a local area wireless communication protocol,
wherein the first wireless transceiver receives from the base station a first downlink signal intended for the first mobile station and provides the first downlink signal to the second wireless transceiver and wherein the second wireless transceiver receives the first downlink signal and re-transmits the first downlink signal to the first mobile station as a second downlink signal according to the local area wireless communication protocol, and
wherein the second transceiver monitors first signal characteristics of the second downlink signal of the first mobile station and monitors second signal characteristics of the second mobile station, and based on the first signal characteristics and the second characteristics, routes information to the first mobile station and the second mobile station, respectively.

Ex. 1001, 10:17–45 (emphasis added).

E. Evidence

Petitioner relies on the following references:

Name	Reference	Exhibit(s)
Palmer	US 6,556,553 B1, issued April 29, 2003	1004
Hohnstein	US 6,816,706 B1, issued Nov. 9, 2004	1005
Mahany	US 5,790,536, issued Aug. 4, 1998	1006
Agrawal	US 5,722,051, issued Feb. 24, 1998	1007

Petitioner also relies on the declaration of Dr. Kevin C. Almeroth (Ex. 1002) in support of its arguments. The parties also rely on other exhibits as discussed below.

F. Asserted Grounds of Unpatentability

Petitioner asserts that the challenged claims are unpatentable on the following grounds:

Claim(s) Challenged	35 U.S.C. § ⁴	Reference(s)/Basis
1–4, 6	102(e)	Palmer
1–4, 6	103(a)	Palmer
1–6	103(a)	Hohnstein, Palmer
1–6	103(a)	Palmer, Mahany
1–4, 6	103(a)	Palmer, Agrawal
5	103(a)	Palmer, Agrawal, Mahany
1–6	103(a)	Hohnstein, Agrawal

II. DISCRETIONARY DENIAL UNDER 35 U.S.C. § 314(A)—*FINTIV*

Patent Owner argues that, in view of the parallel litigation in Texas, the Board should discretionarily deny institution of an *inter partes* review under 35 U.S.C. § 314(a) pursuant to *Fintiv*. Prelim. Resp. 45–47; *see Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 (PTAB Mar. 20, 2020)

⁴ The '794 patent was filed before the effective date of the Leahy Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), and we apply the pre-AIA version of 35 U.S.C. §§ 102 and 103.

(precedential) (setting out six nonexclusive factors that the Board may consider in determining whether to deny institution because of a parallel district-court proceeding).

Petitioner filed, in this *inter partes* review, a stipulation under *Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020 01019, Paper 12 at 19 (PTAB Dec. 1, 2020) (precedential as to § II.A). Specifically,

[Petitioner] Verizon hereby stipulates that if the Patent Trial and Appeal Board (“PTAB”) institutes an IPR in response to Verizon’s petition against General Access Solutions’ U.S. Patent No. 9,426,794 (IPR2023-01147), then Verizon will not pursue in this litigation the grounds raised in that petition for IPR or any other grounds that could have reasonably been raised before the PTAB in that proceeding.

Ex. 1016; *see also* Pet. Reply 1 (Petitioner confirming that it is submitting a *Sotera* stipulation to moot Patent Owner’s *Fintiv* arguments).

Our analysis under *Fintiv* is guided by the USPTO Director’s Memorandum issued on June 21, 2022, titled “Interim Procedure for Discretionary Denials in AIA Post Grant Proceedings with Parallel District Court Litigation” (“Director’s Memorandum”), *available at* https://www.uspto.gov/sites/default/files/documents/interim_proc_discretionary_denials_aia_parallel_district_court_litigation_memo_20220621_.pdf. The Director’s Memorandum explains that, when a petitioner makes a *Sotera*-type stipulation, “it mitigates concerns of potentially conflicting decisions and duplicative efforts between the district court and the PTAB” and “[w]ith such a stipulation, if an IPR or PGR is instituted, the grounds the PTAB resolves will differ from those present in the parallel district court litigation.” Director’s Memorandum 7 (citing *Sotera*, Paper 12 at 18–19). Pursuant to the Director’s Memorandum, we “will not discretionarily deny institution of an IPR or PGR in view of parallel district court litigation where

a petitioner stipulates not to pursue in a parallel district court proceeding the same grounds as in the petition or any grounds that could have reasonably been raised in the petition.” *Id.*

Accordingly, because Petitioner has offered a stipulation like that in *Sotera*, we do not discretionarily deny institution under *Fintiv*.

III. ANALYSIS OF PETITIONER’S CHALLENGES

A. Principles of Law

Petitioner bears the burden of persuasion to prove unpatentability of the claims challenged in the Petition, and that burden never shifts to Patent Owner. *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015).

“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros., Inc. v. Union Oil Co. of Cal.*, 814 F.2d 628, 631 (Fed. Cir. 1987); *see also Finisar Corp. v. DirecTV Group, Inc.*, 523 F.3d 1323, 1334 (Fed. Cir. 2008) (to anticipate a patent claim under 35 U.S.C. § 102, “a single prior art reference must expressly or inherently disclose each claim limitation”). Moreover, “[b]ecause the hallmark of anticipation is prior invention, the prior art reference—in order to anticipate under 35 U.S.C. § 102—must not only disclose all elements of the claim within the four corners of the document, but must also disclose those elements ‘arranged as in the claim.’” *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1369 (Fed. Cir. 2008) (quoting *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 1548 (Fed. Cir. 1983)). Whether a reference anticipates is assessed from the perspective of one of ordinary skill in the art. *See Dayco Prods., Inc. v. Total Containment, Inc.*, 329 F.3d 1358, 1368–69

(Fed. Cir. 2003) (“[T]he dispositive question regarding anticipation [i]s whether *one skilled in the art* would reasonably understand or infer from the [prior art reference’s] teaching’ that every claim element was disclosed in that single reference.” (second and third alterations in original) (quoting *In re Baxter Travenol Labs.*, 952 F.2d 388, 390 (Fed. Cir. 1991))).

Additionally, under the principles of inherency, if the prior art necessarily functions in accordance with, or includes, the claimed limitations, it anticipates. *MEHL/Biophile Int’l Corp. v. Milgraum*, 192 F.3d 1362, 1365 (Fed. Cir. 1999) (citation omitted); *In re Cruciferous Sprout Litig.*, 301 F.3d 1343, 1349–50 (Fed. Cir. 2002).

A patent claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The 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), if present, any objective evidence of obviousness or non-obviousness.⁵ *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

⁵ The parties have not directed our attention to any objective evidence of obviousness or non-obviousness. *Cf.* Pet. 82 (“There are no secondary considerations known to Petitioner that affect this strong case of obviousness.”).

B. The Level of Ordinary Skill in the Art

In determining the level of ordinary skill in the art, various factors may be considered, including the “type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field.” *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (quoting *Custom Accessories, Inc. v. Jeffrey–Allan Indus., Inc.*, 807 F.2d 955, 962 (Fed. Cir. 1986)).

Petitioner contends that:

A person of ordinary skill in the art (“POSA”) at the time of the purported invention would have had either: (1) a Bachelor of Science degree in computer science, electrical or computer engineering, or a related field, and at least 2 years of work or research experience in digital communications systems, such as wireless communications systems and networks, or equivalent, or a Master’s degree in electrical engineering, computer engineering, computer science or similar field. Additional education could compensate for less practical experience and vice versa. Ex. 1002, ¶¶1-46.

Pet. 10. Patent Owner does not address the level of ordinary skill in the art.

Petitioner’s definition is consistent with the level of ordinary skill reflected in the prior art references of record. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (recognizing that the prior art itself may reflect an appropriate level of skill in the art). For purposes of this decision, we apply Petitioner’s definition of the person of ordinary skill in the art.

C. Claim Construction

We apply the same claim construction standard used in district court actions under 35 U.S.C. § 282(b), namely that articulated in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). *See* 37 C.F.R. § 42.100(b).

In applying that standard, claim terms generally are given their ordinary and customary meaning as would have been understood by a person of ordinary skill in the art at the time of the invention and in the context of the entire patent disclosure. *Phillips*, 415 F.3d at 1312–13. “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).

Petitioner states that “no claim terms require construction.” Pet. 10. Patent Owner’s Preliminary Response does not contain a section titled Claim Construction or similar. *See* Prelim. Resp. i–ii (Table of Contents).

On this record and for purposes of this decision, we determine that no claim terms require express construction.

The Base Station

Although we see no need to provide any explicit claim construction at this time, we note that Patent Owner’s arguments in opposition to Petitioner’s challenges indicate that there may be a claim construction dispute in need of resolution. Specifically, Patent Owner argues that the “base station” recited in the independent claims has certain requirements that distinguish the claims over some of Petitioner’s prior art references.

The limitation of independent claim 1 that recites a “base station” calls for:

a first wireless transceiver operable to communicate with a base station, wherein the base station communicates with the first wireless transceiver and a plurality of other wireless

communication devices according to a wide area wireless communication protocol.

Ex. 1001, 10:18–22.

Patent Owner argues, for example, that:

The “base station” in Mahany does not satisfy the “base station” of the ’794 Patent that requires: (a) the ‘base station’ have a transceiver within a cellular network that communicates with an external network, (b) transmits forward channel broadband signals from the external network to a plurality of devices, and (c) receives reverse channel broadband signals from the plurality of devices to transmit back to the external network. The ’794 Patent describes the transceiver base station 12 being set up and coupled to ‘a communication network 32 such as a public-switched telephonic network.’ (7:50-56) The base station includes a radio link ‘upon which forward link channels 18 and reverse link channels 22’ permit broadband communications. (7:31-33)

Prelim. Resp. 28.

Patent Owner also asserts that Hohnstein’s distribution points are not base stations, arguing that:

The specification explains that these base stations [of the ’794 patent] are part of a larger “communication system” that “provides for radio communications” to multiple base stations. (7:27-29) Each base station transmits forward channel broadband signals from the external network to a plurality of devices and receives reverse channel broadband signals from the plurality of devices to transmit back to the external network. (7:31-35)

Id. at 42.

Patent Owner relies on statements in the Specification for these purported requirements of a “base station,” but does not explain adequately how or why any of those requirements should be read into the challenged claims. Additionally, we note that the base station of, for example,

independent claim 1 is not affirmatively claimed structure of the claimed “wireless communication device,” which is comprised of two transceivers. *See* Ex. 1001, 10:17–44. Rather, the recited base station serves to define the capabilities of the claimed first wireless transceiver, which must be operable to communicate with a base station according to a wide area wireless communication protocol. On the current record, we decline to read into the claims any further requirements concerning the base station beyond those expressly recited in the claims.

The parties should address these issues, focusing primarily on the intrinsic evidence, in their future respective briefs authorized in the Scheduling Order.

D. The Alleged Unpatentability of Claims 1–4 and 6 as Anticipated by or Obvious over Palmer (Ground 1)

Petitioner alleges that claims 1–4 and 6 of the ’794 patent are anticipated by or would have been obvious over Palmer. *See* Pet. 11–32. Patent Owner argues that Palmer does not anticipate the challenged claims because it is “missing . . . two transceivers that function in a WAN and LAN, respectively, and that operate according to specific protocols, and the second transceiver (or LAN transceiver) that monitors signal characteristics of the mobile stations and routes information accordingly.” Prelim. Resp. 17–18; *see also id.* at 23 (referring to an obviousness assertion by Petitioner).

1. Palmer (Ex. 1004)

Palmer pertains to relates to “wireless communication systems, and more particularly, to a method for determining when a wireless communication device should rate shift or roam in order to improve communication performance.” Ex. 1004, 1:9–12. Palmer explains:

[I]n a WLAN, a mobile worker may move throughout the work area carrying a wireless communication device such as a portable terminal or computer. The work area may be within a building or from one building to another and the mobile worker may move from one cell to another. The wireless device must maintain a wireless connection that is transparently maintained so that the central host processing unit and the mobile worker can perform their assigned tasks. As the worker travels within a cell or from one cell to another, it may become necessary for the wireless communication device to lower the transmission rate in order to maintain the connection to the transmitter/receiver of the current cell. Alternatively, the wireless communication device may switch (also known as roam) from the current cell to another cell that may offer better connection quality to the WLAN. In either case, the wireless communication device must make this transition without a loss of connection or service degradation being noticed by the mobile worker or the central host processing unit. The transition should be seamless and appear and operate as a wired connection.

Id. at 1:53–2:6. Palmer further explains that then-existing methods for determining whether to rate shift or roam were relatively inflexible and reacted to the current state rather than anticipated the state, thus resulting in performance problems. *Id.* at 2:7–25. According to Palmer, Palmer’s disclosed method “improves communication by dynamically and flexibly anticipating when a rate shift or roam should occur.” *Id.* at 2:63–65.

Figure 2 of Palmer is reproduced below.

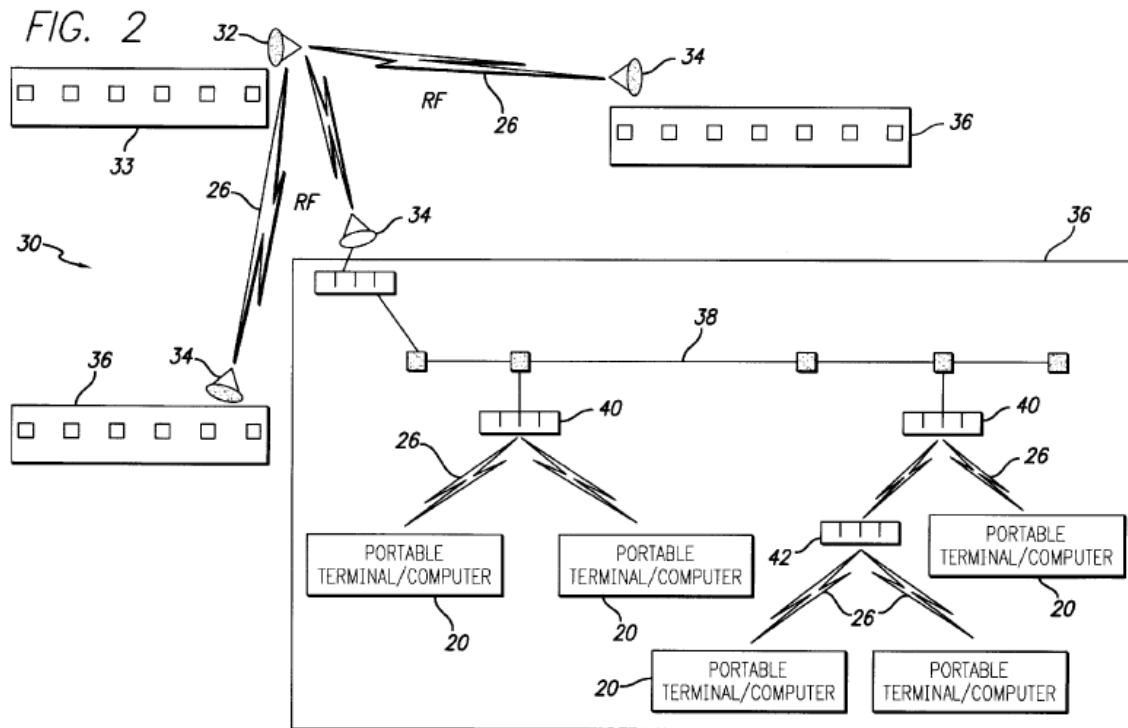


Figure 2 illustrates a communications system. *Id.* at 4:53. Palmer states that “[t]he communication system 30 [shown in Figure 2 above] . . . provid[es] wireless coverage not only within a building, but also among several buildings or even within a city.” *Id.* at 4:53–57.

The communication system 30 includes a central antenna 32 that communicates through RF [(radio frequency)] links 26 to a plurality of remote antennas 34. The central antenna 32 may be attached to an administration building 33 or other central location based upon the location of the remote antennas 34. The remote antennas 34 may be located on various buildings 36 or other convenient remote locations. The building 36 may include a wired network 38 with a plurality of access points 40. The access point 40 . . . would consist of a transmitter/receiver defining a cell 18 [as shown in Figure 1] that provides RF coverage for the wireless communication devices 20.

Id. at 4:57–5:1. “The wired network 38 is then linked to the administration building 33 and its associated network through the remote antenna 34 to the

central antenna 32 and finally through its link to a wired network (not shown [in Figure 2]) within the administration building 33.” *Id.* at 5:4–9.

Palmer explains that, as a mobile worker with wireless communication device 20 moves throughout the work area, it is necessary for wireless communication device 20 to maintain the wireless connection. *Id.* at 5:10–13. “In FIG. 2, the wireless communication device 20 may also transition between buildings or comprise part of a wireless wide area network.” *Id.* at 5:17–19.

If the RF connection begins to degrade, a determination should be made as to whether communication performance would improve by transmitting at a lower information rate or roaming to another cell offering a higher quality RF connection. This determination could be made by the wireless communication device 20 having a processor and a memory, with the processor executing a stored program for carrying out the method steps discussed below. Alternatively, the method steps may be performed centrally, for example, by the network or a central host processor.

Id. at 5:26–36

Palmer discloses “a predictive method for determining when a communication device should rate shift or roam in a wireless environment.” *Id.* at 5:37–40. “The method would utilize various measurements to evaluate connection quality.” *Id.* at 5:41–42. “These measurements may include but are not limited to: 1) signal-to-noise ratio (SNR), 2) bit error rate (BER), 3) number of transmission retries (NTR), 4) received signal strength indicator (RSSI), 5) bit energy-to-noise density (E_b/N_o), 6) global position information (GPS), and 7) cell congestion information (also known as load factor).” *Id.* at 5:43–49.

2. *Claim 1—The Alleged Anticipation by or Obviousness over Palmer*

a. *A wireless communication device, comprising:*

Petitioner contends that “Palmer describes a wireless communication device, such as a remote antenna 34 in combination with an access point 40,” and maps those two components, respectively, to the recited first and second wireless transceivers. Pet. 13–16. We discuss that mapping below in the context of the pertinent limitations.

b. *a first wireless transceiver operable to communicate with a base station, wherein the base station communicates with the first wireless transceiver and a plurality of other wireless communication devices according to a wide area wireless communication protocol; and*

Petitioner contends that “Palmer describes a first wireless transceiver (e.g., remote antenna 34 attached to remote building 36) operable to communicate with a base station (e.g., central antenna 32 attached to administration building 33),” and that the communication therebetween is through RF links and, therefore, the remote antenna 34 is wireless. Pet. 16–17. Petitioner further contends that central antenna 32 (mapped to the base station) also communicates with “a plurality of other wireless communication devices (e.g., other instances of antennas 34 in additional remote buildings 36 illustrated in Figure 2).” *Id.* at 18 (citing Ex. 1004, 4:57–64, Fig. 2).

As to the recited protocol, Petitioner contends:

The communications between central antenna 32 and the multiple remote antennas 34 involve a wide area wireless communication protocol, as Palmer describes that its system in Figures 1-2 could span an entire “city” (*id.*, 4:53-57) and also refers to its invention incorporating “the use of **industry standard network protocols** by the wireless media.” *Id.*, 2:52-

55. A [person of ordinary skill in the art] would have understood those industry standard protocols to include wireless wide area communication protocols such as cellular protocols. Ex. 1002, ¶¶78-81; Ex. 1015, pp.479, 505.

Pet. at 18–19 (footnotes omitted). Petitioner also contends that Palmer has the same level of disclosure of a “protocol” and a “wide area wireless communication protocol” as the ’794 patent, asserting that those terms appear only in the abstract and the claims themselves. Pet. 18–19 nn.4–5; *id.* at 18 n.4 (“Beyond these three instances, the ’794 patent does not even mention the term ‘wide’ or even ‘WAN’ (*i.e.*, wide area network).”).

Petitioner additionally contends, in the alternative, that, “[t]o the extent the Board disagrees that such communications in Palmer involve a wide area wireless communication protocol, a [person of ordinary skill in the art] would have nonetheless found it obvious to utilize such a protocol, especially given Palmer explicitly contemplates its communication system spanning an entire ‘city’ . . . which would have prompted use of wide area protocols.” *Id.* at 19 (citing Ex. 1002, ¶¶ 73–82; Ex. 1004, 4:53–57). In support of Petitioner’s obviousness contentions, Dr. Almeroth testifies that:

A POSA would have recognized that wide area wireless communication protocols are appropriate in circumstances requiring wireless data transmissions over a longer distance, compared to smaller distances where a local area protocol may suffice. A POSA would have appreciated that using a wide area wireless communication protocol would have been a simple matter of design choice that incorporates known techniques with expected outcomes, and would have been appropriate for transmission between buildings or across a city, as described in Palmer.

Ex. 1002 ¶ 82.

Patent Owner argues that Palmer fails to disclose a base station that communicates according to a wide area wireless communication protocol. Prelim. Resp. 18 (section heading). Specifically, Patent Owner argues that:

[T]he Petitioner cites no evidence that “central antenna 32” [mapped to the recited base station] communicates according to wide area wireless communication protocols because it does not. The “central antenna 32” merely serves as a wireless conduit connecting the “remote antenna 34” to a wired network—central antenna 32 connects “to a **wired network** (not shown) within the administration building 33.” Ex. 1004, 5:4-9 (emphasis added). Thus, the fundamental infrastructure Palmer discloses has a wireless transceiver connected to a wired network; it nowhere contemplates the cellular broadband “backhaul” that is central to the ’794 Patent.

Id. at 19; *see also id.* at 36 (Patent Owner arguing, in the context of Ground 2, that “[t]he ’794 Patent . . . uses . . . “a ‘cellular backhaul’ wireless signal that is transmitted in a WAN by a base station and operates according to a WAN protocol.”).

Patent Owner, in the block quote above, emphasizes the phrase “wired network” and is referring to the side of Palmer’s central antenna 32 that is connected to a network in the administration building. Patent Owner, in the same block quote above, agrees that the other side of central antenna 32—the connection to remote antennas 34 (mapped to the second wireless transceiver)—is a wireless connection. *Id.* at 19 (referring to central antenna 32 as “a wireless conduit”). It is the latter connection that is pertinent to the subject limitation, which calls for the “first wireless transceiver” to be “operable to communicate with a base station, wherein the base station communicates . . . according to a wide area wireless communication protocol.” Ex. 1001, 10:18–22. To the extent that Patent Owner argues that a wired connection on the central antenna’s

administration-building-side precludes it from being a “base station” within the meaning of the claims, we do not agree with that argument on the present record. Patent Owner has not explained adequately the basis for such a narrow reading of the claim or, for example, why a wired side precludes the wireless side of Palmer’s central antenna 32 from communicating according to wide area wireless communication protocols, as Patent Owner implies.

Patent Owner next notes that Petitioner refers to Palmer’s transmission spanning an entire city, and argues that “[b]y arguing that geographic scope alone should suffice, the Petitioner improperly reads out the ‘protocol’ limitation.” *Id.* at 19–20 (citing Pet. 19). We do not agree with Patent Owner’s argument. Petitioner does not argue geographic scope alone. Petitioner pairs, in the same sentence, the concept of a city-wide system (which we understand Petitioner to contend indicates a wireless wide area network) and Palmer’s statement about the use of “the use of industry standard network protocols by the wireless media.” Pet. 18–19 (citing Ex. 1004, 2:52–55, 4:53–57) (emphasis and footnote omitted). Dr. Almeroth offers the currently unrebutted testimony that a person of ordinary skill in the art “would have therefore understood based on these teachings in Palmer that a wide area wireless communication protocol is used for the wireless transmissions between central antenna 32 and the multiple remote antennas 34.” Ex. 1002 ¶ 79.

Patent Owner—in response to Petitioner’s contention that Palmer “refers to its invention incorporating ‘the use of industry standard network protocols by the wireless media,’” Pet. 19 (emphasis omitted)—argues that “the relevant section in Palmer **disparages** the existing ‘industry standard network protocols,’ and explains instead how its method differs from—and

improves upon—those protocols.” Prelim. Resp. 20. Patent Owner quotes from Palmer’s description of related art and emphasizes the phrase: “The method would further reduce network connection losses due to the use of industry standard network protocols.” *Id.* (quoting Ex. 1004, 2:47–57 (emphasis omitted)); *see* Ex. 1004, 1:7, 1:14, 2:59 (Palmer’s subheading “Description of Related Art” under the “BACKGROUND OF THE INVENTION” heading and before “SUMMARY OF THE INVENTION”). Patent Owner asserts that, “[i]n context, Palmer discusses how its method would reduce the ‘network connection losses’ that occur when using the relatively ineffective ‘industry standard network protocols,’ and further argues that “the relevant language in Palmer explicitly teaches away from using wireless WAN protocols.” Prelim. Resp. 20–21.

To the extent that Patent Owner is arguing that the claimed invention would not be obvious because Palmer purportedly teaches away from utilizing wireless WAN protocols, we do not agree with that argument on the present record. Patent Owner presents, at this stage, mere attorney argument in interpreting Palmer, whereas Dr. Almeroth provides unrebutted testimony that “Palmer . . . describes utilizing industry standard network protocols for wireless communication,” that a person of ordinary skill in the art “would have understood those industry standard protocols described in Palmer to include wireless wide area communication protocols such as cellular protocols,” and that “[c]ellular and other long-distance radio frequency protocols were already well known in the art by the time of Palmer.” Ex. 1002 ¶¶ 78, 81 (internal quotation mark omitted); *see, e.g., Gemtron Corp. v. Saint-Gobain Corp.*, 572 F.3d 1371, 1380 (Fed. Cir. 2009) (“[U]nsworn attorney argument . . . is not evidence and cannot rebut . . .

other admitted evidence”). Dr. Almeroth also testifies that, even if Palmer is deemed to not involve the recited protocol, the use of such would have been obvious because a person of ordinary skill in the art “would have recognized that wide area wireless communication protocols are appropriate in circumstances requiring wireless data transmissions over a longer distance, compared to smaller distances where a local area protocol may suffice.” Ex. 1002 ¶ 82.

We determine that Petitioner has demonstrated a reasonable likelihood of proving that Palmer discloses or at least suggests “a first wireless transceiver operable to communicate with a base station, wherein the base station communicates with the first wireless transceiver and a plurality of other wireless communication devices according to a wide area wireless communication protocol,” as recited in claim 1.

c. a second wireless transceiver coupled to the first wireless transceiver and operable to directly communicate with a first mobile station and a second mobile station, wherein the second wireless transceiver communicates with the first mobile station and the second mobile station according to a local area wireless communication protocol,

Petitioner contends that “Palmer describes a second wireless transceiver (*e.g.*, access point 40) coupled to the first wireless transceiver (*e.g.*, through wired network 38),” and that “[a]ccess point 40 directly communicates with a first mobile station and a second mobile station (*e.g.*, portable terminals 20).” Pet. 20 (citing Ex. 1004, 4:38–40, 4:65–5:1, 5:10–14, Fig. 2). Petitioner further contends that “Palmer’s access point 40 communicates with the portable terminals 20 according to a local area wireless communication protocol, since the terminals 20 connect wirelessly to a wireless local area network,” and that a person of ordinary skill in the

art “would have readily understood that those industry standard network protocols would include well-known local area network protocols such as IEEE 802.11 (WiFi).” *Id.* at 21–22 (citing 1:23–27, 1:53–55, 2:52–55, 5:1–3, 5:10–14; Ex. 1002 ¶¶ 83–88) (emphasis and footnote omitted). Petitioner also contends that “using ‘protocols’ in wireless communications was well known in the field and would have formed, at least, an obvious part of the system.” *Id.* at 21 n.6 (Ex. 1002 ¶¶ 87–88).

Although Patent Owner asserts, for example in a section heading, that Palmer fails to disclose local area network protocols, Patent Owner does not meaningfully address Petitioner’s contentions in that regard. *See, e.g.*, Prelim. Resp. 17 (LAN protocols mentioned in heading “A” but not in the summary paragraph immediately under that heading).

d. wherein the first wireless transceiver receives from the base station a first downlink signal intended for the first mobile station and provides the first downlink signal to the second wireless transceiver and wherein the second wireless transceiver receives the first downlink signal and re-transmits the first downlink signal to the first mobile station as a second downlink signal according to the local area wireless communication protocol, and

Petitioner contends that Palmer discloses “a first downlink signal (*e.g.*, voice or data signal sent from the central antenna 32 [mapped to the base station] to the remote antenna 34 [mapped to the first wireless transceiver])” and remote antenna 34 providing that signal to access point 40 (mapped to the second wireless transceiver), which re-transmits the signal as a second downlink signal to wireless communication devices 20 (mapped to the first mobile station). Pet. 22–24. Petitioner further contends that “[s]uch re-transmission is performed according to the local area wireless communication protocol, since Palmer discloses ‘the use of industry

standard network protocols by the wireless media.” *Id.* at 24 (citing Ex. 1004, 2:52–55; Ex. 1002 ¶¶ 89–92).

- e. wherein the second transceiver monitors first signal characteristics of the second downlink signal of the first mobile station and monitors second signal characteristics of the second mobile station, and based on the first signal characteristics and the second characteristics, routes information to the first mobile station and the second mobile station, respectively.*

Petitioner contends that Palmer discloses a predictive method for determining when a communication device should rate shift or roam in a wireless environment with the method involving monitoring and utilization of certain measurements—such as signal-to-noise ratio (SNR) and received signal strength indicator (RSSI)—to evaluate connection quality. Pet. 24–25 (citing Ex. 1004, 5:37–49). Petitioner further contends that:

Palmer’s access point 40 performs such monitoring, as Palmer describes the monitoring “may be performed centrally, for example, ***by the network***” ([Ex. 1004,] 5:34–36) and the access point 40 is part of the network and the specific component directly interacting wirelessly with the portable terminals 20 and therefore collecting such measurements. And to the extent the Board disagrees that Palmer’s access point 40 performs the monitoring, it would have nonetheless been obvious to a [person of ordinary skill in the art] to select the access point 40 to perform the monitoring, since it directly communicates with the portable terminals 20.

Id. at 25–26 (citing Ex. 1002 ¶ 96) (footnote omitted); *see also id.* at 27 (citing Ex. 1002 ¶¶ 93–98). Petitioner further contends that the WLAN transceiver’s receiving of reported measurements corresponds to the recited “monitoring.” *See id.* at 8 n.1; *id.* at 25 n.7 (“[T]he ’794 patent does not specifically disclose that the ‘monitoring’ require[s] the actual measurements of the signal characteristics be performed by its WLAN

transceiver.”); *id.* at 7–8 (quoting Ex. 1001, 8:64–9:3 and asserting: “Nor does the ’794 patent explicitly teach the WLAN transceiver or access point performing any monitoring action beyond just receiving the reported measurements.” (citing Ex. 1002 ¶¶ 47–55)). In support of Petitioner’s obviousness contention, Dr. Almeroth testifies:

The access point 40 is the component that directly communicates with the portable terminals 20, and therefore the access point 40 would have been the most logical component to handle the monitoring of the signal connection between itself and the portable terminal. A [person of ordinary skill in the art] would have appreciated having Palmer’s access point 40 perform the monitoring functions described in Palmer, would have been a simple matter of design choice among a finite and limited number of possible components to perform these functions, incorporates known techniques with expected outcomes, and would have been an appropriate component for performing the monitoring functions described in Palmer.

Ex. 1002 ¶ 96.

As to the claim’s recitation that the second transceiver “monitors second signal characteristics of the second mobile station,” Petitioner contends that Palmer’s access point 40 also monitors signal characteristics of a second portable terminal 20 because it monitors the disclosed signal characteristics for all portable terminals 20. Pet. 26 (citing Ex. 1004, 5:37–49, 6:45–47).

Petitioner further contends that access point 40 routes information as recited because “access point 40 determines whether roaming by a portable terminal 20 should take place and routes data packets accordingly.” Pet. 26–27 (citing Ex. 1004, 5:20–36); *see also id.* at 27 n.9 (Petitioner contending that the Specification of the ’794 patent likewise describes using measured characteristics to determine whether to initiate a handoff (citing Ex. 1001,

8:50–9:3)). According to Petitioner, Palmer discloses that access point 40 determines when the wireless RF connection becomes unstable based on the measurements and “determines whether or not to reduce the data rate or to hand off the wireless connection to another access point,” and “[o]nce a mobile station has been handed off to a new access point based on the signal monitoring, the original access point no longer routes downlink signals to the mobile station to which it is no longer connected.” *Id.* at 27 (citing Ex. 1004, 5:20–36; Ex. 1002 ¶¶ 93–98).

Patent Owner argues that “Palmer does not include any disclosure that access point 40 [mapped to the second transceiver] monitors signal characteristics of the mobile devices and routes information based on monitoring . . . signal characteristics.” Prelim. Resp. 21. According to Patent Owner, Palmer “explains that other parts of Palmer’s system—not access point 40—perform the functions that the Petitioner alleges meet the monitoring signal characteristics limitations,” and that “Palmer discloses that the ‘predictive method’ that the Petitioner claims is ‘monitoring signal characteristics’ is done either by the mobile station 20 in Palmer, or by the central network.” *Id.* at 22 (citing Ex. 1004, 5:19–36).

Patent Owner further argues that Petitioner’s reliance on Palmer’s description of monitoring being “performed centrally, for example, by the network,” is flawed. *Id.* at 22–23 (quoting Ex. 1004, 5:34–36; citing Pet. 25). Patent Owner asserts that “the ‘network’ being referred to in the relevant section in Palmer is ‘wired network 34,’” and that “[a]ccess points 40 are not part of the ‘wired network 34.’” *Id.* at 23 (citing Ex. 1004, 5:12–13); *see also id.* (Patent Owner asserting that access point 40 is not part

of the central network and “indeed the ‘wired network (34)’ is part of the wired WAN, not the wireless LAN in Palmer.”).

We do not agree with Patent Owner’s characterizations of Palmer, which are based in large part on the assertion that Palmer’s element 34 is the wired network, which, in turn, is based on what clearly is a typographical error. The cited portion of Palmer mentioning “the wired network 34” is referring to Figure 1, which does not contain an element 34 but does depict wired network 14; thus, the quote should read “the wired network 14,” not “34.” *See* Ex. 1004, 4:26–28, 5:10–14, Fig. 1; *see also id.* at 4:59 (identifying element 34 as remote antennas of the Figure 2 embodiment). In the Figure 2 embodiment, access points 40, which Petitioner contends are part of the network and perform the signal monitoring, are included in wired network 38. *Id.* at 4:64–65. Additionally, Dr. Almeroth provides opinion testimony, which is un rebutted at this stage, that Palmer’s access point 40 performs the monitoring and provides a basis for that opinion. Ex. 1002 ¶ 95 (quoting Ex. 1004, 5:26–36).

Further, Patent Owner does not address meaningfully Petitioner’s contention (Pet. 25–26) that, in the alternative to its anticipation theory, that it would have been obvious to a person of ordinary skill in the art to select the access point 40 as the component to perform the monitoring. *See* Prelim. Resp. 23 (Patent Owner arguing that “[t]he Petitioner’s reliance on its expert to supply the missing claim element under the guise of obviousness cannot suffice for anticipation as well,” and citing anticipation caselaw).

We determine that Petitioner has demonstrated a reasonable likelihood of proving that Palmer discloses or at least suggests that “the second transceiver monitors first signal characteristics of the second downlink

signal of the first mobile station and monitors second signal characteristics of the second mobile station, and based on the first signal characteristics and the second characteristics, routes information to the first mobile station and the second mobile station, respectively,” as recited in claim 1.

f. Conclusion as to Independent Claim 1

Having considered the parties’ arguments and evidence, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing in its challenge to claim 1 as anticipated by, or in the alternative, obvious over Palmer.

3. Claims 2–4 and 6—The Alleged Anticipation by or Obviousness over Palmer

Claim 6 is an independent claim directed to a method for communicating with a wireless communication device, and recites limitations similar to those of independent claim 1. The remaining claims subject to this ground, claims 2–4, each depends directly or indirectly from independent claim 1. Petitioner contends that each of those claims 2–4 and 6 are anticipated by or would have been obvious over Palmer. Pet. 28–32. Patent Owner does not raise any arguments regarding Petitioner’s contentions beyond those addressed above for independent claim 1. Having considered the arguments and evidence, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing in its challenge to claims 2–4 and 6 as anticipated by, or in the alternative, obvious over Palmer.

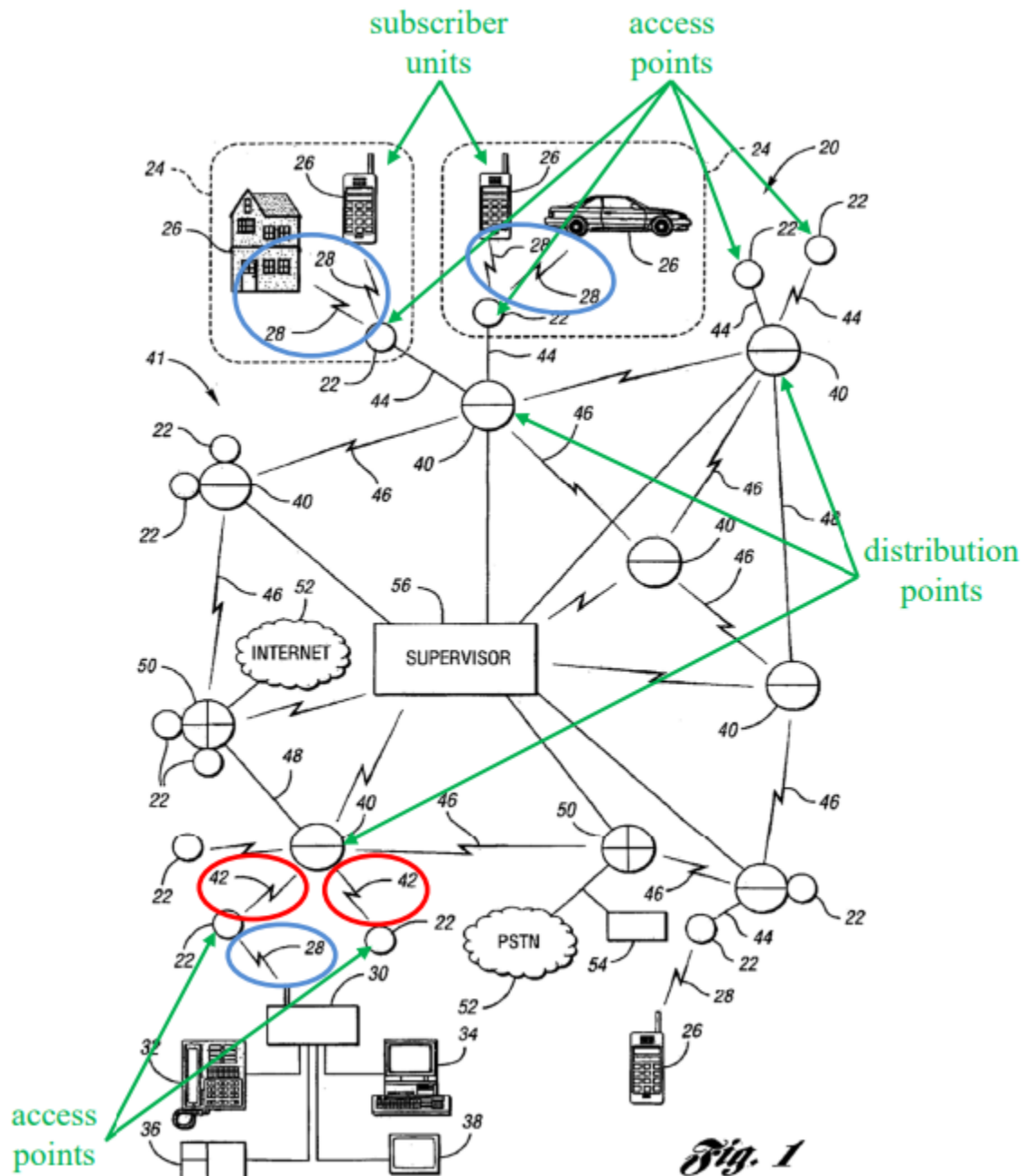
E. The Alleged Unpatentability of Claims 1–6 as Obvious over Hohnstein and Palmer (Ground 2)

Petitioner alleges that claims 1–6 of the ’794 patent would have been obvious over Hohnstein and Palmer. *See* Pet. 37–67.⁶ Patent Owner argues that Hohnstein lacks two different networks operating according to different protocols and lacks a second transceiver that monitors signal characteristics and routes information accordingly. Prelim. Resp. 39–44.

1. Hohnstein (Ex. 1005)

Hohnstein pertains to “equipment through which subscriber units access a wireless communication system.” Ex. 1005, 1:18–19. Hohnstein describes a communication system with “a plurality of access points 22 which may be, for example, a local radio access point (LRAP).” *Id.* at 4:9–11. Figure 1 of Hohnstein, as annotated by Petitioner, is reproduced below:

⁶ Petitioner asserts that “the Board already found unpatentable a related patent containing similar claims, based on Hohnstein.” Pet. 33 (section heading with capitalization and bolding omitted). Petitioner is referring to a prior IPR, which involved a different patent and a different petitioner and different arguments. *See, e.g., id.* at 33–36; Ex. 1010 (the final written decision in IPR2017-01178). Patent Owner disagrees with Petitioner’s characterizations. *See* Prelim. Resp. 9–14, 35–39, 44. The claims of the two patents contain substantive differences, and the prior IPR was decided under a broadest reasonable claim construction standard, *see* Ex. 1010, 9. In the current IPR, we evaluate only the current Petitioner’s arguments and evidence and, as mentioned above, apply the *Phillips* claim construction standard. The parties similarly should focus on the issues currently before us rather than what transpired in the prior IPR.



Pet. 38; Ex. 1005, Fig. 1. Figure 1, with annotations by Petitioner, illustrates Hohnstein's communication system in which "[e]ach access point 22 defines coverage area 24 such as, for example, a cell, covering a reception range of access point 22." *Id.* at 4:11–13. "Subscriber unit 26 within coverage area 24 may establish two-way wireless link 28 with access point 22." *Id.* at 4:16–18. Each access point, in turn, communicates with at least one

distribution point 40 over radio link 42, or may be wired or cabled to distribution point 40 through wireline link 44, or may be packaged with distribution point 40. *Id.* at 5:42–48.

Hohnstein’s distribution points 40 route packets within the network, such as from another distribution point, from subscriber unit 26 in communication with distribution point 40 through access point 22, or from an external communication system, to an access point 22, to another distribution point 40, or to other networks. *Id.* at 5:57–59, 6:34–48, 8:49–54. In that regard, Hohnstein states:

Distribution point 40 also includes back end communication interfaces 106 for connecting distribution point 40 with additional distribution points 40, with supervisor 56, and, if distribution point 40 is a gateway 50, with telecommunication systems, private network systems, video distribution systems, the Internet, or the like. This may be typically referred to as backhaul communication.

Id. at 8:49–55.

Hohnstein’s access point 22 may be embodied as an antenna module 502 with multiple transceivers. *See id.* at 13:40–46, 15:1–18, 15:29–33, Figs. 9, 11; *see also id.* at 16:33–37 (the antenna system of Figure 13, “implements a combined access point 22 and distribution point 40”). Hohnstein’s Figure 11 is reproduced below.

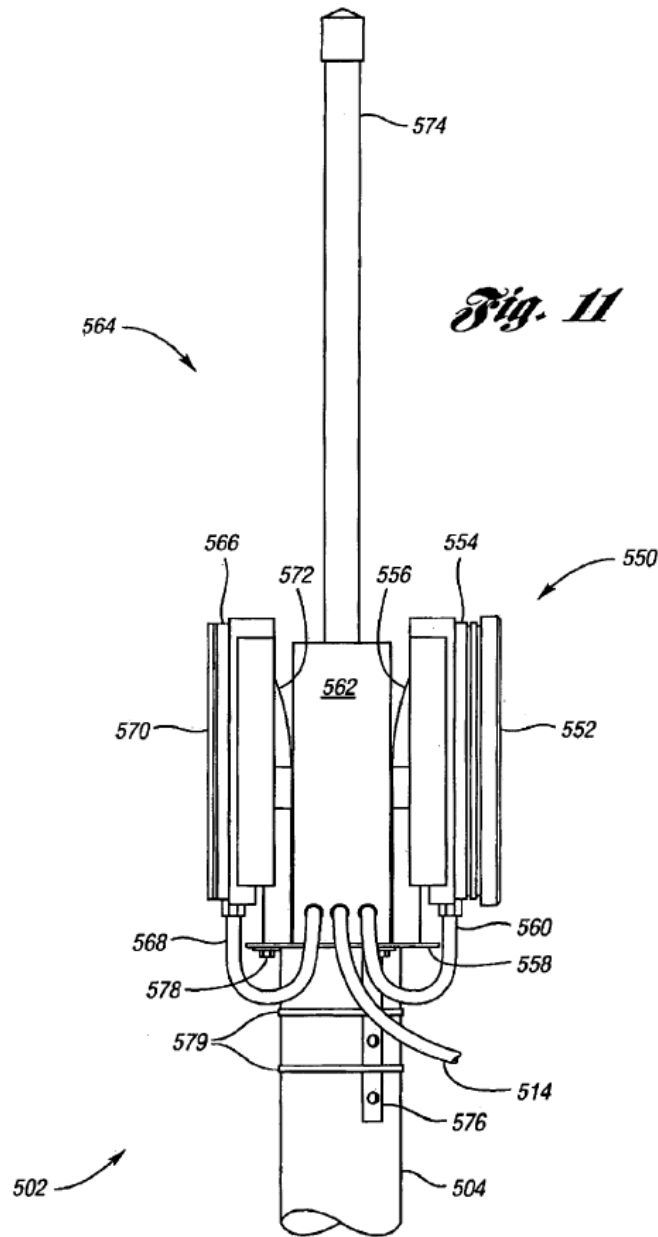


Figure 11 is an elevation view drawing of an antenna system according to an embodiment of Hohnstein. *Id.* at 3:63–64. Antenna module 502 includes backhaul system 550, which has backhaul antenna 552 attached to backhaul data terminal 554. *Id.* at 15:15–18. Antenna module 502 also includes access system 564, which includes access data terminal 566 connected to junction box 562 through access cable 568. *Id.* at 15:29–32. “Directional

access antenna 570 is attached to access data terminal 566 and may form a directional coverage area 24 for access point 22.” *Id.* at 15:32–34.

“[A] quality error bit rate is established for each subscriber unit 26.” *Id.* at 5:1–2. “The quality error bit rate may be modified while subscriber unit 26 is within communication system 20 to reflect changing conditions such as noise, demand, connectivity, or any other suitable parameter.” *Id.* at 5:8–11. “Applications providing services to subscriber unit 26 may adjust these services based on the quality error bit rate,” and, for example, “may reduce the frame update rate as noise increases, guaranteeing successful transmission at a lower information rate.” *Id.* at 5:12–17. “Control of the information rate may be achieved by having subscriber unit 26 monitor a signaling channel transmitted by access point 22 for each coverage area 24.” *Id.* at 5:22–24.

2. Independent Claim 1

a. Summary of Petitioner’s Contentions Regarding the Alleged Obviousness of Independent Claim 1 over Hohnstein and Palmer

Petitioner summarizes its mapping of Hohnstein’s disclosures to the elements of independent claim 1 of the ’794 patent as follows:

Hohnstein describes a first wireless transceiver (*e.g.*, backhaul system 550) communicating with a base station (*e.g.*, another distribution point 40) according to a wide area wireless communication protocol, and a second wireless transceiver (*e.g.*, access system 564) coupled to the backhaul system 550 and communicating wirelessly with mobile stations (*e.g.*, subscriber units 26). Further, the access system 564 receives a first downlink signal from the backhaul system 550 and re-transmits it to a subscriber unit 26 (*e.g.*, mobile telephone) as a second downlink signal according to a local area wireless communication protocol. Hohnstein teaches monitoring signal characteristics of downlink signals of subscriber units, as a

quality error bit rate, and also describes the access point 22 routing information to first and second subscriber units 26 based on whether the respective subscriber unit is connected to the access point 22 or has been handed off to another access point.

Pet. 40–41.

Petitioner further contends that, “to the extent Hohnstein’s monitoring is found to differ from the claimed monitoring limitations, Palmer discloses these limitations.” *Id.* at 41. Petitioner contends that it would have been obvious to use Palmer’s monitoring approach (discussed in the first ground) in Hohnstein’s access point to determine when to perform a roaming handoff. *See id.* at 44, 59.

As mentioned, Patent Owner argues that Hohnstein lacks two different networks operating according to different protocols and lacks a second transceiver that monitors signal characteristics and routes information accordingly. Prelim. Resp. 39–44. We address the parties’ respective positions below.

- b. a first wireless transceiver . . . wherein the base station communicates with the first wireless transceiver and a plurality of other wireless communication devices according to a wide area wireless communication protocol; and*
a second wireless transceiver . . . wherein the second wireless transceiver communicates with the first mobile station and the second mobile station according to a local area wireless communication protocol

Independent claim 1 recites a first transceiver and a second transceiver communicating with other components via, respectively, a wide area wireless communication protocol and a local area wireless communication protocol. Ex. 1001, 10:18–29.

Petitioner contends that:

The communications between the distribution point 40 [mapped to the base station] and the multiple access points 22 via wireless link 42 [circled in red in the annotated Figure 1 above] involve a wide area communication protocol, as Hohnstein describes such communications as “backhaul communication” that includes communication over the Internet, which involves wide area networks and communication protocols. *Id.*, 16:15-21, 8:49-55. Moreover, while Hohnstein describes wireless links 28 of access points 22 as having a limited wireless coverage area 24 (illustrated in Fig. 1), Hohnstein offers no parallel limiting description of coverage area for wireless links 42—a POSA would therefore have understood that wireless links 42 are wide area links (communicating via a wide area communication protocol), as distinguished from wireless links 28 [circled in blue in the annotated Figure 1 above] which are local area links (communicating via a local area communication protocol). Ex. 1002, ¶¶137-41.

Pet. 51–52; *id.* at 55 (“[W]ireless communication between access system 564 and subscriber unit 26 via wireless link 28 uses a local area wireless communication protocol.” (citing the earlier discussion for the WWAN protocol limitation and Ex. 1002 ¶¶ 142–145)).

Patent Owner argues that Hohnstein lacks the two network protocols of the challenged claims. *See, e.g.*, Prelim. Resp. 35–37. Specifically, Patent Owner argues that “Hohnstein provides for a one-layer ‘mesh’ network, while the ’794 Patent claims two distinct WAN and LAN networks.” *Id.* at 37. Patent Owner further argues that, “[c]ontrary to the Petitioner’s mischaracterization, the distribution points 40 and access points 22 in Hohnstein are essentially the same structure with the same functions.” *Id.* at 39. Patent Owner additionally argues that “Hohnstein’s distribution point 40 does not operate like the base station disclosed in the ’794 Patent,” and that, “to the extent that ‘distribution point 40’ transmits

according to any ‘protocols,’ they would be the same protocols that govern communications of Hohnstein’s access points 22.” *Id.* at 40.

We do not agree with Patent Owner’s arguments on the present record. Patent Owner’s interpretation of Hohnstein’s disclosure primarily is unsupported attorney argument, which is not evidence. *See Gemtron Corp. v. Saint-Gobain Corp.*, 572 F.3d at 1380. On the other hand, Petitioner’s contentions are supported by the presently-unrebutted testimony of Dr. Almeroth. *See, e.g.*, Ex. 1002 ¶¶ 137–145.

Patent Owner also argues that Petitioner incorrectly characterizes certain of Hohnstein’s disclosures that Petitioner contends indicates that a wide area communication protocol is used. *See* Prelim. Resp. 40–42. Petitioner, for example and as mentioned above, contends that communications between distribution point 40 and access points 22 (mapped, respectively, to the base station and the WWAN transceiver) “involve a wide area communication protocol, as Hohnstein describes such communications as ‘backhaul communication’ that includes communication over the Internet, which involves wide area networks and communication protocols.” Pet. 51 (citing Ex. 1005, 16:15–21, 8:49–55; Ex. 1002 ¶¶ 137–141). Patent Owner argues that “the ‘communication over the Internet’ the Petitioner references are effected by ‘[s]pecial distribution points, such as gateway 50,’ not distribution point 40,” and that “distribution point 40 (which Petitioner identifies as the ‘base station’) does not communicate directly with the Internet and would have no reason to utilize any associated WAN protocols. Prelim. Resp. 41–42 (quoting Ex. 1005 at 6:57–64); *see also id.* at 40–41 (Patent Owner acknowledging that Hohnstein discloses distribution point 40 communicating with an external system, but argues that

“Hohnstein provides no disclosure of what this ‘external communication system’ entails.” (citing Ex. 1005, 6:34–37)).

Hohnstein states that: “Distribution point 40 also includes back end communication interfaces 106 for connecting distribution point 40 . . . , if distribution point 40 is a gateway 50, with . . . the Internet This may be typically referred to as backhaul communication.” Ex. 1005, 8:49–55.

Thus, we understand Hohnstein to indicate that gateway 50—connecting to the Internet—is a particular type of distribution point 40, not an entirely different device as Patent Owner implies. Accordingly, on the present record, we do not agree with Patent Owner’s arguments that Petitioner’s protocol-related contentions are unsupported by Hohnstein’s disclosure.

We determine that Petitioner has demonstrated a reasonable likelihood of proving that Hohnstein discloses or at least suggests two transceivers that communicate according to the two different protocols recited in claim 1.

- c. wherein the second transceiver monitors first signal characteristics of the second downlink signal of the first mobile station and monitors second signal characteristics of the second mobile station, and based on the first signal characteristics and the second characteristics, routes information to the first mobile station and the second mobile station, respectively*

Petitioner contends that “Hohnstein teaches monitoring signal characteristics of downlink signals of subscriber units, as a quality error bit rate, and also describes the access point 22 routing information to first and second subscriber units 26 based on whether the respective subscriber unit is connected to the access point 22 or has been handed off to another access point.” Pet. 41; *see id.* at 58–59. Petitioner asserts that the quality error bit reflects changing conditions such as noise. *Id.* at 58 (citing Ex. 1005, 5:1–21). Petitioner further contends that, “[t]o the extent Hohnstein does not

explicitly disclose its access system 564 [“monitoring” and “routing” as recited in claim 1], Palmer teaches this limitation.” *Id.* at 59 (citing Petitioner’s discussion in Ground 1); *see id.* at 42–44. According to Petitioner, “[i]t would have been obvious to a POSA to monitor a signal characteristic of the downlink signals to each subscriber unit 26 in Hohnstein and perform routing to the mobile hosts based on such monitored characteristics, to determine when to perform a roaming handoff from one access point to another to maintain a continuous wireless connection, as already discussed above.” *Id.* (citing Ex. 1002, ¶¶ 150–154). Petitioner asserts that the Board, in the prior IPR concluded that Hohnstein discloses the WLAN transceiver “determines” signal characteristics and “transmits” a signal to a first computing device based on the determined signal characteristics.⁷ *Id.* at 59–60 (citing Ex. 1010, 45).

Petitioner contends that a person of ordinary skill in the art would have had a reason to make the proposed combination. *See id.* at 42–44. For example, Petitioner contends that:

A POSA would have recognized that Palmer’s approach of monitoring downlink signal characteristics would have provided the ability in Hohnstein’s access points to determine when to perform a roaming handoff (*e.g.*, diminished wireless connection based on these continuously-measured signal characteristics), a function that Hohnstein already discloses that the access points are responsible for overseeing, and that such handoff determines how downlink signals are routed to

⁷ As indicated above, we focus our analysis on the current Petitioner’s arguments regarding the claims before us, rather than the prior petitioner’s arguments regarding claims of a different patent. *See supra* n.6; *cf.* Prelim. Resp. 44 (Patent Owner arguing that Petitioner’s reliance on the prior IPR is flawed because “the final limitation of Claim 1 of the ’555 Patent differs from the final limitation in Claim 1 of the ’794 Patent.”).

respective mobile devices. A POSA would have appreciated that such monitoring would have allowed Hohnstein's access points 22 to provide a continuous wireless network connection in a transparent fashion, a benefit appreciated in both Hohnstein and Palmer.

Id. at 44 (citing Ex. 1005, 5:19–21; Ex. 1004, 1:58–61, 4:22–26; Ex. 1002 ¶¶ 122–131). Petitioner also contends that a person of ordinary skill in the art would have had a reasonable expectation of success in implementing the monitoring and routing in Hohnstein. *Id.* at 45.

Patent Owner argues that “[t]he Petitioner does not and cannot claim in the Petition that its second transceiver ([Hohnstein's] access point 22) monitors signal characteristics and routes information accordingly because Hohnstein discloses that the subscriber unit monitors the signal.” Prelim. Resp. 43 (citing Ex. 1005, 5:22–29). Patent Owner, relying on its earlier arguments for Ground 1, argues that Petitioner's obviousness theory also fails because Palmer does not disclose a second transceiver monitoring the signal characteristics. *Id.*

Even if Patent Owner is correct that Hohnstein does not disclose the “monitoring” limitation, we, for the reasons given above in the context of Ground 1, have determined that Petitioner has demonstrated a reasonable likelihood of proving that Palmer discloses or at least suggests that limitation. We further determine for this Ground 2 that Petitioner has demonstrated a reasonable likelihood of proving that the combination of Hohnstein and Palmer would have rendered obvious the claimed matter in which “the second transceiver monitors first signal characteristics of the second downlink signal of the first mobile station and monitors second signal characteristics of the second mobile station, and based on the first

signal characteristics and the second characteristics, routes information to the first mobile station and the second mobile station, respectively.”

d. Conclusion as to Independent Claim 1

Having considered the parties’ arguments and evidence, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing in its challenge to claim 1 as obvious over Hohnstein and Palmer.

3. The Remaining Claims Challenged in Ground 2

Claim 5 depends directly from independent claim 1 and recites that “the first wireless transceiver and the second wireless transceiver are part of an integrated device.” Ex. 1001, 10:54–56. Patent Owner states that it does not address Petitioner’s arguments regarding claim 5 “because the Petition wholly fails to describe how Hohnstein discloses the purported first and second transceivers in Hohnstein as an ‘integrated device,’ or any rationale why a person of ordinary skill in the art would have found it obvious to modify Hohnstein accordingly.” Prelim. Resp. 44 n.3 (citing Pet. at 64–65). We disagree with Patent Owner’s argument as Petitioner contends that Hohnstein’s transceivers are integrated in, for example, antenna module 502 as shown in Figure 11. Pet. 64–65 (citing Ex. 1005, 15:13-15; Fig. 11). Petitioner also contends—citing caselaw, the Manual of Patent Examining Procedure (MPEP), expert testimony, and other sources—that, “[a]t the very least, a POSA would have recognized that such integration would have been an obvious variant.” *Id.* at 65 (citing *In re Larson*, 340 F.2d 965, 968 (CCPA 1965); MPEP § 2144.04; Ex. 1002 ¶¶ 168–73; Ex. 1012; Ex. 1013).

Petitioner contends that each of the remaining challenged claims in this ground, independent method claim 6 and dependent claims 2–4, would have been obvious over Hohnstein and Palmer. Pet. 60–63, 66–67. In this

regard, Patent Owner does not raise any arguments regarding Petitioner's contentions beyond those addressed above for independent claim 1.

Having considered the arguments and evidence, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing in its challenge to claims 2–6 as obvious over Hohnstein and Palmer.

F. The Alleged Unpatentability of Claims 1–6 as Obvious over Palmer and Mahany (Ground 3)

Petitioner alleges that claims 1–6 of the '794 patent would have been obvious over Palmer and Mahany. *See* Pet. 67–75. Petitioner contends that, if it is determined that Palmer does not disclose or suggest certain recited features, Mahany teaches them. *Id.* at 70. For example, Petitioner contends that “Mahany discloses a wireless base station topology for a WWAN,” and that “[a] POSA would have found it obvious to configure Palmer's central antenna 32 as a ‘base station’ (*e.g.*, using a cellular network) based on Mahany's teachings, inasmuch as a base-station topology was already well established and commonly utilized in the telecommunications industry.” *Id.* at 71 (citing Ex. 1002 ¶¶ 189–190; Ex. 1006, Figs. 1b-1c, Fig. 45, 63:63–64:5). Petitioner also contends that Mahany discloses or suggests the two distinct protocols recited in the challenged claims, noting that Mahany explicitly discloses LAN and WAN transceiver circuits and protocols. *See id.* at 71–73; *see, e.g.*, Ex. 1006, 59:57–62 (“To control the radio, the control processor 3503 (FIG. 37) accesses the information in the memory 3522 needed for radio setup and operation on a plurality of LANs/WANs. Among other information, the memory 3522 stores: 1) a plurality of software protocols, one for each LAN/WAN to be supported . . .”).

Patent Owner argues that Mahany disparages and teaches away from wide area networks and, therefore, a person of ordinary skill in the art would

not make the proposed combination. *See* Prelim. Resp. 25–31; *see also, e.g., id.* at 30 (“Palmer does not favor WANs in the first instance—it is about LANs—and Palmer does not identify in any regard that it was seeking to improve on a WAN by changing or modifying anything disclosed.”).

Although Mahany does discuss some of the shortcomings of WAN, it is, as Patent Owner acknowledges, in the context of a system that utilizes both LAN and WAN. *See, e.g., id.* at 29 (Patent Owner asserting that “[b]oth Mahany and Palmer describe WAN connections as a less-preferable alternative that is used when out of range of LAN connections (their inventions).”); Ex. 1006, 3:18–20 (Mahany stating that WANs “simply do not provide an effective overall solution.”). We do not agree with Patent Owner’s implied argument that a person of ordinary skill in the art would fail to see the applicability of WAN transceivers and protocols based on Mahany’s statements. We determine that Petitioner has provided an adequate showing at this stage of reasons why a person of ordinary skill in the art would have made the proposed combination. *See* Pet. 71–73 (citing, *inter alia*, Ex. 1002 ¶¶ 189–193).

Patent Owner also argues that “[t]he ‘base station’ in Mahany does not satisfy the ‘base station’ of the ’794 Patent that [purportedly has certain requirements].” *Id.* at 27–29. As mentioned above in the claim construction section, we decline to read into the claims limitations regarding the base station beyond that explicitly recited. Even if, as Patent Owner asserts, Mahany lacks a disclosure of a base station (which is not a structure included in the claimed “wireless communication device”), Patent Owner has not explained adequately why Mahany’s WAN transceiver is not “a first wireless transceiver *operable* to communicate with a base station . . .

according to a wide area wireless communication protocol” (which, along with the second wireless transceiver, is required structure in claim 1).

Ex. 1001, 10:18–22 (emphasis added).

For dependent claim 5, which calls for the two transceivers to be part of an integrated device, Patent Owner argues that the components of the primary reference, Palmer, are geographically remote and a person of ordinary skill in the art would not modify Palmer because “Mahany is about a different device.” Prelim. Resp. 31–32. Patent Owner acknowledges that “Mahany’s access device 4801, which per Mahany’s Fig. 48 includes a LAN transceiver circuit and a WAN transceiver circuit with dotted-line boxes,” but argues that Mahany does not disclose data transfer between WAN and LAN networks. *Id.* at 32. Even if Patent Owner’s characterization of Mahany is correct, we do not agree with Patent Owner’s argument because Patent Owner attacks Petitioner’s showing by arguing the references individually, rather than addressing the combination of teachings relied upon in the Petition. *See In re Merck & Co.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986) (“Non-obviousness cannot be established by attacking references individually where the [challenge] is based upon the teachings of a combination of references.”). Petitioner relies on Mahany for the teaching of a device integrating LAN and WAN transceivers, and, with the support of Dr. Almeroth, provides adequate reasoning for purposes of this decision as to why a person of ordinary skill in the art would have found it obvious to configure the two transceivers as an integrated device. *See* Pet. 70–71, 73–75; Ex. 1002 ¶¶ 182–188.

Having considered the arguments and evidence, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing in its challenge to claims 1–6 as obvious over Palmer and Mahany.

G. The Alleged Unpatentability of Claims 1–4 and 6 as Obvious over Palmer and Agrawal (Ground 4)

Petitioner alleges that claims 1–4 and 6 of the ’794 patent would have been obvious over Palmer and Agrawal. *See* Pet. 75–79. Petitioner contends that, if Palmer is deemed to not disclose or suggest the monitoring and routing being done by the second transceiver, Agrawal describes those features, and Petitioner further contends that a person of ordinary skill in the art would have had a reason to utilize Palmer’s access point 40 to monitor the signal characteristics. *Id.* at 78–79. Petitioner contends, *inter alia*, that “Agrawal’s system monitors the quality of the wireless link between a base station 13 and a mobile unit 14—a receiver monitors signal characteristics such as received signal strength, word-error-rate (‘WER’), and noise or interference level, and a transmitter uses such monitored signal characteristics to control its transmission.” *Id.* at 76 (citing Ex. 1007, 5:24–29). According to Petitioner:

in monitoring a downlink signal (*e.g.*, involving “base station sending data to a mobile receiver [unit]”), the mobile unit monitors the WER and if the WER “increases beyond a predetermined upper limit, . . . the mobile unit advantageously informs the base station” and the base station controls transmissions accordingly. *Id.*, 5:39-44. The transmitter utilizes the monitored signal characteristics to control transmission, including to “set[] the power and the encoding levels.” *Id.*, 5:26-29, 2:58-3:1. For example, in response to a “drop in the channel quality” measured by a mobile unit and conveyed to the base station, the transmitter may change the encoding level. *Id.*, 5:26-29. By increasing the encoding level, the transmitter compensates for the drop in signal quality at the

sacrifice of reduced “throughput of the wireless channel” as a result of requiring “more redundant bits . . . to be transmitted for the same number of information bits.” *Id.*, 2:58-3:1

Id. at 77 (alterations in original).

Patent Owner argues that Agrawal has nothing to do with WANs or LANs and that Agrawal’s system uses a receiver not a transceiver. Prelim. Resp. 33. Patent Owner additionally impliedly argues that Agrawal’s base station (mapped by Petitioner as a monitoring and routing component) is not a “second transceiver,” which is the component that monitors and routes in the claimed invention. *Id.* at 34. We do not agree that Patent Owner’s arguments show flaws in Petitioner’s case. Patent Owner is attacking the references individually, rather than addressing adequately Petitioner’s proposed combination. Petitioner relies on Palmer for the specific components, and turns to Agrawal for the description of “a transceiver (*e.g.*, base station 13) that directly communicates with first and second mobile stations (mobile units 14), and that monitors first signal characteristics of the second downlink signal of the first mobile station and monitors second signal characteristics of the second mobile station.” Pet. 77–78. The general teaching regarding monitoring signals between two components is applicable to Palmer even if those components are not the exact same components in the Palmer or the claimed invention. Also, Patent Owner’s conclusory attorney argument about Agrawal’s base station not being a “transceiver” is inadequate to undermine Petitioner’s showing on that point, and, further, we understand the proposed combination to utilize Palmer’s transceivers.

Patent Owner argues that it is Agrawal’s mobile unit that monitors the signals but, “[i]n Claim 1, the ‘mobile station’ does not monitor the signal

characteristics.” Prelim. Resp. 34. We fail to discern any negative limitation in claim 1 that precludes the mobile station from monitoring signal characteristics. We understand Petitioner to contend that Agrawal’s base station—the component directly communicating wirelessly with the mobile unit and thus analogous to the second transceiver of claim 1—monitors the signal characteristics by receiving information on those characteristics from the mobile unit and then utilizing those characteristics to control transmission. *See* Pet. 77–78. Patent Owner does not explain adequately why that is not monitoring within the meaning of the claim. *See* Ex. 1001, 8:64–9:3 (the ’794 patent discussing an embodiment where “signal characteristics are measured, or otherwise determined, at the mobile station and results of such measures or determinations of are reported back to the WLAN transceiver and appropriate control circuitry,” and, “if appropriate, the handover of communications is effectuated.”).

Patent Owner argues that “the Petitioner does not even allege that Agrawal monitors signal characteristics, and ‘based’ on monitoring signal characteristics routes information accordingly.” Prelim. Resp. 34; *see also id.* at 35 (“[T]he Petition does not allege that Agrawal provides such a teaching [of routing based on signal characteristics].”). We do not agree with Patent Owner’s argument as Petitioner alleges, *inter alia*, that “Palmer and Agrawal both disclose using monitored signal characteristics to determine whether a downlink connection has degraded so as to necessitate reducing the connection’s data rate.” Pet. 78–79. Additionally, Patent Owner again is attacking the references individually where Petitioner relies, at least in part, on Palmer’s routing of information based on characteristics. *See id.*

Having considered the arguments and evidence, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing in its challenge to claims 1–4 and 6 as obvious over Palmer and Agrawal.

H. The Alleged Unpatentability of Claim 5 as Obvious over Palmer, Agrawal, and Mahany (Ground 5), and the Alleged Unpatentability of Claims 1–6 as Obvious over Hohnstein and Agrawal (Ground 6)

Ground 5 challenges only dependent claim 5, the “integrated device” claim, and Petitioner relies on its contentions for Ground 1 (for the limitations of the underlying independent claim) and Ground 3 (for the limitation of claim 5). Pet. 80. Patent Owner similarly relies on its arguments for those grounds. Prelim. Resp. 35.

Ground 6 is similar to Ground 2, with Agrawal replacing Palmer as the secondary reference for teachings regarding the second transceiver monitoring signal characteristics. Pet. 80. Patent Owner does not present separate arguments for Ground 6, but rather relies on its earlier arguments. See Prelim. Resp. 44–45.

For the reasons discussed above, Petitioner has shown a reasonable likelihood that at least one claim of the ’794 patent is unpatentable under at least one ground. Having decided to institute as to at least one challenged claim, we institute on all challenged claims and on all asserted grounds. The parties may address further during trial any disputed issues pertaining to Grounds 5 and 6.

IV. CONCLUSION

Petitioner has demonstrated a reasonable likelihood of prevailing in showing the unpatentability of at least one of the challenged claims of the ’794 patent. Accordingly, we institute an *inter partes* review on all challenged claims on all asserted grounds. See *SAS Inst. Inc. v. Iancu*, 138

S. Ct. 1348, 1354, 1359–60 (2018); 37 C.F.R. § 42.108(a) (“When instituting *inter partes* review, the Board will authorize the review to proceed on all of the challenged claims and on all grounds of unpatentability asserted for each claim.”). At this stage of the proceeding, we have not made a final determination with respect to the construction of any claim term or with respect to the patentability of any of the challenged claims.

V. ORDER

For the foregoing reasons, it is

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review of claims 1–6 of the ’794 patent is instituted with respect to all grounds of unpatentability set forth in the Petition; and

FURTHER ORDERED that, pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4(b), *inter partes* review of the ’794 patent shall commence on the entry date of this Order, and notice is hereby given of the institution of a trial.

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