

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

EMERSON ELECTRIC CO.,
Petitioner,

v.

SIPCO, LLC,
Patent Owner.

Case IPR2017-00001
Patent 7,468,661 B2

Before PATRICK M. BOUCHER, STACEY G. WHITE, and
ROBERT J. WEINSCHENK *Administrative Patent Judges*.

BOUCHER, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

In response to a Petition (Paper 2, “Pet.”) filed by Emerson Electric Co. (“Petitioner”), we instituted an *inter partes* review of claims 5, 6, and 8 of U.S. Patent No. 7,468,661 B2 (“the ’661 patent”). Paper 7 (“Dec.”), 25. We denied Petitioner’s Request for Rehearing (Paper 9) of our decision not to institute review on other grounds advanced in the Petition. Paper 12.

During the trial, SIPCO, LLC (“Patent Owner”) filed a Response (Paper 13, “PO Resp.”) to which Petitioner filed a Reply (Paper 25, “Reply”). An oral hearing was held on December 8, 2017, and a copy of the transcript was entered into the record. Paper 46 (“Tr.”). Subsequent to the hearing, pursuant to our authorization, the parties submitted briefing to address construction of a phrase recited in the claims, which we address below. Papers 42, 44, 45.

We have jurisdiction under 35 U.S.C. § 6. This Decision is a Final Written Decision under 35 U.S.C. § 318(a) as to the patentability of the claims on which we instituted trial. Based on the record before us, Petitioner has shown, by a preponderance of the evidence, that claims 5 and 6 are unpatentable.

I. BACKGROUND

A. The ’661 Patent

The ’661 patent claims the benefit of several earlier filing dates through a series of continuation and continuation-in-part applications. Ex. 1001 at [63]. Petitioner contends that the claims for which we instituted

review are “only entitled to March 18, 1999” as an effective filing date. Pet. 5, 6. Because Patent Owner does not contest the availability of any of the references involved in the challenges for which we instituted review, we do not address the effective filing date of the challenged claims.

The '661 patent relates to “a computerized system for monitoring, reporting on, and controlling remote systems by transferring information signals through a wide area network (WAN) and using software applications hosted on a connected server to appropriately process the information.” Ex. 1001, col. 1, ll. 34–38. Figure 2 of the '661 patent is reproduced below.

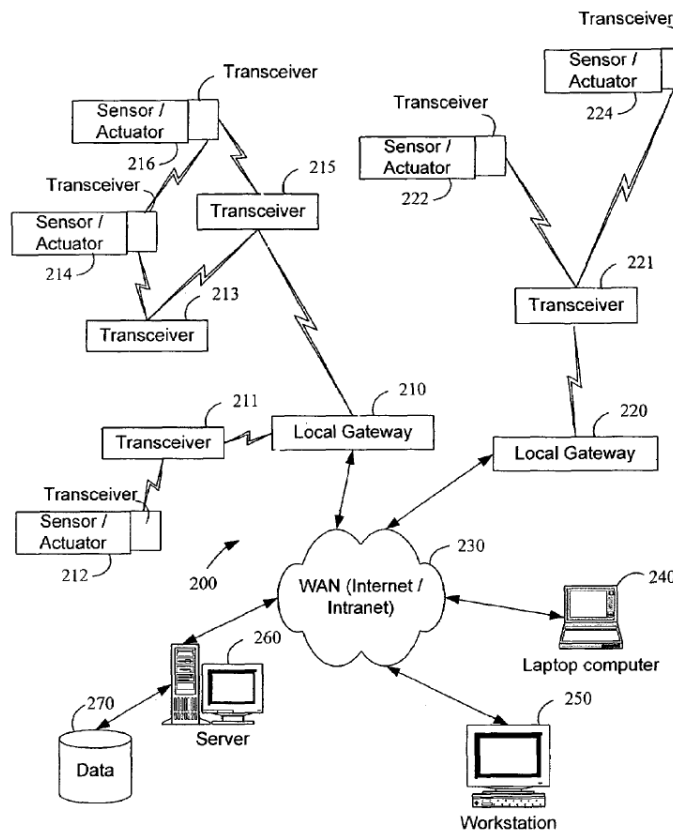


FIG. 2

Figure 2 is a block diagram that illustrates a control system. *Id.* at col. 5, ll. 50–53. Control system 200 includes one or more sensor/actuators 212, 214, 216, 222, and 224 that are integrated with a transceiver, as well as stand-alone transceivers 211, 213, 215, and 221. *Id.* at col. 5, ll. 53–55, col. 6, ll. 3–4. Each of the stand-alone and integrated transceivers may be configured to receive an incoming radio-frequency (“RF”) transmission and to transmit an outgoing signal, which may be an RF or other type of signal. *Id.* at col. 6, ll. 4–12.

Local gateways 210 and 220 receive data transmissions from the various stand-alone or integrated transceivers, analyze the received transmissions, convert the transmissions to TCP/IP format, and communicate the transmissions via WAN 230. *Id.* at col. 6, ll. 25–28. The local gateways may communicate information, service requests, control signals, etc., to remote sensor/actuator transceiver combinations from server 260, laptop computer 240, and workstation 250 across WAN 230. *Id.* at col. 6, ll. 28–33.

Notably, each transmitter may be configured to have a unique “transmitter identification number” that identifies the transmitter to the function blocks of control system 200. *Id.* at col. 8, ll. 32–35. As examples, the ’661 patent discloses implementing such a transmitter identification number with an EPROM so that it is electrically programmable, or allowing the transmitter identification number to be configured through a series of DIP switches. *Id.* at col. 8, ll. 35–39. The integrated transceivers transmit to

the standalone transceivers a data packet that includes a “function code” as well as the transmitter identification number. *Id.* at col. 8, ll. 51–53. The Specification explains that, to generate such “function codes,” a “lookup table” may be provided in connection with a data formatter so that “a given and unique function code [is assigned] for each button pressed.” *Id.* at col. 8, l. 64–col. 9, l. 1. For example different “function codes” may be assigned to identify a party pressing a transmit button, to identify an emergency button, or “as necessary to accommodate additional functions or features of a given transmitter.” *Id.* at col. 9, ll. 1–11.

A standalone transceiver that receives a data packet from an integrated transceiver forms its own data packet by concatenating the received data packet with its own identification code and its own specific function codes. *Id.* at col. 10, ll. 41–43. The data packet is then transmitted from the standalone transceiver to the gateway and through the WAN to the server. *Id.* at col. 12, ll. 5–13.

The Specification of the ’661 patent discloses a number of different uses by the server for information recorded with such data packets. “[T]he transmitter identification number may be used to access a look up table that identifies, for example, the person assigned to carry that particular transmitter,” and that may include “a physical description, and/or any other information that may be deemed appropriate or useful under the circumstances or implementation of the particular system.” *Id.* at col. 8, ll. 53–62. The Specification also discloses using the information to

triangulate or otherwise assess circumstances in which multiple local gateways 210 and 220 “receive multiple versions of the same data transmission signal from an integrated transceiver, but from different stand-alone transceivers.” *Id.* at col. 7, ll. 8–16. “Due to the transmitting device identification that is incorporated into the transmitted signal, duplicative transmissions (e.g., transmissions duplicated to more than one gateway, or to the same gateway, more than once) may be ignored or otherwise appropriately handled.” *Id.* at col. 7, ll. 16–20.

B. Illustrative Claim

Independent claim 5 is illustrative of the claims for which we instituted review:

5. A system for monitoring remote devices, comprising:
 - at least one sensor adapted to generate an electrical signal in response to a physical condition;
 - at least one wireless transmitter electrically interfaced with the sensor and configured to encode the electrical signal, the wireless transmitter further configured to transmit the encoded electrical signal and transmitter identification information in a radio-frequency (RF) signal;
 - one or more additional wireless transmitters each electrically interfaced with a sensor and configured to receive the RF signal and retransmit the RF signal;
 - at least one gateway connected [to] a wide area network (WAN) configured to receive and translate the retransmitted RF signal, the gateway further configured to deliver the encoded electrical signal and transmitter identification information to a computer on the WAN; and

a computer configured to execute at least one computer program that formats and stores select information responsive to the electrical signal for retrieval upon demand from a remotely located device.

Ex. 1001, col. 19, ll. 14–33.

C. Instituted Ground of Unpatentability

Petitioner relies on the following references. Pet. 7–12.

Cunningham	US 6,124,806	Sept. 26, 2000	Ex. 1006
Mason	US 6,100,817	Aug. 8, 2000	Ex. 1007
Shuey	US 5,874,903	Feb. 23, 1999	Ex. 1008

We instituted trial with respect to whether claims 5, 6, and 8 are unpatentable under 35 U.S.C. § 103(a) over Mason, Cunningham, and Shuey. Dec. 25.

D. Real Parties in Interest

In addition to itself, Petitioner identifies Fisher-Rosemount Systems, Inc., Rosemount, Inc., and Emerson Process Management LLP as real parties in interest. Pet. 1. In a notice filed on February 9, 2018, Patent Owner “notifies the Board that it is now wholly owned by Glocom, Inc.” Paper 47. Prior to such notification, Patent Owner identified only itself as a real party in interest. See Paper 4.

E. Related Proceedings

The parties identify the following judicial proceedings as involving the '661 patent: (1) *Emerson Electric Co. v. SIPCO LLC*, No. 1:15-cv-319 (N.D. Ga.); (2) *SIPCO, LLC v. Emerson Electric Co.*, No. 6:15-cv-907 (E.D. Tex.), transferred to the Northern District of Georgia, opened as *SIPCO, LLC v. Emerson Electric Co.*, No. 1:16-cv-02690 (N.D. Ga.), and consolidated with 1:15-cv-319 (N.D. Ga.); and (3) *SIPCO, LLC v. Streetline, Inc.*, No. 1:16-cv-00830 (D. Del.). Paper 30, 2; Paper 47, 2. The parties previously identified *SIPCO, LLC v. Acuity Brands, Inc.*, No. 1:16-cv-00480 (D. Del.) as involving the '661 patent, but that matter appears to have been closed. Pet. 2; Paper 4, 2.

The parties also identify the '661 patent as having been the subject of a final written decision in IPR2014-00751, in which claims 2–4 were held unpatentable. Pet. 2; Paper 4, 2.

In addition, patents related to the '661 patent are the subject of CBM2016-00095, IPR2015-01973, IPR2016-00984, IPR2016-01895, IPR2017-00216, and IPR2017-00359, some of which have concluded with a final written decision and been appealed to the Federal Circuit. Paper 30, 2; Paper 47, 2–3.

II. ANALYSIS

A. *Claim Construction*

The Board interprets claims of an unexpired patent using the broadest reasonable construction in light of the specification of the patent in which they appear. *See* 37 C.F.R. § 42.100(b); *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016) (upholding the use of the broadest reasonable interpretation standard); Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,766 (Aug. 14, 2012).

In their initial briefing, neither party proffered any explicit claim construction, and the parties agreed that “the claim terms can be given their ordinary and customary meaning.” Pet. 7; PO Resp. 14. Nevertheless, after the oral hearing, we identified a potential claim-construction issue involving “encoded electrical signal,” and authorized the parties “to brief the issue and to propose an express construction of the phrase ‘encoded electrical signal’ according to . . . the broadest reasonable interpretation in light of the specification.” Paper 40, 2.¹

Independent claim 5 recites that at least one wireless transmitter is “configured to encode” an electrical signal generated in response to a physical condition. Ex. 1001, col. 19, ll. 15–18. The claim further recites that the wireless transmitter is “configured to transmit the encoded electrical

¹ Our Order did not authorize the parties “to file testimonial evidence in support of their respective briefs beyond that already of record in the proceeding.” Paper 40, 2. Petitioner objects to this preclusion “[t]o the extent the Board adopts Patent Owner’s new construction.” Paper 42, 5 n.1.

signal and transmitter identification in a radio-frequency (RF) signal” and that “at least one gateway connected to a wide area network (WAN) [is] configured to deliver the encoded electrical signal and transmitter identification information to a computer on the WAN.” *Id.* at col. 19, ll. 19–21, 25–29.

In their post-hearing briefing, both parties continue to advocate for construction of the term “encoded electrical signal” in accordance with its ordinary and customary meaning, consistent with the positions taken in their initial briefing. Paper 42, 1 (Petitioner advocating that “[t]he ordinary and customary meaning of the term under the broadest reasonable interpretation (BRI) consistent with the specification should apply”); Paper 44, 1 (Patent Owner advocating that “[u]nder the broadest reasonable construction standard, claim terms are given their ordinary and customary meaning, as would be understood by one of ordinary skill in the art in the context of the entire disclosure”). Under this standard, Petitioner proposes that “encoded electrical signal” be construed as “coded information representing the electrical signal generated by the sensor.” Paper 40, 2. Petitioner contends that, under its proposed construction, “‘encoding’ is not limited to ‘function codes,’” as described *supra* in our summary of the ’661 patent because such “function codes” are mere examples. Paper 42, 3–4. Rather, Petitioner asserts that “any code may be used,” and supports this position by identifying disclosure in the ’661 patent that “[a]s long as the code was understood by server 260 or workstation 250 . . . the target parameter could

be monitored with the present invention.” *Id.* at 3; Ex. 1001, col. 9, ll. 46–52.²

Patent Owner’s proposed construction of “encoded electrical signal” is similar: “a code generated from an electrical signal that was generated by a sensor from a physical condition.” Paper 44, 1. In this respect, we agree with Petitioner that, in its post-hearing briefing, Patent Owner “now concedes the [broadest reasonable interpretation] is not limited to ‘function codes’—abandoning the contrary position that [Patent Owner] took at the oral hearing.” Paper 45, 1 (citing Paper 44, 1; Paper 42, 1–2)). Rather, Patent Owner contends that Petitioner’s proposed construction improperly encompasses an “RF protocol conversion” when applied to the prior art, and that its own proposal does not. Paper 44, 2. According to Patent Owner, “all of the intrinsic evidence indicates that the encoded electrical signal is

² Petitioner further observes that “during the Oral Hearing, [Patent Owner] repeatedly referred to ‘function codes’ as mere ‘examples.’” Paper 42, 3. Petitioner does not cite to specific assertions by Patent Owner made during the oral hearing, but the transcript for the hearing was made of record only after the parties’ claim-construction briefs were filed. Nevertheless, we find Petitioner’s characterization of Patent Owner’s argument at the hearing accurate. See Tr. 19:13–16 (“So, if you look at figure 3D there are examples of codes in box 325 and the codes can follow and go in each direction. They can be a code that’s sent to an actuator, for example, or they can be a code that’s read from a sensor, for example.”), 23:10–13 (“Yes, I would say that this is the way that that encoding works because it’s an explicit example right in figure 3D which matches up with the claims. That’s what’s meant by an electrically encoded signal as recited in Claim 5.”).

created prior to being included within a radio frequency (RF) signal for transmission.” *Id.*

Patent Owner’s argument relates more to application of the construction against the prior art than it does to construction of the term itself. Patent Owner’s proposed construction, like Petitioner’s, does not, on its face, exclude RF protocol conversion. In this respect, we agree with Petitioner that Patent Owner is improperly attempting to read in additional limitations that go beyond claim 5’s broad recitation of a “transmitter . . . configured to encode the electrical signal.” See Paper 45, 3. As Petitioner further observes, the Specification of the ’661 patent refers interchangeably to data controller 324 (shown in Figures 3A–3E, not reproduced here) as “data *formatter* 324” (emphasis added), which “operates to form concise data packets.” *Id.*; Ex. 1001, col. 8, ll. 49–51. Petitioner’s proposed construction is thus consistent with the Specification.

Patent Owner agrees that data controller 324 “encodes a physical condition into a function code,” but emphasizes that it does so “before getting converted by the RF transmitter.” Paper 44, 3. The distinction Patent Owner relies on to exclude RF protocol conversion from its proposed construction would improperly narrow the scope of the claim by implicitly adding a limitation that has no express basis in the claim. *In re Prater*, 415 F.2d 1393, 1404–05 (CCPA 1969) (“Nevertheless, ‘reading a claim in the light of the specification,’ to thereby interpret limitations explicitly recited in the claim, is a quite different thing from ‘reading limitations of the

specification into a claim,’ to thereby narrow the scope of the claim by implicitly adding disclosed limitations which have no express basis in the claim.”).

Having thus considered the parties’ positions, we adopt Petitioner’s proposed construction of “encoded electrical signal” as “coded information representing the electrical signal generated by the sensor.” We address application of this construction to the prior art in the analysis below.

B. Legal Principles

A claim is unpatentable for obviousness 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) when in evidence, objective indicia of non-obviousness, i.e., secondary considerations. *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*, 550 U.S. at 418 (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)).

To prevail on its challenges, Petitioner must demonstrate by a preponderance of the evidence that the claims are unpatentable. 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d). “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 never shifts to Patent Owner. *See Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (citing *Tech. Licensing Corp. v. Videotek, Inc.*, 545 F.3d 1316, 1326–27 (Fed. Cir. 2008)) (discussing the burden of proof in *inter partes* review). Furthermore, Petitioner does not 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).

C. Level of Skill in the Art

Petitioner contends that a person of ordinary skill in the relevant art “is a person who has, through formal education or practical experience, the equivalent of a Bachelor’s Degree in Electrical Engineering and 2-3 years of experience in the development and design, or technical marketing, of radio communications or computer network systems.” Pet. 12 (citing Ex. 1002 ¶ 6). Petitioner supports its contention with testimony of Patrick W. Kinney, who additionally asserts that “[a] person having this background would understand how to design and build a wireless, multi-hop communications system for monitoring and controlling remote devices.” Ex. 1002 ¶ 6.

Patent Owner does not advocate for a specific level of skill in its Response, but its expert, Kevin C. Almeroth, Ph.D., articulates a level of skill similar to Petitioner’s proposal. Ex. 2009 ¶ 75. Specifically, Dr. Almeroth opines that a person of ordinary skill “would have the equivalent of a four-year degree from an accredited institution (usually denoted as a B.S. degree) in computer science, computer engineering or the equivalent and experience with, or exposure to, computer networks and routing.” *Id.* In addition, according to Dr. Almeroth, a person of ordinary skill “would also have approximately two years of professional experience with computer networking, routing, and wireless networks. *Id.* And “[a]dditional graduate education could substitute for professional experience, while significant experience in the field might substitute for formal education.” *Id.*

Given the similarity of articulations by the respective experts, and because our Decision does not depend on nuanced distinctions of the level of skill in the art, we adopt Dr. Almeroth's more detailed articulation, but include electrical engineering as an additional alternative educational background, as indicated by Mr. Kinney.

D. Scope and Content of the Prior Art

1. Mason

Mason discloses an automatic meter-reading system compatible with Consumer Electronics Bus protocol EIA IS-60 ("CEBUS"). Ex. 1007, col. 1, ll. 5–6. Figure 1 of Mason is reproduced below.

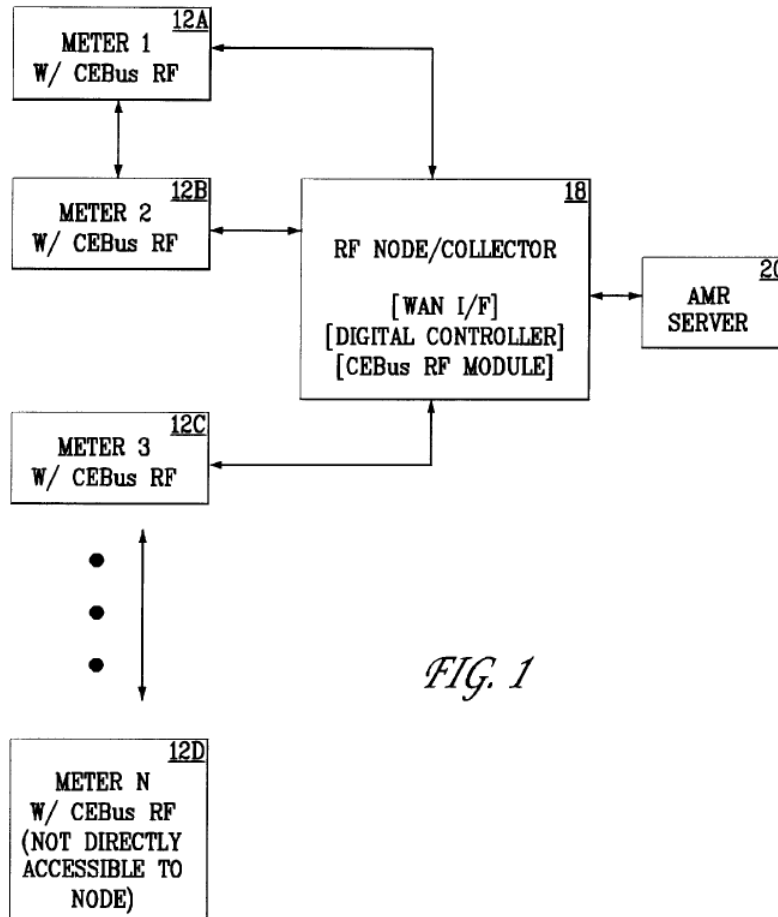


FIG. 1

Figure 1 depicts an automatic meter-reading system that includes a plurality of utility meters 12A, 12B, 12C, . . . , 12D for measuring electricity, gas, or water. *Id.* at col. 5, ll. 33–35. Each meter has a corresponding CEBUS RF module with a transceiver for exchanging RF communications with node 18 and for communicating with a CEBUS local area network within the residence or business with which the meter is associated. *Id.* at col. 5, ll. 36–41, col. 16, ll. 57–65. Node 18 preferably includes a wide area network interface, a digital controller, and a CEBUS RF module, and is coupled with automatic meter-reading (“AMR”) server 20. *Id.* at col. 5, ll. 41–43, col. 6,

ll. 28–29. TCP and IP protocols may be used for communications among AMR server 20 and multiple nodes 18. *Id.* at col. 6, ll. 3–7.

In Figure 1, meter 12D differs from meters 12A–12C in that it is considered “inaccessible” with respect to responsible node 18. By operating another meter within the network as a repeater, such as meter 12C, such an inaccessible meter may still be contacted. *Id.* at col. 6, ll. 27–35. In addressing this aspect, Mason refers specifically to Shuey, discussed more fully below, as “teach[ing] a way to make the RF system adaptive to read hard to access meters within the network, by permitting any meter in the network to operate as a repeater.” *Id.* at col. 6, ll. 23–26.

2. Shuey

Shuey discloses “a utility meter that is capable of serving as a wireless repeater in an automatic meter reading (AMR) network.” Ex. 1008, col. 1, ll. 16–19. Figure 5 of Shuey is reproduced below.

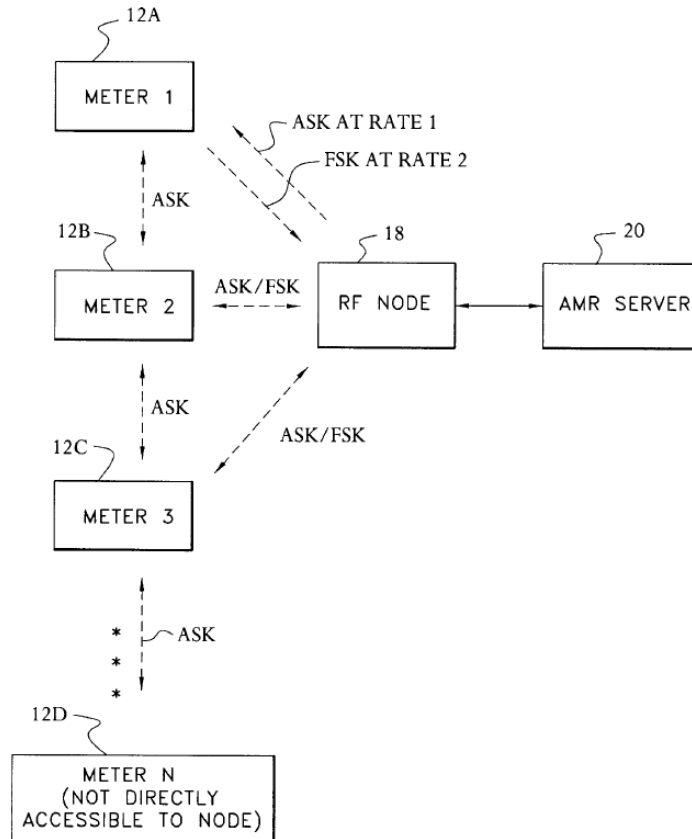


FIG. 5

Figure 5 is a block diagram of an AMR system using repeaters. *Id.* at col. 2, ll. 66–67. The drawing is plainly similar to Figure 1 of Mason, and shows a plurality of meters 12A, 12B, 12C, and 12D, with meter 12D considered “inaccessible” (i.e., “difficult to reach by direct RF communications”) with respect to responsible node 18, which is coupled to AMR server 20. *Id.* at col. 5, ll. 4–17. With a single-level or two-level repeat scheme, a message may be transmitted from the node to the inaccessible meter, i.e., by using

one or two intermediate meters to repeat the message. *Id.* at col. 6, l. 60–col. 7, l. 48.

3. *Cunningham*

Cunningham “is directed to the fields of automatic meter reading of electric, gas, water meters and other systems, automatic reading of flow data, monitoring of such usage, and distribution of information thereon.” Ex. 1006, col. 1, ll. 15–18. Figure 1 of Cunningham is reproduced below.

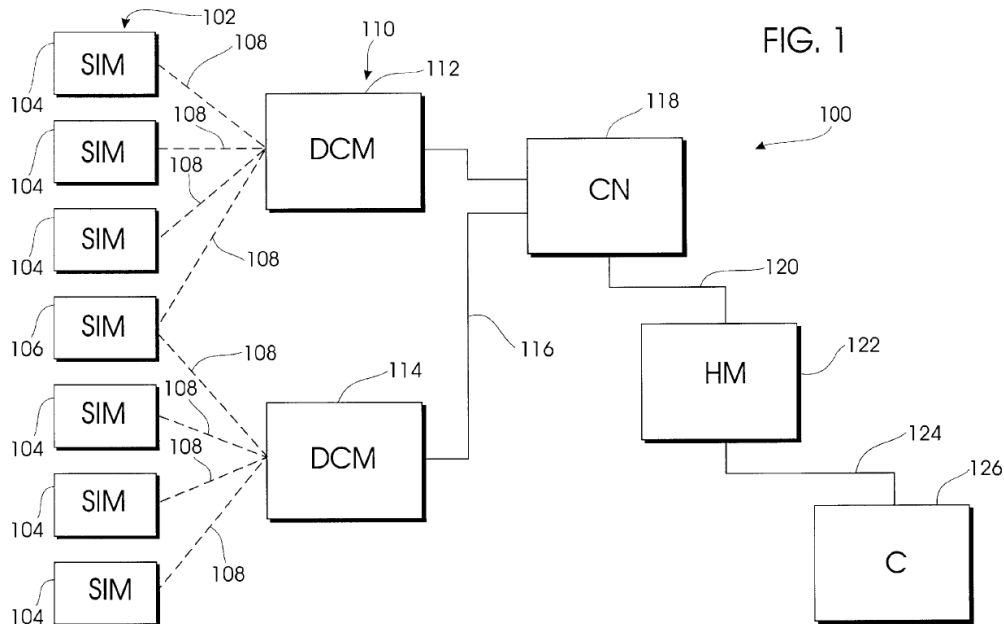


Figure 1 “is a schematic representation for a wide-area remote telemetry system” that acts as a “general monitoring system.” *Id.* at col. 5, ll. 2–5, col. 6, ll. 6–8. Sensor interface modules 102, “which are electromechanical interfaces,” act as data-gathering equipment, and “attach to gas, electric and water meters and other types of monitored equipment.” *Id.* at col. 6, ll. 8–

10, col. 7, ll. 32–34. The sensor interface modules communicate with data collection modules 110, which transmit the received information to network system 118. *Id.* at col. 6, ll. 11–18, col. 7, ll. 19–21. Network system 118 forwards the transmitted information to host module 122, where the information is stored or processed. *Id.* at col. 7, ll. 21–24. The stored or processed information may then be transmitted to customer interface 126. *Id.* at col. 7, ll. 24–27.

E. Differences Between the Claimed Subject Matter and the Prior Art

1. Independent Claim 5

In addressing independent claim 5, Petitioner draws a general correspondence between the structural elements recited in the claimed “system for monitoring remote devices” and the structure of Mason’s automatic meter-reading system. Pet. 60–65. This mapping is supplemented through further identification of disclosure from Mason, Shuey, and Cunningham as corresponding to functional aspects of the claim. *Id.*

a. “at least one sensor”

In addressing the “at least one sensor adapted to generate an electrical signal in response to a physical condition,” Petitioner identifies Mason’s remote utility meters 12, each of which is operable to detect a physical condition (i.e., a measurement of electricity, gas, or water) and to generate a responsive electrical signal that is used by its corresponding RF module. *Id.*

at 60–61 (citing Ex. 1007, col. 5, ll. 32–41, col. 9, ll. 56–65, col. 15, ll. 37–47, col. 15, ll. 49–53; Ex. 1002 ¶ 117). Patent Owner does not dispute this identification. *See generally* PO Resp.

b. “at least one wireless transmitter”

In addressing the “at least one wireless transmitter” limitation, Petitioner identifies the transmitter function of transceivers integrated with Mason’s RF modules, which are thereby “electrically interfaced with the sensor,” as recited in the claim. *Id.* at 61. Petitioner contends that such a wireless transmitter is “configured to encode the electrical signal,” as also recited in the claim, because, in Mason, “communications from a meter 12 use the CEBUS protocol, including meter data that adheres to the ANSI C12.18 protocol.” *Id.* (citing Ex. 1007, col. 6, ll. 8–13, col. 9, l. 37–col. 10, l. 23, col. 13, l. 13–col. 15, l. 20). Petitioner reasons that a person of skill in the art “would understand that Mason’s transmitter, which is called a ‘CEBUS RF board’, encodes the electrical signal it receives from the sensor, so that communications can be made using the CEBUS and ANSI C12.18 protocols.” *Id.* Although not cited in the Petition, Petitioner’s expert, Mr. Kinney, makes the same statement. Ex. 1002 ¶ 119.

We find Petitioner’s reasoning on this point persuasive under the construction of “encoded electrical signal” that we adopt. That is, Mason’s CEBUS packet, which is generated in accordance with the ANSI meter protocol, and which “contains the specific data for a given meter or meters,”

is “coded information representing the electrical signal generated by the sensor.” *See* Ex. 1007, col. 6, ll. 10–13. Nevertheless, we note that we would reach the same conclusion under Patent Owner’s proposed construction of “encoded electrical signal,” absent Patent Owner’s additional improper carve-out of “RF protocol conversion.” That is, we find that Mason’s CEBUS packet is also “a code generated from an electrical signal that was generated by a sensor from a physical condition.”

With respect to the additional limitation that the wireless transmitter is “further configured to transmit the encoded electrical signal and transmitter identification information in a radio-frequency (RF) signal,” we also find that Petitioner makes a sufficient showing. Petitioner observes that, in Mason, a message received by a first meter from a second meter operating as a repeater includes a Source House Code field and a Source Address field. Pet. 56 (citing Ex. 1007, col. 7, ll. 19–31).³ When the Source Address field is nonzero, the second meter acts as a repeater to transfer a message between the node and the end meter, with the Source Address field holding information used to identify the second meter. *Id.* (citing Ex. 1007, col. 7,

³ Petitioner makes this observation when addressing independent claim 1, upon which we did not institute review. Nevertheless, the Petition is structured such that certain contentions made in the context of addressing claim 1 inform Petitioner’s arguments with respect to independent claim 5. In other instances, when addressing the grounds upon which we instituted review, the Petition also incorporates arguments made for grounds upon which we did not institute review. We do not highlight every such instance below, but cite to where the Petition makes the argument.

ll. 26–31, col. 10, ll. 28–34). Petitioner contends that this information in the Source Address field corresponds to the “transmitter identification information” recited in independent claim 5. *Id.* at 56–57; *see id.* at 61–62. We agree with this contention. As Petitioner asserts, “the CEBUS RF board in a meter 12 transmits in an RF signal a meter response message that . . . includes, among other things, meter data that adheres to the ANSI C12.18 protocol and the meter’s unique address.” *Id.* at 61–62 (citing Ex. 1007, col. 5, ll. 35–41, col. 6, ll. 8–15, col. 9, l. 37–col. 10, l. 23, col. 11, ll. 11–13, col. 13, l. 13–col. 15, l. 20; Ex. 1002 ¶¶ 118–120).

c. “one or more additional wireless transmitters”

Third, Petitioner combines the teachings of Shuey with those of Mason in addressing claim 5’s recitation of “one or more additional wireless transmitters.” *Id.* at 62–63. The claim requires that each such additional wireless transmitter is “electrically interfaced with a sensor and configured to receive the RF signal and retransmit the RF signal,” i.e., to act as a repeater. Ex. 1001, col. 19, ll. 22–24. As discussed above, Mason discloses that meter 12D is considered “inaccessible” with respect to node 18, and that another meter within the network may act as a repeater so that the inaccessible meter may still be contacted. *Id.* at col. 6, ll. 27–35. Petitioner cites Shuey for details regarding the information included in retransmission by meters acting as repeaters, and provides sufficient reason to effect the combination in light of Mason’s explicit reference to Shuey: “A POSITA

would have been motivated to incorporate into Mason's system Shuey's teaching of a repeater that retransmits all of the claimed information, because Mason explicitly notes that Shuey's system is a system for which Mason's invention is particularly suited." Pet. 58–59 (citing Ex. 1007, col. 6, ll. 35–38; Ex. 1002 ¶¶ 110–112). Petitioner's reasoning is thus supported by sufficient rational underpinning. *KSR*, 550 U.S. at 418.

d. "at least one gateway"

Petitioner addresses claim 5's recitation of "at least one gateway" by relying on "Mason[] alone or in combination with Cunningham." Pet. 63–64. In doing so, Petitioner refers to its analysis of a related limitation of claim 1, upon which we did not institute review. *Id.* at 63 ("As detailed above in the analysis of claim element [1d]"), 64 ("for these additional reasons and the reasons provided above in the analysis for claim element [1d]"). That analysis draws a correspondence between the recited "gateway" and Mason's RF node 18, which Petitioner observes "is connected to a WAN through a WAN interface." *Id.* at 59. Petitioner further reasons that the signal received by Mason's RF node 18 is a "retransmitted RF signal," as recited in claim 5, in accordance with the repeater functionality disclosed by Mason and discussed above in connection with the recited "one or more additional wireless transmitters." *Id.* at 63. We agree with these aspects of Petitioner's analysis, which are not contested by Patent Owner.

With respect to the further requirement of claim 5 that the gateway be “configured to deliver the encoded electrical signal and transmitter identification information to a computer on the WAN,” Petitioner makes two points. First, Petitioner contends that Mason’s AMR server 20 corresponds to the recited “computer,” and that a person of skill in the art “would understand that the node 18 must translate messages in the CEBUS RF protocol received from meters 12 into TCP/IP protocol for transmission to AMR server 20 over the WAN.” *Id.* at 59–60 (citing Ex. 1002 ¶¶ 113–114). Petitioner supports this contention with testimony by Mr. Kinney. Ex. 1002 ¶¶ 113–114.

Second, Petitioner contends that “the packets retransmitted by Mason and Shuey include all of the information that comprises the claimed ‘retransmitted RF signal,’ including the encoded electrical signal and transmitter identification information.” *Id.* 63–64. We agree with these contentions, particularly in light of Mason’s detailed disclosure of message formatting using TCP/IP to implement communications between the node and server, and how such TCP/IP communications continue to include information formatted according to the CEBUS protocol. *See* Reply 4–6; Ex. 1007, col. 6, l. 1–col. 7, l. 17.

Patent Owner responds with an untenable parsing of the claim language. Patent Owner asserts that “[c]laim 5 requires that a gateway be ‘further configured to deliver the **encoded electrical signal** . . . to a computer’ and ‘a computer configured to execute at least one computer

program that formats and stores select information responsive to the electrical signal for retrieval upon demand from a remotely located device.” PO Resp. 19–20 (quoting Ex. 1001, col. 19, ll. 27–34) (emphasis and ellipsis by Patent Owner). In quoting the claim language, Patent Owner omits the claim’s recitation of “and transmitter identification information” in supporting its contention that “the encoded electrical signal has to be received by the gateway and then delivered to the computer; what is transmitted to the computer cannot be a signal representing aggregated information.” *Id.* at 20. But a plain reading of the claim does not support such a contention because the claim’s language does not exclude an aggregated encoded electrical signal and transmitter identification information. Furthermore, the Specification of the ’661 patent explains that “[d]ata controller 324 assembles data packet 332 *by concatenating* received data packet 330 with its own transceiver identification code 326 and its own specific function codes.” Ex. 1001, col. 10, ll. 41–43.

Nor is Patent Owner’s contention persuasive that Mason is “related to the sending of information from [the] server to the sensors, not the reverse.” PO Resp. 20. Rather, we agree with Petitioner that Patent Owner’s contention “is belied by Mason’s express disclosure” of how information is formatted to communicate meter reading data and identification information from the meter to the node to the server. *See* Reply 1–8. In addition to identifying express disclosure in Mason of integrating the CEBUS protocol in an automatic meter-reading network with TCP/IP protocols for

communicating over a WAN, Petitioner cites relevant testimony of Mr. Kinney that was provided with the Petition, as well as testimony provided in a Rebuttal Declaration. *Id.*; Ex. 1002 ¶¶ 110–114, 116, 121–124; Ex. 1046 ¶¶ 10–15. Through his testimony, Mr. Kinney explains that one of ordinary skill in the art would understand Mason to disclose “sending information both from the server to the sensors and from the sensors to the server.” Ex. 1046 ¶ 10. We credit this testimony.

Accordingly, we conclude that Petitioner demonstrates that the “at least one gateway limitation” is disclosed by Mason alone. We also conclude that Petitioner sufficiently establishes its alternative position that the combination of Mason and Cunningham discloses the limitation.

Petitioner advances this alternative position by asserting that “to the extent the Board does not believe that Mason’s node 18 performs a translation, Cunningham teaches this feature as explained above in the analysis” for a ground on which we did not institute review. Pet. 60 n.11. In that analysis, Petitioner identifies “at least one” of Cunningham’s data collection modules as the recited “gateway.” *Id.* at 27–28. Petitioner observes that, in Cunningham, a data collection module operable to receive information from a sensor interface module, not in TCP/IP format, is also operable to send received information to the host module as a TCP/IP signal. *Id.* (citing Ex. 1006, col. 7, ll. 19–21, col. 14, ll. 12–61, col. 29, l. 63–col. 30, l. 65, col. 45, ll. 60–67). “Because information from a sensor interface module is in a format other than TCP/IP when first received by a data

collection module, but later sent to the host module as a TCP/IP signal, a POSITA would understand that the data collection module translates the sensor interface module information into a TCP/IP signal.” *Id.* at 28.

Petitioner reasons that a person of ordinary skill in the art would have been motivated to incorporate the teachings of Cunningham into Mason such that Mason’s AMR server makes its stored data available for retrieval upon demand from a remotely located device, because providing the ability for remote computers to access centrally located data, instead of forcing multiple users to physically visit one computer that hosts data, makes it easier to provide data to multiple people.

Id. at 54; *see also* Ex. 1002 ¶ 104. Such reasoning includes sufficient rational underpinning to support Petitioner’s reason for effecting the combination. *KSR*, 550 U.S. at 418. Patent Owner challenges this rationale because it “does not relate to the claimed gateway.” PO Resp. 23. And Patent Owner contends that “Petitioner has failed to provide any motivation to combine . . . Mason and Cunningham to achieve a gateway ‘further configured to deliver the encoded electrical signal and transmitter identification information to a computer on the WAN.’” *Id.* at 22.

But Petitioner’s reasoning must necessarily be considered in the limited context for which it applies Cunningham. As Petitioner emphasizes in its Reply, it relies on Mason, rather than Cunningham, for the delivery of the encoded electrical signal and transmitter identification information to a computer on the WAN. Reply 8. We agree with Petitioner that the Petition instead relies on Cunningham for disclosure of (1) a gateway that performs a

translation and (2) formatting and storing information for retrieval upon demand from a remotely located device. *Id.* In this more limited context, Petitioner’s articulated rationale is pertinent. Accordingly, we conclude that Petitioner sufficiently demonstrates the translation aspect of the “at least one gateway” limitation through its articulated combination with Cunningham.

e. “a computer”

As noted above, Petitioner draws a correspondence between Mason’s AMR server 20 and claim 5’s recitation of a “computer.” Pet. 53. According to the claim, the computer is “configured to execute at least one computer program that formats and stores select information responsive to the electrical signal for retrieval upon demand from a remotely located device.” Ex. 1001, col. 19, ll. 30–33. Petitioner identifies responsive metering data sent by targeted meter 12 as corresponding to the recited “select information.” Pet. 54. This identification is not contested by Patent Owner.

Petitioner acknowledges that Mason “does not explicitly show that AMR server 20 ‘formats and stores select information for retrieval upon demand from a remotely located device,’” and relies on Cunningham for such a teaching. *Id.* In particular, Petitioner observes that, in Cunningham, the host module uses application software to compile information received from sensor interface modules (through data collection modules and data repeater modules) into a user-specified readable format, and makes such

information available to a customer at a separate computer. *Id.* at 17. This is sufficient identification of the limitation, and Petitioner’s rationale for combining Cunningham’s teaching with the other prior art is also sufficient, for the reasons expressed above.

2. *Dependent Claim 6*

Claim 6 depends from claim 5 and recites that “each wireless transmitter is configured to transmit a relatively low-power radio-frequency (RF) signal.” Ex. 1001, col. 19, ll. 34–36. The Specification of the ’661 patent explains:

The transceivers are preferably RF (Radio Frequency) transceivers, that are relatively small in size and transmit a relatively low power RF signal. As a result, in some applications, the transmission range of a given transceiver may be relatively limited.

Id. at col. 5, ll. 55–59. In addition, the Specification remarks that “in embodiments that do not utilize repeating transceivers, the transmitters will be configured to transmit at a higher RF power level, in order to effectively communicate with the control system local gateway.” *Id.* at col. 18, ll. 16–20. We agree with Petitioner that “the implication is that a transmitter that uses repeating transceivers transmits a relatively low-power RF signal.” Pet. 36. In addressing the challenge of claim 6 over Mason, Shuey, and Cunningham, the Petition asserts that “[b]ecause Mason discloses that its radio units use nearby repeaters in order to effectively communicate . . . , a

POSITA would understand [Mason's⁴] radio units transmit a relatively low-power RF signal." Pet. 65. We agree with this assertion, which is supported by testimony by Mr. Kinney. Ex. 1002 ¶ 129.

We have considered, but are not persuaded by, Patent Owner's counterarguments. PO Resp. 24–28. In particular, we disagree with Patent Owner that "Petitioner goes on to twist the words of the '661 patent to imply that the definition should somehow be based on whether repeaters are utilized." *Id.* at 26 (citing Pet. 36–37). We do not discern such an implication from Petitioner's argument. Rather, Petitioner is drawing the reasonable inference that the use of repeaters accommodates the use of a "relatively low-power RF signal," not that there is a definitional link between signal strength and the use of repeaters. Indeed, we thereby disagree that "illogical results occur when applying the definition to real life situations." *Id.* at 27. Patent Owner contends:

A transmitter with a range of 100 meters would be considered low power when used in a system where a relay was used to reach an intended receiver 200 meters away, but if in the same system a relay was not used because the intended receiver was only 50 meters away, the transmitter would be considered high power.

Id. The issue raised by the claim is not whether a particular transmitter would be "low power" in an absolute sense (as suggested by Patent Owner's

⁴ The Petition's erroneous reference to "Kahn's radio units" is an evident error. Except for the isolated misreference to "Kahn," the relevant section of the Petition makes no reference to "Kahn." Pet. 65–66. We thus find Patent Owner's argument based on the error without merit. PO Resp. 25 n.1.

omission of the word “relatively” in its hypothetical), but whether it would be of “*relatively* low-power” (emphasis added). Patent Owner’s hypothetical merely serves to emphasize the point that whether a particular network makes use of repeaters is reasonably impacted by the *relative* signal strength.

Petitioner’s alternative rationale that “Cunningham also teaches this feature” is also persuasive. Pet. 65. According to Cunningham, “various types of known, *low-power*, radio-frequency transmissions may be utilized.” Ex. 1006, col. 6, ll. 11–19 (emphasis added). Petitioner provides adequate rationale to combine that teaching with Mason’s system, given that both references are “directed to automatic meter reading systems and it is desirable in such systems, which could have many thousands of meters, to employ transceivers that are low cost and minimize the amount of interference with other transceivers.” Pet. 66 (citing Ex. 1002 ¶¶ 129–131). Patent Owner’s distinction that Cunningham “teaches a system where the transceivers do not repeat transmission, but instead communicate directly to a gateway on the first network” is not persuasive. PO Resp. 29. Petitioner is not proposing to “simply replace” transmitters from one reference with those in another reference as Patent Owner suggests. *Id.* at 30. Indeed, “[t]he test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference.” *In re Keller*, 642 F.2d 413, 425 (CCPA 1981).

3. *Dependent Claim 8*

Claim 8 depends from claim 5 and recites that “the gateway translates the encoded electrical signal, the transmitter identification, and the transceiver identification information into TCP/IP for communication over the WAN.” Ex. 1001, col. 19, ll. 39–42. The recitation of “the transceiver identification information” lacks explicit antecedent basis. Petitioner contends that “a POSITA would have understood the only possible antecedent basis for ‘the transceiver identification information’ in Claim 8 is the ‘identification information’ for *the ‘at least one wireless transmitter,’ because this is the only device for which Claims 5 or 8 recite ‘identification information.’*” Reply 20. We disagree with this contention.

Claim 1 of the ’661 patent refers to “transceiver identification information” as “associated with the transceiver making retransmission.” Ex. 1001, col. 18, ll. 47–49. To adopt Petitioner’s argument would result in a construction in which claim 8 duplicatively recites information that identifies the transmitter, thereby effectively—and improperly—reading the “transceiver identification information” out of the claim. *See In re Wilson*, 424 F.2d 1382, 1385 (CCPA 1970) (“All words in a claim must be considered in judging the obviousness of the claimed subject matter.”).

We thus agree with Patent Owner that the rationale articulated by Petitioner is conclusory, and insufficiently supported. PO Resp. 30–31. On the record before us, it is more reasonable to construe “the transceiver identification information” as referring to something other than the

identification information for the at least one wireless transmitter. For example, Patent Owner contends that “[o]ne skilled in the art, reading the plain text of claims 5 and 8, would easily recognize that the ‘transceiver’ referred to in claim 8 is the transmitter in claim 5 that is configured to both send and receive signals.” *Id.* at 33. Patent Owner provides support for this reading both by identifying disclosure in the Specification of the ’661 patent consistent with its position, and through testimony by its expert, Dr. Almeroth. *Id.* at 33–36 (citing Ex. 1001, Figs. 2, 3C, 3D, col. 6, ll. 3–8, col. 9, ll. 53–56, col. 10, ll. 32–34; Ex. 2009 ¶¶ 125–132). For example, Dr. Almeroth testifies that Mason’s AMR server “at most would need only some meter identification number and a meter reading.” Ex. 2009 ¶ 134. We credit this testimony, as well as Dr. Almeroth’s assertion that “[t]ransceiver identification information is extraneous for the needs of the AMR server in Cunningham and Mason.” *Id.*

Ultimately, we need not resolve the construction issues, and the issue of whether claim 8 is indefinite is not before us. 35 U.S.C. § 311(b) (limiting *inter partes* review to “a ground that could be raised under section 102 or 103”). It is sufficient for us to determine whether Petitioner has put forth sufficient evidence to meet its burden of establishing that claim 8 would have been obvious over the combination of Mason, Shuey, and Cunningham. In light of the foregoing considerations, we conclude that Petitioner has not.

F. Objective Indicia of Nonobviousness

Objective indicia of nonobviousness (also called secondary considerations) must always be considered when present and guard against reading the teaching of the invention into the prior art. *WBIP, LLC v. Kohler, Co.*, 829 F.3d 1317, 1328 (Fed. Cir. 2016) (citing *Transocean Offshore Deepwater Drilling Inc. v. Maersk Drilling USA, Inc.*, 699 F.3d 1340, 1349 (Fed. Cir. 2012)) (“[O]bjective considerations of non-obviousness must be considered in *every* case.”). There must be “a nexus between the evidence and the merits of the claimed invention.” *Id.* at 1331 (quoting *In re GPAC Inc.*, 57 F.3d 1573, 1580 (Fed. Cir. 1995)). In other words, “[e]vidence of secondary considerations must be reasonably commensurate with the scope of the claims.” *In re Huai-Hung Kao*, 639 F.3d 1057, 1068 (Fed. Cir. 2011) (citing *In re Hiniker*, 150 F.3d 1362, 1369 (Fed. Cir. 1998)).

Patent Owner contends that “[t]he non-obviousness of the claims is also supported by secondary considerations of non-obviousness, including satisfaction of a long-felt need, failure of others, and commercial success.” PO Resp. 36. But Patent Owner’s arguments regarding secondary considerations are cursory, lacking sufficient evidentiary support and based on insufficient proof of nexus to the claims. Accordingly, we accord them little weight. *In re Vamco Machine & Tool, Inc.*, 752 F.2d 1564, 1577 (Fed. Cir. 1985).

First, Patent Owner contends that “the inventive aspects of this invention met an unsolved need that had long been felt in industry,” and cites aspects of Kahn⁵ and Cunningham to suggest a need “to solve the problem of handling transmission failures and changes in network topology, using station-assigned paths.” PO Resp. 38. We agree with Petitioner that, in making this argument, Patent Owner “relies on bare attorney characterization of Kahn and Cunningham—without expert support.” Reply 26. We also agree with Petitioner that Patent Owner “has not established a nexus to any purportedly unsolved need.” *Id.* at 27 (citing PO Resp. 38).

Second, Patent Owner contends that “the rapid growth of the industrial sensors and wireless networks illustrates the commercial success of this invention.” PO Resp. 39. To support this statement, Patent Owner cites marketing statements from Petitioner’s web site, but provides no objective evidence upon which to evaluate commercial success, such as market share, changes in market share, profitability, and the like. *Id.* In addition, Patent Owner alludes to the nexus requirement by asserting that each of the challenged claims “has been shown in Patent Owner’s infringement contentions in the U.S. District Court litigation to be infringed by such Emerson products.” *Id.* at 40. But mere allegations of infringement

⁵ Robert E. Kahn, Steven A. Gronemeyer, Jerry Burchfiel, and Ronald C. Kunzelman, *Advances in Packet Radio Technology*, 66 PROC. IEEE 1468 (1978) (Ex. 1003). Kahn is cited in the Petition in connection with grounds upon which we did not institute review.

of the claims are insufficient to establish the required nexus between sales and the merits of the claimed invention. *Seagate Tech. (US) Holdings, Inc. v. Enova Tech. Corp.*, Case IPR2014-01297, slip op. at 31 (PTAB Feb. 4, 2016) (Paper 51) (“Patent Owner’s assertions are unpersuasive to the extent that they are based on unsubstantiated allegations made in its own Complaint, from the related district court proceeding between the parties, which Petitioner denied in a responsive Answer.”).

Third, Patent Owner asserts that it has “licensed this patent to dozens of companies in a variety of fields,” and cites a website that provides a list of “Current Licensees.” PO Resp. 40; Ex. 2003. But Patent Owner provides no information regarding the scope of the licenses themselves, nor does Patent Owner provide evidence of reasons to support that the licenses were taken out of respect for the strength of the patent instead of other economic reasons. *See In re Antor Media Corp.*, 689 F.3d 1282, 1293–94 (Fed. Cir. 2012) (allegation of licenses insufficient where “[t]he licenses themselves are not even part of the record); *Seagate* at 34 (rejecting licensing argument because the Board “cannot verify Patent Owner’s assertions regarding these agreements”); *Pentec, Inc. v. Graphic Controls Corp.*, 776 F.2d 309, 316 (Fed. Cir. 1985) (“argument suffers from a lack of record evidence that those who refrained from infringement and who sought licenses did so out of respect for the strength of the patent and not out of a desire to avoid the costs of litigation”).

For these reasons, i.e., because Patent Owner's arguments suffer from insufficient evidentiary support and insufficient proof of the required nexus, we find that the record of objective indicia of nonobviousness weighs no more than minimally in favor of a conclusion of nonobviousness.

G. Summary

Having considered the *Graham* factors, we conclude that Petitioner demonstrates, by a preponderance of the evidence, that claims 5 and 6 are unpatentable under 35 U.S.C. § 103(a) over Mason, Shuey, and Cunningham. Petitioner does not demonstrate, by a preponderance of the evidence, that claim 8 is unpatentable on the instituted ground.

III. ORDER

It is

ORDERED that, based on a preponderance of the evidence, claims 5 and 6 of U.S. Patent No. 7,468,661 B2 are held to be unpatentable; and

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

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