

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

EMERSON ELECTRIC CO.,
Petitioner,

v.

SIPCO, LLC,
Patent Owner.

IPR2019-00547
Patent 8,964,708 B2

Before JONI Y. CHANG, BRYAN F. MOORE, and CHRISTA P. ZADO,
Administrative Patent Judges.

MOORE, *Administrative Patent Judge.*

FINAL WRITTEN DECISION
35 U.S.C § 318(a)

I. INTRODUCTION

Emerson Electric Co. (“Petitioner”) filed a Petition (“Pet.,” Paper 1) pursuant to 35 U.S.C. § 311 to institute an *inter partes* review of claims 1–24 of U.S. Patent No. 8,964,708 B2 (“the ’708 patent,” Ex. 1101). The Petition is supported by the Declaration of Vijay K. Madiseti Ph.D. (Ex. 1103). SIPCO, LLC (“Patent Owner”) filed a preliminary response. Paper 9 (“Prelim. Resp.”). In an August 30, 2019 Institution Decision, we determined that Petitioner had a reasonable likelihood of prevailing as to at least one of the challenged claims of the ’708 patent. Paper 15 (“Inst. Dec.”). Accordingly, we instituted an *inter partes* review pursuant to 37 C.F.R. § 42.108. Inst. Dec. 46.

Patent Owner filed a Patent Owner Response (Paper 19, “PO Resp.”) to which Petitioner filed a Reply (Paper 22, “Reply”). Patent Owner also filed a Sur-Reply. Paper 24. Patent Owner relies on the testimony of Dr. Ghobad Heidari. Ex. 2004.

Both parties requested a hearing for oral argument (Papers 26 and 28), and a hearing was held May 29, 2020. *See* Paper 34 (“Tr.”).

A. Related Matters

Petitioner advises us that several district court lawsuits may affect or be affected by this proceeding. Pet. 3–4.¹ The ’708 patent is the subject of co-pending IPR2019-00545.

¹ The Petition’s Table of Contents is labeled with pages 1–6 and then the Petition starts again at page 1 for the body of the Petition. Citations herein are to the body of the Petition.

B. The '708 Patent

The '708 patent is directed to a system and method for remotely operated systems and, more particularly to a system for monitoring, controlling, and reporting on remote systems utilizing radio frequency (RF) transmissions. Ex. 1001, Abstract.

C. Illustrative Claim

Challenged claims 1, 11, 16, and 22 are independent claims. Challenged claims 2–10, 12–15, 17–21, 23, and 24 depend from claims 1, 11, 16, or 22. Claim 1, reproduced below, is illustrative.

1. A wireless communication device for use in a wireless communication system configured to communicate command and sensed data within the wireless communication systems, the wireless communication device comprising:
 - a transceiver configured to send and receive wireless communications;
 - and a controller configured to communicate with at least one other remote wireless device via the transceiver with a preformatted message, the controller further configured to format a message comprising a receiver address comprising an address of at least one remote wireless device; a command indicator comprising a command code; a data value comprising a message, wherein the controller is configured to receive a preformatted message from another wireless communication device, and based on a command code provided in the preformatted message, implement a certain function corresponding to the command code.

Ex. 1101, 14:6–23.

D. Prior Art Relied Upon

Petitioner relies upon the following prior art references:

Johnson	US 5,673,252	Sept. 30, 1997 ²	(Ex. 1106)
Cunningham	US 6,124,806	Sept. 26, 2000 ³	(Ex. 1107)
Ardalan	US 6,396,839 B1	May. 28, 2002 ⁴	(Ex. 1108)
Lee	US 5,477,216	Dec. 19, 1995 ⁵	(Ex. 1109)
Lyons	US 6,208,266 B1	Mar. 27, 2001 ⁶	(Ex. 1110)
Ehlers	US 5,696,695	Dec. 9, 1997 ⁷	(Ex. 1111)

² Filed May 26, 1995.

³ Filed Sept. 11, 1998.

⁴ Filed February 12, 1998.

⁵ Filed October 30, 1992.

⁶ Filed April 28, 1997.

⁷ Filed June 7, 1995.

E. Instituted Grounds of Unpatentability

Petitioner contends that claims 1–24 are unpatentable based on the following grounds (Pet. 5–6):

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1–2, 5–8, 10–13, 15–20, 22, 24	103	Johnson
3–4, 9, 14, 16–24	103	Johnson and Cunningham
10, 24	103	Johnson and Lyons
3–4, 14, 21	103	Johnson and Ardalan
11–13, 15	103	Johnson and Ehlers
5, 19	103	Johnson and Lee
14, 19, 24	103	Johnson in view of Cunningham or Ardalan and in further view of Lyons, Ehlers, or Lee

II. DISCUSSION

A. Relevant Law

1. Evidentiary Burden

Petitioner bears the burden of proving unpatentability of the challenged claims, and the burden of persuasion never shifts to Patent Owner. *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015). To prevail in its challenges, Petitioner must demonstrate by a preponderance of the evidence that the challenged claims are unpatentable. 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d).

2. Obviousness

A claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and, (4) where in evidence, objective indicia of non-obviousness (i.e., so-called secondary considerations), including commercial success, long-felt but unsolved needs, failure of others, and unexpected results.⁸ *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

3. Level of Skill

The level of ordinary skill in the art usually is evidenced by the references themselves. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001); *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995); *In re Oelrich*, 579 F.2d 86, 91 (CCPA 1978). For an obviousness analysis, prior art references must be “considered together with the knowledge of one of ordinary skill in the pertinent art.” *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994) (quoting *In re Samour*, 571 F.2d 559, 562 (CCPA 1978)). Moreover, “it is proper to take into account not only specific teachings of the reference but also the inferences which one skilled in the art would

⁸ Patent Owner does not put forth evidence it alleges tends to show secondary considerations of non-obviousness in its Patent Owner Response.

reasonably be expected to draw therefrom.” *In re Preda*, 401 F.2d 825, 826 (CCPA 1968). That is because an obviousness analysis “need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.” *KSR*, 550 U.S. at 418.

Petitioner contends a person of ordinary skill in the art of the subject matter of the ’708 patent would have had

a minimum of a bachelor’s degree in electrical engineering, computer engineering, computer science, or a related field, and two or more years of experience in the development or design of wireless communication systems, or the equivalent. Additional graduate education could substitute for professional experience, or significant experience in the field could substitute for formal education. A person having this background would have understood how to design and build wireless, multi-hop communications systems for monitoring and controlling remote devices.

Pet. 8–9 (citing Ex. 1103 ¶¶ 26–30). Patent Owner does not offer a proposed level of skill in its Patent Owner Response and does not address Petitioner’s assertions regarding the education or experience of an ordinarily skilled artisan at the time of the invention. *See generally* PO Resp. We adopt Petitioner’s articulation of the level of skill and acknowledge that the level of ordinary skill in the art is also reflected by the prior art of record. *See Okajima*, 261 F.3d at 1355; *GPAC Inc.*, 57 F.3d at 1579 (Fed. Cir. 1995); *Oelrich*, 579 F.2d at 91.

B. Claim Construction

In an *inter partes* review, we interpret claims in the same manner used in a civil action under 35 U.S.C. § 282(b). *See* Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before

the Patent Trial and Appeal Board, 83 Fed. Reg. 51,340, 51,340, 51,358 (Oct. 11, 2018) (amending 37 C.F.R. § 42.100(b) effective November 13, 2018) (now codified at 37 C.F.R. § 42.100(b) (2019)).

Patent Owner argues that the preamble of the independent claims are limiting. PO Resp. 12. Specifically, Patent Owner argues the phrase “configured to communicate command and sensed data within the wireless communication system,” recited in the preamble of claim 1, limits the body of the claim to a system in which

[e]ach transceiver can . . . (1) send command data to another transceiver; (2) receive command data from a transceiver; (3) send sensed data to another transceiver; and (4) receive sensed data from a transceiver . . . [i.e.,] multiple paths at its disposal for sending and receiving messages between each integrated transceiver and each local gateway.

Id. at 17. In other words, Patent Owner argues the preamble limits the claim to bidirectional multipath communication of both command and sensed data between each integrated transceiver and each local gateway.⁹ We determine that the preambles are not limiting and, if they were limiting, we would determine that they do not limit the claim in the way Patent Owner suggests.

In support of its argument, Patent Owner argues the preamble “provides antecedent basis for the ‘another wireless communication device’ recited later in the body of the claim” and argues “being ‘configured to communicate command and sensed data’ is not merely an intended use, but instead is an important characteristic of the claimed invention that

⁹ Although Patent Owner does not specifically use the term “bidirectional multipath communication,” we use it here to succinctly describe their position on claim construction.

distinguishes it from the asserted references. *Id.* at 12–13 (internal citation omitted).

Petitioner, on the other hand, contends that the preambles are not limiting because the full preamble phrase, “for use in a wireless communication system configured to communicate command and sensed data within the wireless communication systems,” is an intended use, because the claim body recites a “structurally complete invention” and because Patent Owner conceded in a related ITC proceeding that the preamble is not limiting. Reply 1–3. We are persuaded by Petitioner’s contention in this regard.

In general, a preamble limits the invention if it recites essential structure or steps or if it is “‘necessary to give life, meaning, and vitality’ to the claim.” *Catalina Mktg. Int’l, Inc. v. Coolsavings.com, Inc.*, 289 F.3d 801, 808 (Fed. Cir. 2002) (quoting *Pitney Bowes Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305 (Fed. Cir. 1999)). A preamble, however, is not limiting where the claim body defines a structurally complete invention and the preamble only states a purpose or intended use for the invention. *Id.*

The body of independent claim 1 recites a wireless communication device that comprises a “controller” configured to “format a message comprising . . . a command code . . . [and] a data value,” and to “receive” a message including a “command code” from “another wireless communication device.” Reply 3. Thus, command and other data values are specifically and structurally recited in the body of the claim. The body of claim 1 recites a structurally complete invention. Accordingly, we determine that the preamble of claim 1 does not recite any essential structure not already recited in the bodies of these claims.

Additionally, the phrase “[a] wireless communication device for use in a wireless communication system configured to communicate command and sensed data within the wireless communication systems,” indicates that the wireless communication *system is configured to communicate*, not that the wireless communication *device* is so configured, because a modifier (in this case “configured”) in a sentence generally modifies the word that comes closest to it.

Patent Owner suggests the phrase “configured to communicate command and sensed data within the wireless communication systems” is a “different portion” of the preamble. PO Resp. 12 n. 2; *see Bell Commc’ns Research, Inc. v. Vitalink Commc’ns Corp.*, 55 F.3d 615, 621 (Fed. Cir. 1995) (holding a portion of the preamble can be limiting on the claimed invention). We determine that, although a portion of a preamble can be limiting, here, the portion to which Patent Owner points is not separate but is a part of the “use” indicated for the system. *See Bell Commc’ns Research, Inc. v. Vitalink Commc’ns Corp.*, 55 F.3d 615, 621 (Fed. Cir. 1995) (holding a portion of the preamble can be limiting on the claimed invention).

As to antecedent basis, again the preamble phrase does not refer to the configuration of the wireless device but rather the configuration of a “wireless communication system” within wireless communication systems. Thus, the only structural language in the preamble that could provide antecedent basis for “another wireless communication device” is simply the recitation of “wireless communication device.” The fact that “wireless communication device” may provide antecedent basis for “another wireless communication device” does not mean that the rest of the preamble, which

describes an intended use, is limiting. *See Cochlear Bone Anchored Sols. AB v. Oticon Med. AB*, 958 F.3d 1348, 1355 (Fed. Cir. 2020).

Additionally, if a preamble appears to contain an “antecedent basis” for a term mentioned in the body of a claim, that is no guarantee that the preamble is limiting. The preamble language must still supply some additional, vital information that is missing from the body of the claim for that particular guideline to apply. *See, e.g., TomTom, Inc. v. Adolph*, 790 F.3d 1315, 1322–24 (Fed. Cir. 2015) (ruling that certain preamble terms were not limiting because these terms were merely duplicative of the terms in the body of the claim, even though the preamble did provide an antecedent basis for another term in the body of the claim) (citations omitted); *see also Am. Med. Sys., Inc. v. Biolitec, Inc.*, 618 F.3d 1354, 1359 (Fed. Cir. 2010) (“We have held that the preamble has no separate limiting effect if, for example, ‘the preamble merely gives a descriptive name to the set of limitations in the body of the claim that completely set forth the invention.’” (quoting *IMS Tech., Inc. v. Haas Automation, Inc.*, 206 F.3d 1422, 1434–35 (Fed. Cir. 2000))).

Additionally, the use of the indefinite adjective “another” does not suggest that it is the same wireless communication device in the preamble or that it has the same properties as the device in the preamble (or the device in the body of the claim). The word “another” may simply suggest that it is a different wireless communication device than the one described earlier. The Patent Owner could have said “another one of said (or the)” wireless communication device using a definite article rather than “another” which is analogous to the indefinite article “a.” *Predicate Logic, Inc. v. Distributive Software, Inc.*, 544 F.3d 1298, 1305 (Fed. Cir. 2008) (finding another does

not require antecedent basis—“the ‘comparing’ step does not compare data sets linked to ‘*an* instantiated index’ with data sets linked to ‘*another* instantiated index’; it compares data sets linked to ‘one of *said* instantiated indexes’ with data sets linked to ‘another of *said* instantiated indexes.’ The ‘*said* instantiated indexes’ must be instantiated indexes with an antecedent basis elsewhere in the claim.”)

Patent Owner also argues that “communicating command and sense data,” as interpreted by Patent Owner is an “important” aspect of the invention which reinforces it being considered a limitation of the claim. PO Resp. 13 (citing *Poly-America, L.P. v. GSE Lining Tech., Inc.*, 383 F.3d 1303, 1310 (Fed. Cir. 2004) (“*Poly-America I*) and *Proveris Sci. Corp. v. Innovasystems, Inc.*, 739 F.3d 1367, 1373 (Fed. Cir. 2014)).

As an initial matter, we note that *Poly-America I* relied on the fact that, in that case, “[t]he specification [was] replete with references to the invention as a ‘blown-film’ liner, including the title of the patent itself and the ‘Summary of the Invention’ . . . [and it was] used repeatedly to describe the preferred embodiments.” *Poly America, L.P.*, 383 F.3d at 1310. Additionally, *Proveris* relies on repeated recitation of the phrase or versions of the phrase “sequential set of images of a spray plume” from the preamble in the specification. *Proveris Sci. Corp.*, 739 F.3d at 1373. Here, Patent Owner does not point to repeated recitation of “communication of command and sensed data,” rather as explained below, Patent Owner relies on one figure in the patent and one statement in the specification to derive the meaning it assigns to the preamble. Thus, we do not determine that this is an “important” aspect of the invention that reinforces it being considered a limitation of the claim as in the *Poly-America I* and *Proveris* cases.

As such, Patent Owner argues based on Figure 2 of the '708 Patent and testimony of its declarant that “communicate” in the preamble means bidirectional multipath communication of both command and sensed data. *See* PO Resp. 13–19 (citing Ex. 1001, Fig. 2; Ex. 2004 ¶¶ 28–31). Patent Owner’s two annotated versions of Figure 2 outlining its position are reproduced below. PO Resp. 15–16.

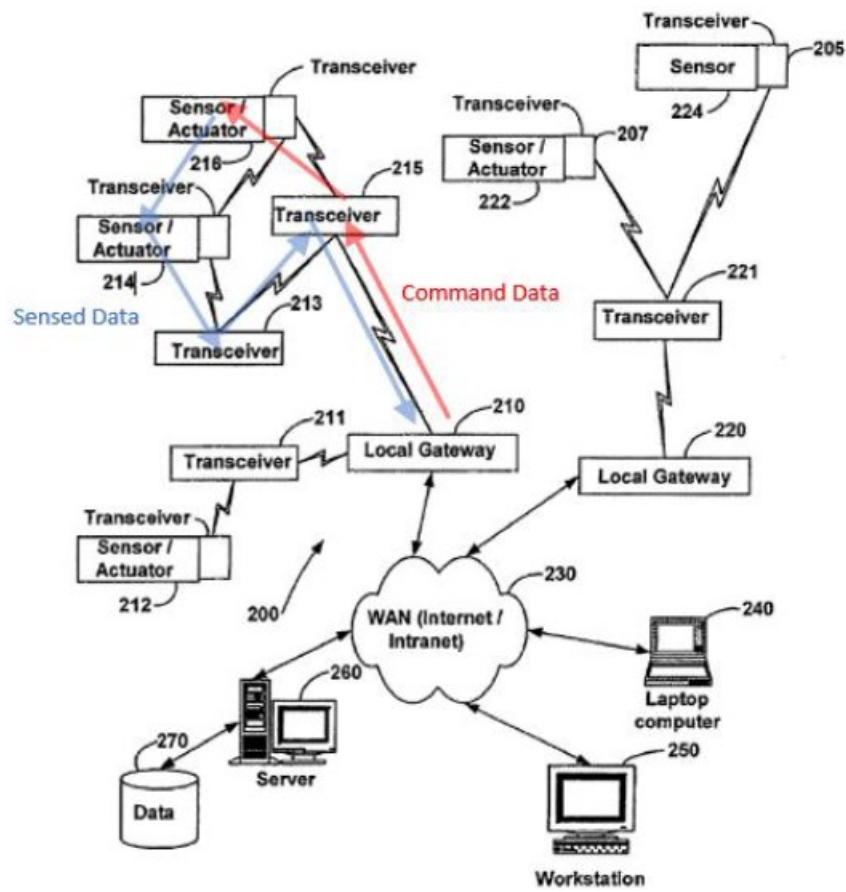


FIG. 2

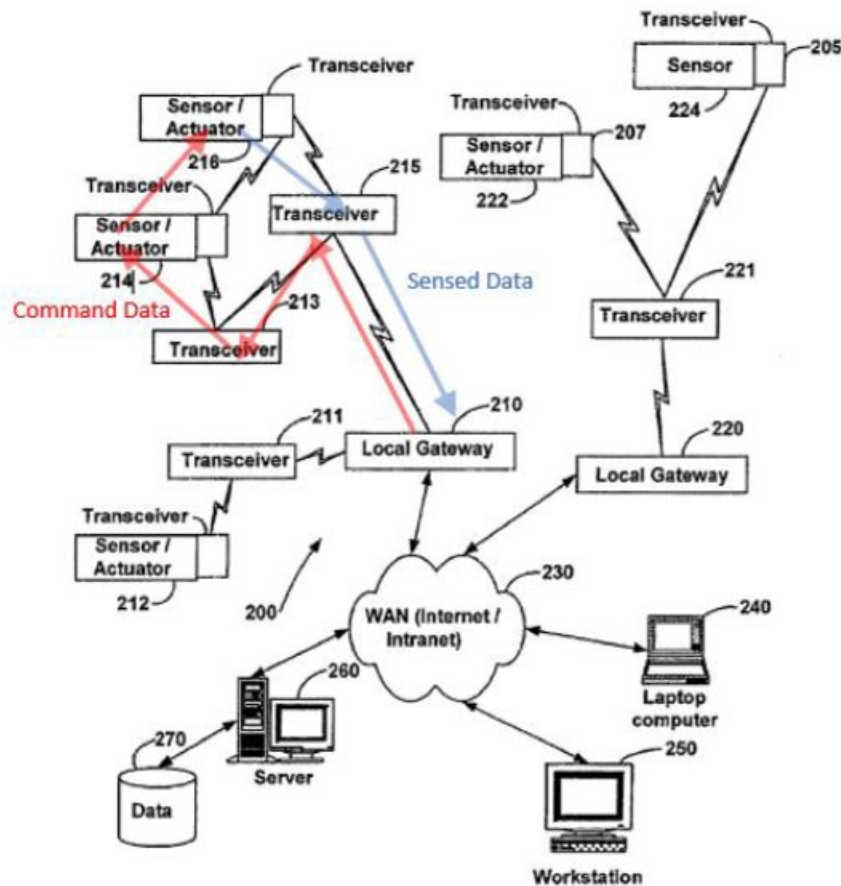


FIG. 2

Patent Owner's two annotated version of Figure 2 are reproduced above. First annotated Figure 2, above, shows Sensor/Actuators 214 and 216 connected to each other and individually connected to Transceivers 213 and 215 by a symbol representing wireless data transfer, the Transceivers 213 and 215 are connected to each other by that symbol, and with the Transceiver 215 connected by a Local Gateway 210 by that symbol. Additionally, a red arrow representing command data goes from Local Gateway 210 though Transceiver 215 to Sensor/Actuator 216 and a blue arrow representing sensed data goes from Sensor/Actuator 216 to Sensor/Actuator 214 to Transceiver 213 Transceiver 215 and then to Local

Gateway 210. The second annotated version of Figure 1 above is the same as the first except the red arrows and blue arrows are interchanged and reversed in direction. Patent Owner argues this figure shows bidirectional and multipath communication from Sensor 216 to Local Gateway 210. *Id.* at 22–23.

Patent Owner argues that “[t]he importance of the ability to communicate both command and sensed data [in the way Patent Owner describes] is evident throughout the ’708 patent, including Figure 2.” PO Resp. 13. Patent Owner contrasts Figure 2 with Figure 1 (prior art), which shows sensors/actuators with a single path to the controller and could only receive command data and send sensed data. Patent Owner’s annotated Figure 1 outlining its position is reproduced below. PO Resp. 18.

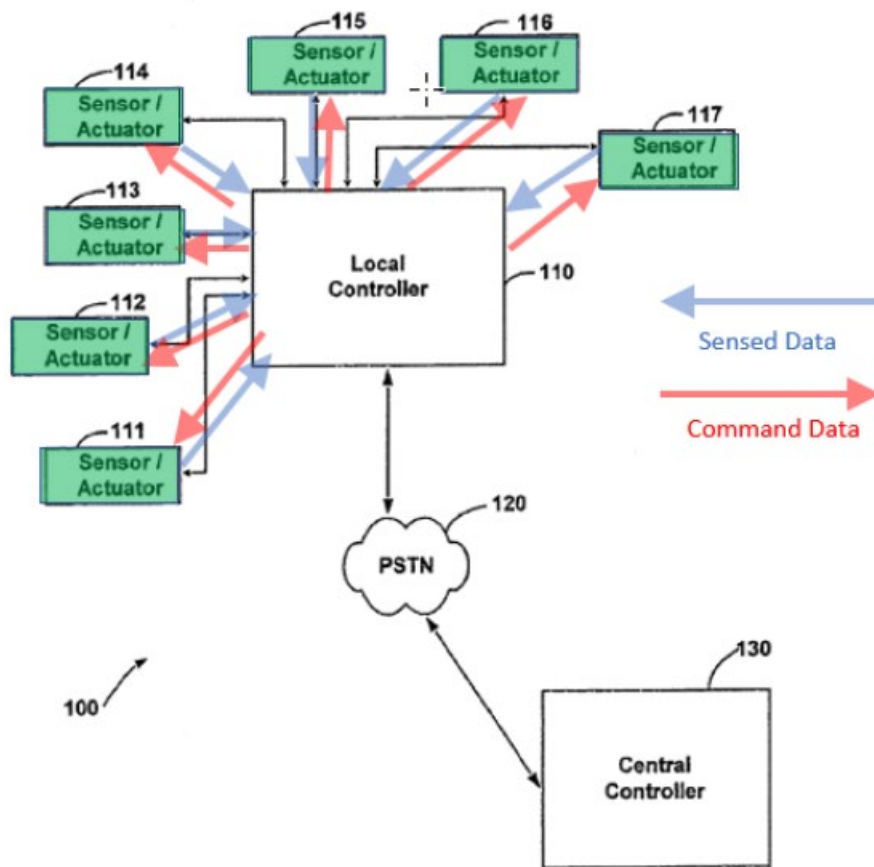


FIG. 1
(PRIOR ART)

Patent Owner's annotated version of Figure 1 is reproduced above. Annotated Figure 1, above, shows Sensor/Actuators 111–117 in green connected to Local Controller 110 with red arrows representing command data pointing from the local Controller 110 to the Sensor/Actuators 111–117 and a blue arrow representing sensed data pointing from the Sensor/Actuators 111–117 to the Local Controller. The specification states “prior art control systems [such as shown in Figure 1] often are susceptible to a single point of failure if the local controller 110 goes out of service.” Ex. 1001, 2:30–32. Patent Owner argues this figure shows unidirectional

and single path communication from Sensor/Actuators 111–117 to Local Controller 110.

In sum, Patent Owner contends that the language “configured to communicate command and sensed data within the wireless communication system” imports a limitation of bidirectional multipath communication of command and sensed data to avoid a single point of failure problem in the prior art. We determine even if the preamble were limiting in some way, there is no support for importing “bidirectional multipath communication” into the claims.

Although the specification may have *an* embodiment or *all* embodiments allowing bidirectional communication of both command and sensed data, Patent Owner did not use the word “bidirectional multipath communication” in its claims and instead chose the broader term “communication.” *See In re Am. Acad. of Sci. Tech Ctr.*, 367 F.3d 1359, 1369 (Fed. Cir. 2004) (“We have cautioned against reading limitations into a claim from the preferred embodiment described in the specification, even if it is the only embodiment described, absent clear disclaimer in the specification.”). The fact that a limitation in the specification may define over the prior art does not justify importing that limitation into the claims unless a term is expressly defined such that the Patentee becomes his own lexicographer or there is an express disavowal of that claim scope. *See GE Lighting Sols., LLC v. AgiLight, Inc.*, 750 F.3d 1304, 1308-9 (Fed. Cir. 2014).

There is no evidence of an express definition here. As to disavowal, the Federal Circuit has explained that the standard for disavowal is particularly exacting:

Mere criticism of a particular embodiment encompassed in the plain meaning of a claim term is not sufficient to rise to the level of clear disavowal. *Epistar Corp. v. Int'l Trade Comm'n*, 566 F.3d 1321, 1335 (Fed.Cir.2009) (holding that even a direct criticism of a particular technique did not rise to the level of clear disavowal). In *Spine Solutions, Inc. v. Medtronic Sofamor Danek USA, Inc.*, we explained that even where a particular structure makes it “particularly difficult” to obtain certain benefits of the claimed invention, this does not rise to the level of disavowal of the structure. 620 F.3d 1305, 1315 (Fed.Cir.2010). It is likewise not enough that the only embodiments, or all of the embodiments, contain a particular limitation. We do not read limitations from the specification into claims; we do not redefine words. Only the patentee can do that. To constitute disclaimer, there must be a clear and unmistakable disclaimer.

Thorner v. Sony Computer Entm't Am. LLC, 669 F.3d 1362, 1366–67 (Fed. Cir. 2012).

The statement in the specification that “prior art control systems often are susceptible to a single point of failure” is not a sufficiently express disavowal of unidirectional single-path communication. Although, “[a]n inventor may also disavow claim scope ‘by distinguishing the claimed invention over the prior art.’” *Techtronic Indus. Co. v. Int'l Trade Comm'n*, 944 F.3d 901, 907 (Fed. Cir. 2019) (quoting *Ekchian v. Home Depot, Inc.*, 104 F.3d 1299, 1304 (Fed. Cir. 1997)). The disavowal generally must be express. *Ekchian*, 104 F.3d at 1304 (finding no disavowal because “[the patent owner] did refer generally to the benefits of using a solid insulator instead of a liquid insulator as a dielectric. However, [the patent owner] did not characterize the specific liquid used in the prior art device . . .). Here, Petitioner does not sufficiently show an express disavowal, rather simply a criticism of the prior art.

Nevertheless, disavowal can be found implicitly. “[W]hen the scope of the invention is clearly stated in the specification, and is described as the advantage and distinction of the invention, it is not necessary to disavow explicitly a different scope.” *On Demand Mach. Corp. v. Ingram Indus., Inc.*, 442 F.3d 1331, 1340 (Fed. Cir. 2006). “[A]n inventor may [also] disavow claims lacking a particular feature when the specification describes ‘the present invention’ as having that feature.” *Poly-America, L.P. v. API Industries, Inc.*, 839 F.3d 1131, 1136 (Fed. Cir. 2016).

Here the statement relied on by the Patent Owner does not assert that the “present invention” is characterized by “bidirectional multipath communication,” nor does it clearly describe the feature of the invention that the prior art is lacking. Although Patent Owner argues “[t]he importance of the ability to communicate both command and sensed data is evident throughout the ’708 patent,” Patent Owner cites only to Figure 2 and its declarant for the proposition that “bidirectional multipath communication” is the feature to which the claims are being limited. PO Resp. 13–18; Sur-Reply 4. Patent Owner has not shown that the criticism of “single point of failure” is tied to a clearly expressed inventive feature of “bidirectional multipath communication.”

Petitioner, for its part, shows that Figure 2 of the specification of the ’708 patent may be read to show devices that have a single point of failure.

Reply 4. Patent Owner response

that

[t]here is always the possibility that wireless devices will not be within communication range of one another or that there will not be enough devices to form redundant paths in all instances . . . [b]ut these facts do not alter that the claimed

technology enables networks to minimize or avoid the prior art single-point-of-failure problems.

Sur-Reply 4. Nevertheless, Patent Owner's assertion that single point of failure problems should be "minimized" does not suggest the clear disavowal required by the law. Thus, we do not limit the plain meaning of "communication" to bidirectional multipath communication of command and sense data.

Accordingly, Patent Owner has not shown that "configured to communicate command and sensed data" means bidirectional multipath communication of command and sense data, nor has Patent Owner shown that bidirectional multipath communication is an important aspect of the invention such that it limits the claim.

Patent Owner also argues that the preambles of claims 11, 16, and 22 are limiting. PO Resp. 51, 58–59, 63–64. Claim 11 recites "a method of communicating command and sensed data between remote wireless devices" with steps that do not require bidirectional communications over multiple paths. Patent Owner refers to its claim 1 argument that bidirectional multipath communication was an "important" distinction over the prior art. PO Resp. 51. Patent Owner also admits that the body of the claim provided structure for command data. *Id.* As discussed above, this tends to show that the body recites a structurally complete invention. Thus, we are not convinced by Patent Owner's argument and do not determine that the preamble of claim 11 is limiting.

Claim 16's preamble recites "[i]n a communication system to communicate command and sensed data between remote devices." Patent Owner refers to its claim 1 argument that bidirectional multipath

communication was an “important” distinction over the prior art. PO Resp. 58–59. Patent Owner also suggests that the preamble provides antecedent basis for the terms “first wireless remote device” and “second wireless remote device” in the body of the claim; nevertheless, the body of the claim uses the indefinite article “a” to introduce “*a* first wireless remote device,” “*a* second wireless remote device,” and “at least one *other* remote device” in the body of the claim which suggests those terms do not need antecedent basis. *Id.* Thus, we are not convinced by Patent Owner’s argument and do not determine that the preamble of claim 16 is limiting.

Claim 22 recites a “wireless communication device for use in a system to communicate to communicate commands and sensed data between remote wireless communication devices.” Patent Owner refers to its claim 1 argument that bidirectional multipath communication was an “important” distinction over the prior art. PO Resp. 63–64. Patent Owner also suggests that the preamble phrase “remote wireless communication devices” provides antecedent basis for the terms “remote wireless device[s]” in the body of the claim; nevertheless, the body of the claim uses the indefinite adjectives “one” and “other” to introduce “at least one remote wireless device” and “at least one *other* remote wireless device” in the body of the claim which suggest those terms do not need antecedent basis. *Id.* Thus, we are not convinced by Patent Owner’s argument and do not determine that the preamble of claim 22 is limiting.

We determine that it is not necessary to provide an express interpretation of any other term of the claims. *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (only terms that are in controversy need to be construed, and only to the extent necessary to resolve

the controversy); *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (applying *Vivid Techs.* in the context of an inter partes review).

A. Obviousness of Claims over Johnson

Petitioner contends that claims 1, 2, 5–8, 10–13, 15–20, 22, and 24 are unpatentable under 35 U.S.C. § 103(a) as obvious over Johnson. Pet. 6. To support its contentions, Petitioner provides explanations as to how the prior art allegedly teaches each claim limitation. *Id.* at 21–34, 36–44, 47–78, 85–90, 92–94. For convenience, all references cited in the grounds of the Petition are summarized below.

1. Johnson (Ex. 1106)

Johnson discloses a system in which a wide area communications network collects network service module (NSM) data generated by a plurality of physical devices within a geographical area. Ex. 1106, 9:47–51. The wide area communications network includes a plurality of network service modules 110, a plurality of remote cell nodes 112, a plurality of intermediate data terminals 114, and a central data terminal 120. *Id.* at 9:51–56, Fig. 1. The physical devices may be, for example, a utility meter for electricity, gas, or water. *Id.* at 9:57–58.

2. Cunningham (Ex. 1107)

Cunningham was filed September 11, 1998, and issued September 26, 2000. Ex. 1107, at [22], [45]. On the record presented, it is prior art to the challenged claims under 35 U.S.C. § 102(e).

Cunningham discloses a “wide-area remote telemetry system which monitors and controls remote devices by means of an information control

system.” *Id.* at [57] (Abstract). Figure 1 of Cunningham is reproduced below.

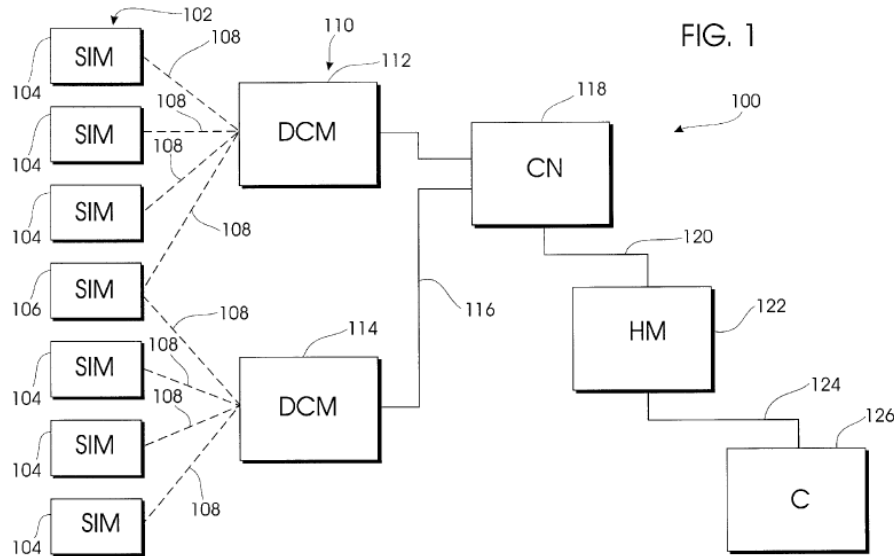


Figure 1 shows a block diagram of a wide-area remote telemetry system. *Id.* at 6:6–8. Multiple sensor interface modules 102 act as data gathering equipment. *Id.* at 6:9–11. The sensor interface modules attach to gas, electric and water meters, and other types of monitored equipment and include an appropriate hardware sensor for the device being monitored and a transmitter for communicating sensor data to data collection modules using low-power radio-frequency transmissions. *Id.* at 7:30–44. Cunningham discloses that the sensor interface modules can be configured to communicate with data collection modules 112 and 114 via hardwire or wireless transmission (*id.* at 6:12–14), but it is the wireless embodiment teaching that Petitioner asserts against the challenged claims. *See, e.g.*, Pet. 81 (asserting the wireless embodiment teaching of Cunningham against independent claim 32).

The data collection modules transmit the information received from the sensor interface modules to network system 118, which “forwards the

transmitted information over a network connection 120 to a host module 122 where the information is stored or processed.” *Id.* at 7:19–24. “The stored or processed information may then be transmitted from the host module 122 through a host connection 124 to the customer interface 126.” *Id.* at 7:24–27.

“If the data collection module is used in remote areas, access to network connections to the host may be few and far between.” *Id.* at 33:16–18. “Thus, it may be necessary for the data collection module to receive information from both sensor interface modules and from other data collection modules and transmit this information towards a data collection module which is connected to the host module through a network system.” *Id.* at 33:18–23. “When the data collection module is used in this manner it is also called a data repeater module.” *Id.* at 33:24–25.

3. Ehlers (Ex. 1111)

Ehlers teaches how to structure software on a first microcomputer operating as a gateway between two networks—e.g., an external network and a LAN. Ex. 1111, 8:10–17.

4. Lyons (Ex. 1110)

Lyons teaches a network of wireless data acquisition devices that periodically “ping” other devices to verify that they are “functioning properly.” Ex. 1110, 36:65–37:21, 37:44–48.

5. Lee (Ex. 1109)

Lee discloses that CEBUS packets can include multiple commands in a packet along with separators. Ex. 1009, Fig. 4:34–49, Fig. 7A.

6. Ardalan (Ex. 1108)

Ardalan discloses assigning individual and broadcast TCP/IP addresses to each meter on a CEBUS LAN connected, through a gateway, to a TCP/IP wide area network (“WAN”). Ex. 1108, 1:29–38, 2:34–67. Each meter processes TCP/IP information using TCP/IP interface software. *Id.* at, 3:14–18, 3:28–31

7. Analysis

a. Claim 1

i. “A wireless communication device . . .”

Petitioner contends that Johnson teaches a “wireless communication device for use in a wireless communication system configured to communicate command and sensed data within the wireless communication systems, the wireless communication device,” as recited in claim 1. Pet. 21–23; Ex. 1106, 5:15–17, 9:47–58, 10:10–23, 10:36–56, 10:62–11:10, 11:17–20, 14:46–56; 18:3–46, 20:40–65, 31:20–43, 39:20–46, 55:30–59, Fig. 1; Ex. 1103 ¶¶ 386–89.^{10, 11} As explained above, we determined that the preamble is not limiting but we rely on Petitioner’s contentions cited above as a predicate of the contentions below, so they are listed here. Patent

¹⁰ A similar limitation was found to be met by the same references in the Final Written Decision in IPR2016-01895. IPR2016-01895, Paper 31 at 40 (PTAB Mar. 21, 2018). We have considered the similarity of other limitations in this case to limitations in IPR2016-01895, we make an independent Judgment on the merits here. Additionally, for brevity, we will not refer to any other limitation’s similarity to limitations in IPR2016-01895 outside of this footnote.

¹¹ We have reviewed Petitioner’s arguments and the underlying evidence cited in support and are persuaded Petitioner sufficiently establishes unpatentability by a preponderance of the evidence, as cited here and throughout this Decision, unless we specifically state that we do not rely on, or are not persuaded by a particular contention.

Owner's arguments regarding the preamble are not commensurate with the scope of the invention as properly construed. *See* PO Resp. 19–23.

ii. “a transceiver configured to send and receive wireless communications”

Petitioner establishes by a preponderance of the evidence that Johnson teaches “a transceiver configured to send and receive wireless communications,” as recited in claim 1. Pet. 23–24; Ex. 1106, 18:3–46, 31:39–41; Fig. 1, 9; Ex. 1103 ¶ 390–92.

Patent Owner contends that “Johnson therefore does not render obvious claim 1 because the RCNs—the alleged ‘wireless communication devices’—cannot send data in a manner that qualifies them as either ‘[a] wireless communication device’ or ‘another wireless communication device.’” PO Resp. 20 (citing Ex. 2004 ¶ 33). This argument is based on Patent Owner's construction of the preamble which we did not adopt. *See* PO Resp. 19–21. Thus, this argument is not commensurate with the claims as properly construed.

iii. “a controller configured . . .”

Petitioner establishes by a preponderance of the evidence that Johnson teaches “a controller configured to communicate with at least one other remote wireless device via the transceiver with a preformatted message,” as recited in claim 1. Pet. 25–27; Ex. 1106, 11:2–4, 17:53–59, 18:3–55, 18:67–19:4, 29:24–34, 39:20–43, 55:49–59, Figs. 9, 43; Ex. 1103 ¶¶ 393–98.

Patent Owner argues that Petitioner fails to explain how Johnson's RCN processor is configured to receive a preformatted message from another wireless communication device and, based on a command code provided in the preformatted message, implement a certain function

corresponding to the command code, as claimed. PO Resp. 9–10. Specifically, Patent Owner argues “Petitioner had not met its obviousness burden by failing to address several claim limitations in their entirety—leaving out any allegation, much less an explanation, of how the same alleged controller performs all of the relevant claimed functions, as the law requires.” *Id.* at 26. We are not convinced by Patent Owner’s characterizations of the Petition.

For example, the Petition explains that the RCN processor “controls the RCN transmitter 418 and RCN receiver 416,” meaning that the RCN processor meets the limitation of “configured to receive a preformatted message from another wireless communication device” by controlling the communication with other devices such as receiving an “IRH message.” Pet. 25–27, 30–31 (quoting Ex. 1106:18:50–51). We determine that no more level of detail is required to show that the RCN processor receives a message.

Additionally, as to the limitation of “based on a command code provided in the preformatted message, implement a certain function corresponding to the command code,” the Petition explains that an IRH message (a preformatted message) contains “msgtype,” “SAC enable,” and “SAC” fields (command codes) that implement specific functions. Pet. 32–34. For example, the Petition contends that “[b]ased on the “msgtype” code, the RCN will implement the function of responding and sending to the IDT the “data being polled for or downloaded.” *Id.* at 33. As discussed above, the RCN processor controls the RCN transmitter and thus the sending of data. The claim only requires that the controller implement a function (such

as sending a message) based on a code being provided in the preformatted message.

The Petition contends that based on the “msgtype” code the RCN sends a message; thus the RCN processor is configured (able to) send a message when that command is sent. The claim does not require any particular way of handling the command code besides performing the function so we do not require an explanation of how the controller processes the code as long as it performs the function upon receiving a particular code, i.e. based on the code.

The Federal Circuit informs us that in our decision “the amount of explanation needed varies from case to case, depending on the complexity of the matter and the issues raised in the record.” *Rovalma, S.A. v. Bohler-Edelstahl GmbH & Co. KG*, 856 F.3d 1019, 1025 (Fed. Cir. 2017) (citing *Personal Web Technologies*, 848 F.3d at 991–94; *Ariosa Diagnostics v. Verinata Health, Inc.*, 805 F.3d 1359, 1364–67 (Fed. Cir. 2015); *In re Lee*, 277 F.3d 1338, 1342–46 (Fed. Cir. 2002)). Here, we do not discern a complexity in the claims that requires any further level of detail or explanation to show that the claim limitation is met. *Cf.*, *In re Fisher*, 427 F.2d 833, 839 (CCPA 1970) (indicating patents in the mechanical or electrical arts involve predictable factors compared to the more unpredictable chemical and biological arts).

iv. format a message comprising a receiver address comprising . . .

Petitioner establishes by a preponderance of the evidence that Johnson teaches “format a message comprising a receiver address comprising an address of at least one remote wireless device,” as recited in claim 1. Pet. 27

(citing Ex. 1106, 29:24–25, 39:28–43, 41:57–59, 42:26–28, 45:63–46:2, 55:30–59, Figs. 25, 31–32, 42–44; Ex. 1103 ¶¶ 399–402). For example, Petitioner points to Johnson’s RND message which contains an address field. *Id.* Patent Owner does not make arguments specific to this claim limitation.

v. a command indicator comprising a command code

Petitioner establishes by a preponderance of the evidence that Johnson teaches “a command indicator comprising a command code,” as recited in claim 1. Pet. 27–29. Petitioner contends that in Johnson, RND messages contain a control field that has a code for message type. *Id.*; Ex. 1106, 4:2–10, 10:36–40, 10:53–61, 18:20–29, 20:40–53, 70:24–33, Figs. 25, 31–32, 37, 43, 44, 61; Ex. 1103 ¶¶ 403–07. Patent Owner does not make arguments specific to this claim limitation.

vi. a data value comprising a message

Petitioner establishes by a preponderance of the evidence that Johnson teaches “a data value comprising a message,” as recited in claim 1. Pet. 40–42. For example, Petitioner relies on Johnson’s information field to show a data value comprising a message. Pet. 29–30; Ex. 1106, 18:24–28, 55:30–39, Figs. 43, 61; Ex. 1103 ¶¶ 408–10. Patent Owner does not make arguments specific to this claim limitation.

vii. the controller is configured to receive a preformatted message . . .

Petitioner establishes by a preponderance of the evidence that Johnson teaches “the controller is configured to receive a preformatted message from another wireless communication device, and based on a command code provided in the preformatted message, implement a certain function

corresponding to the command code,” as recited in claim 1. Pet. 30–32; Ex. 1106, 18:42–46, 22:38–55, 39:1–18, 53:38–51, 55:24–28, 56:65–57:42, 57:45–49, 57:65–58:5–43, 61:19–32, Figs. 1, 28, 50, 51; Ex. 1103 ¶¶ 411–22.

Patent Owner argues “[t]o the extent the Board finds a wireless communication device only needs to be able to communicate sensed and command data in a single direction, Petitioner still fails to establish that ‘another wireless communication device’ can communicate both command and sensed data.” PO Resp. 21. Patent Owner further argues “Petitioner fails to establish that either the IDT or neighbor RCN is ‘another wireless communication device’ that can communicate both command and sensed data.” *Id.* Patent Owner’s argument still relies on its construction that the direction of the communication is limited by the claims. We did not limit the claim to command and sense data travelling in the same direction between a wireless communication device and another wireless communication device. Patent Owner again attempts to import into the claim that the command and sense data must be communicated in a bidirectional manner between the wireless device and the “another” wireless device. Thus, this argument is not commensurate with the proper scope of the claims.

In discussing the limitation of “wherein the controller is configured to receive a preformatted message from another wireless communication device,” Petitioner explained with citations that “Johnson discloses [1.f]: the controller (e.g., “RCN processor”; *see* [1.b]) is configured to receive a preformatted message (e.g., “polling signal” formatted as an “IRH message”) from another wireless communication device (e.g., “IDT,” a

“neighbor” “RCN”).” Pet. 30. We are persuaded by this contention. Nevertheless, we do not rely on the “neighbor RCN”; rather, we rely only on the IDT. Thus, Patent Owner’s arguments regarding neighbor RCN are moot. *See* PO Resp. 21–23.

Patent Owner argues Petitioner’s challenge to claim 2–10 is deficient because of the same argument above; thus, for the same reasons discussed above we are not convinced.

Claim 2

Claim 2 depends from claim 1. Claim 2 recites “the transceiver comprises a unique transceiver address to distinguish the transceiver from other transceivers in the wireless communication system,” which Petitioner sufficiently shows to be disclosed in Johnson by a preponderance of the evidence. *See* Ex. 1106, 26:41–45, 41:29–33, 40–46; Pet. 34–35; Ex. 1103 ¶¶ 423–25. Patent Owner does not make arguments specific to this claim.

Claim 5

Claim 5 depends from claim 1. Claim 5 recites “the command code of the preformatted message [is] concatenated to provide a receiving device with multiple command codes, the device configured to perform one or more functions corresponding to the command code in the preformatted message,” which Petitioner sufficiently shows to be disclosed in Johnson by a preponderance of the evidence. *See* Ex. 1106, 10:53–61, 18:20–29, 22:45–55, 54:40–44, 55:30–67, 57:66–58:5, 58:12–38, 41–43, Fig. 50; Pet. 47–49; Ex. 1103 ¶¶ 435–42. Patent Owner does not make arguments specific to this claim.

Claim 6

Claim 6 depends from claim 1. Claim 6 recites the device of claim 1 wherein “the receiver address is scalable,” which Petitioner sufficiently shows to be disclosed in Johnson by a preponderance of the evidence.¹² *See* Ex. 1106, 38:38–39, 39:28–44; 41:45–53, 59–67, 42:18–43, 55:41–47, 49–59, Figs. 1, 35, 36, 42, 43; Pet. 40–42; Ex. 1103 ¶¶ 443–46. Patent Owner does not make arguments specific to this claim.

Claim 7

Claim 7 depends from claim 1. Claim 7 recites “data value comprises a scalable message,” which Petitioner sufficiently shows to be disclosed in Johnson by a preponderance of the evidence. *See* Ex. 1106, 31:53–56, 55:44–55, 56:28–32, 56:57–59; Pet. 42–43; Ex. 1103 ¶¶ 447–450. Patent Owner does not make arguments specific to this claim.

Claim 8

Claim 8 depends from claim 1. Claim 8 recites “the command code indicates a data request to the wireless communication device,” which Petitioner sufficiently shows to be disclosed in Johnson by a preponderance of the evidence. *See* Ex. 1106, 4:2–10, 18:23–29, 20:40–49, 55:32–36, Fig. 1, 37, 43; Pet. 43–44; Ex. 1103 ¶¶ 451–56. Patent Owner does not make arguments specific to this claim.

¹² A similar, but different, limitation is at issue in the Federal Circuit appeal. There, the pertinent claim limitation recites “a receiver address comprising a scalable address of at least one remote device.” *SIPCO, LLC v. Emerson Elec. Co.*, (Fed. Cir. 2019) (No. 18-1856).

Claim 10

Claim 10 depends from claim 1. Claim 10 recites “the command code indicates a request for a ping response by the wireless communication device,” which Petitioner does not sufficiently show to be disclosed in Johnson by a preponderance of the evidence. *See* Ex. 1106, 18:25–29, 55:32–36, 57:45–49, 55:32–36, 58:25, Fig. 1; Pet. 57–58; Ex. 1103 ¶¶ 464–69.

Patent Owner asserts a ping, as described in the specification “is well-understood to be a targeted message, requiring minimal processing, used to confirm system health or model network performance.” PO Resp. 40 (citing Ex. 1101, 11:55–12:3; Ex. 2004 ¶ 55.) Petitioner contends that using these citations would be importing a limitation into the claims. Reply 16. We are not persuaded that is the case. Rather, Patent Owner reads the specification to reveal the well-known plain understanding of a ping. Thus, we are convinced, by these citations, of Patent Owner’s characterization of a ping response.

Patent Owner argues that Johnson’s “status request,” relied on by the Petition, requires the NSM to “transmit status or other data” including “housekeeping data” that is more than a simple ping request. PO Resp. 43. Petitioner suggest a ping is a “well-known message seeking a status response from a receiving device.” Reply 16. We agree with Patent Owner that a ping is known to be minimal in nature and Petitioner’s characterization of a ping does not include this aspect of a ping and Johnson’s “status request” also does not have this aspect of a ping. Thus, we are not persuaded that Petitioner has shown claim 10 would have been obvious over Johnson.

Claim 11

Independent claim 11 recites in part “determining a location from which the duplicate message originated,” which Petitioner does not sufficiently show to be disclosed in Johnson by a preponderance of the evidence. *See* Ex. 1106, 20:13–21, 24:22–57, 27:30–54; 28:32–36, 41:44–52, 52:51–62 53:39–51, Fig. 1; Pet. 54–57; Ex. 1103 ¶¶ 493–96.

Petitioner contends “Johnson teaches RCNs determine when they receive duplicate copies of an NSM-packet signal from an NSM identified by the NSM-packet signal’s address field.” Pet. 55–56 (citing Ex. 1106, 20:13–21, 41:44–52, 52:51–62.) Petitioner further contends that this discloses “determining a location from which the duplicate message originated” “because NSMs would typically have been in a known, fixed location (e.g., where a meter or vending machine is located).” *Id.* at 56. (citing Ex. 1120, 6:3–5, 10:21–27; Ex. 1103 ¶ 496).

Patent Owner argues that Johnson discards duplicates upon receiving them and Petitioner has not explained why one of ordinary skill would correlate the address in the NSM with the actual physical location of the message. PO Resp. 47–48. We are convinced by Patent Owner’s argument. Petitioner has not shown sufficiently that Johnson determines the location of duplicate messages (that it discards) by converting a network address to a physical location.

Petitioner also contends that “Johnson teaches that RCNs can be polled either through a neighbor RCN using edge-gather or wider-gather polling, or directly by the IDT.” Pet. 56. (citing 1106, 53:39–51, Fig. 1). Petitioner further contends “Johnson further teaches that it is advantageous to minimize bandwidth consumption because, for example, ‘path loss’ and

‘path redundancy’ may cause ‘simultaneous message transmissions, or collisions’ that undermine the network’s reliability.” *Id.* at 57 (citing Ex. 1106, 24:22–57, 27:30–54; 28:32–36; Ex. 1103 ¶ 496). Because of this Petitioner contends:

A POSITA would have recognized that identifying the location of the polling IDT and RCN that transmitted the polling message would have advantageously allowed a receiving RCN to determine whether it is closer to the polling IDT or RCN. Madisetti, ¶496. A POSITA would have recognized that by identifying the location from which the RCN received duplicate polling messages, the RCN could advantageously respond to only the closer polling device (*e.g.*, IDT or RCN)—thereby reducing the impact on the system from simultaneous messages transmissions or collisions. Madisetti, ¶496.

Id. Thus, Petitioner modifies Johnson by stating one of ordinary skill would add a function to determine the physical location of the polling IDT and RCN that transmitted the polling message. This is not a modification of an existing function in Johnson but is a new function added by attorney argument and unsupported testimony from Petitioner’s declarant. Whether or not Petitioner has articulated a rationale for modifying Johnson, Petitioner improperly fills a gap in its mapping to a claim limitation.

Identifying a limitation by expert testimony and the “ordinary creativity” of one of skill in the art is improper and tantamount to using common sense. *DSS Tech. Mgmt., Inc. v. Apple Inc.*, 885 F.3d 1367 (Fed. Cir. 2018). Common sense in an obviousness analysis is “typically invoked to provide a known *motivation to combine*, not to supply a missing claim limitation.” *Arendi S.A.R.L. v. Apple, Inc.*, 832 F.3d 1355, 1361–62 (Fed. Cir. 2016). Although doing so might be permissible when “the limitation in question [is] *unusually* simple and the technology *particularly*

straightforward” (*id.* at 1362 (emphasis added)); that is not the case here. While the art is relatively predictable, Petitioner has not shown that associating a location with duplicates is a well understood function such as simply sending and receiving messages.

Additionally, under 37 C.F.R. § 42.65(a), “[e]xpert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.” It is within our discretion to assign the appropriate weight to the testimony offered by Petitioner's declarant. *In re Am. Acad. Of Sci. Tech. Ctr.*, 367 F.3d 1359, 1368 (Fed. Cir. 2004) (“[T]he Board is entitled to weigh the declarations and conclude that the lack of factual corroboration warrants discounting the opinions expressed in the declarations.”).

Thus, we are not persuaded by Petitioner’s alternate contention. For the reasons above, Petitioner has not shown by a preponderance of the evidence that claim 11 would have been obvious over Johnson.

Claims 12, 13, 15

Claims 12, 13, and 15 depend from claim 11, and thus, for the reasons above, Petitioner has not shown by a preponderance of the evidence that claims 12, 13, and 15 would have been obvious over Johnson.

Claim 16

Claim 16 recites in part “the data packet comprising a receiver address of the first wireless remote device, a command indicator comprising a command code, a data value comprising a message,” which Petitioner does not sufficiently show to be disclosed in the combination of Johnson and Cunningham by a preponderance of the evidence. *See* discussion of claims 1

and 11; Ex. 1106, 39:5–11, 41:1–17, 42:46–61, 60:40–46, Fig. 47; Pet. 64–65; Ex. 1103 ¶¶ 529–40.

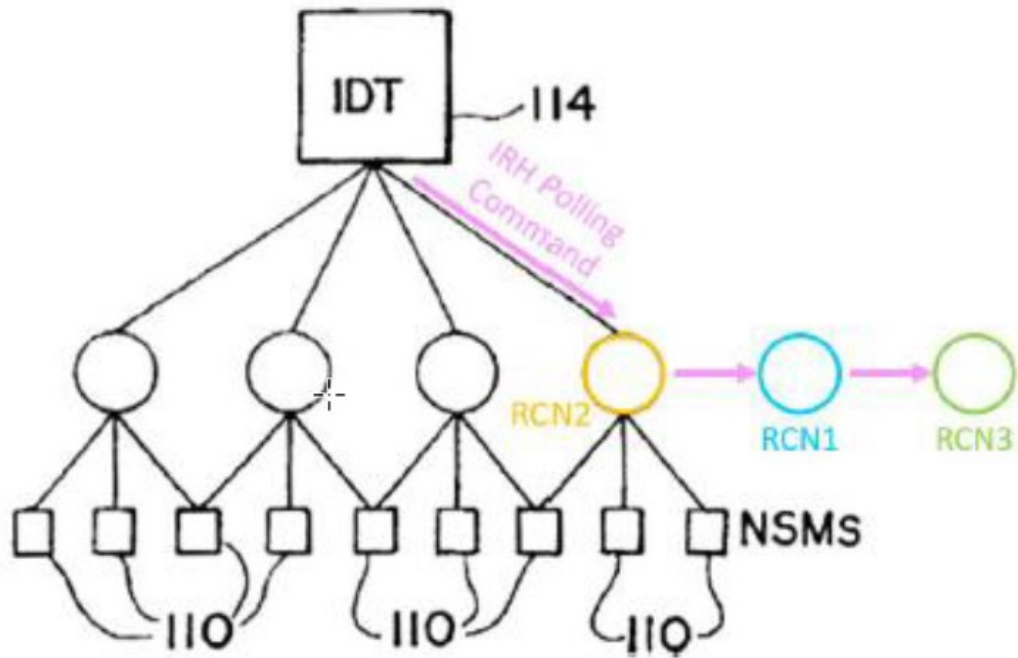
Specifically Petitioner contends:

Johnson teaches two techniques for polling RCNs not directly accessible to the IDT: “edge-gather” and “wider-gather.” For both techniques, RCNs poll “neighbor” RCNs that “could not be polled directly” by the IDT; this “neighbor” polling is done using packets that a POSITA would have understood or at least found obvious are structured similarly to IRH packets (because they serve a similar purpose and are advantageously passing along the IRH message). Madisetti, ¶526.

Pet. 61. In other words, Petitioner does not rely on an IRH packet but contends that neighbor polling would be done with “similar” packets because neighbor polling is “passing along” an IRH packet. *Id.* Patent Owner argues Johnson does not state neighbor polling uses IRH packets, which Petitioner admits. PO Resp. 54; Pet. 61. Patent Owner also characterizes Petitioner’s contentions as “conclusory” and points out that Johnson discloses that different messages are sent depending on the device to which and from which the messages are sent using a three-letter labels formatted as [source][destination][message type]. PO Resp. 54. Patent Owner has not explained why it is unreasonable that one of skill in the art would implement messages similar to other messages in the Johnson system to accomplish the edge-gather function. Additionally, the fact that Johnson has a naming system for messages does not address whether Johnson would use messages similar to IRH messages for its edge gather function.

Claim 16 requires the first wireless device to both *receive* data from a second wireless device and to be associated with a controller configured to *send* a preformatted message to at least one other remote wireless device.

To show this functionality, Petitioner relies on an annotated version of Johnson's Figure 1, reproduced below, to show an RCN that both sends and receives messages to neighbor RCNs. Pet. 67.



Reproduced above is Petitioner's annotated version of Figure 1, showing the text "IRH Polling Command" indicated in purple with purple arrows going in one direction from the IDT to an RCN, from the original figure 1, labeled as RCN2 (in yellow) to an additional RCNs labeled RCN 1 (in light blue), and then to a third RNC labeled RCN 3 (in green).

Petitioner cites to Johnson at column 53 lines 38 to 51. Pet. 67 (citing Ex. 1106, 53:38–51). The text at that citation, however, does not describe the scenario depicted in the annotated Figure. The cited text recites, for edge gather, "a remote cell node . . . poll[s] one or more edge neighbors," and for wider-gather, "remote cell nodes . . . poll their neighbors in some manner." Ex. 1106, 53:38–51. Thus, Johnson does not disclose an RCN receiving and sending information between 3 RCNs as depicted in the annotated figure.

Petitioner, in its Reply, contends “[u]sing ‘wider-gather’ polling, ‘messages from 25 [RCNs]’ end up in ‘only four [RCNs]’—meaning that messages from multiple different RCNs are consolidated into and stored in a single RCN, which polls the others using the chain shown [in the annotated Figure 1].” Reply 22–23. We are not persuaded by Petitioner’s contention. Johnson does not explain how the RCNs receive the 25 messages but suggest that they are from an RCN’s neighbor not its neighbor’s neighbor. See Sur-Reply 22. Petitioner maintains that

A POSITA would have understood that this is the point of ‘*wider-gather*’ polling: to allow polling over a wider area that IDTs cannot reach. [Ex. 1106, 53:39–51; Ex. 1103 ¶¶ 518–20]. A POSITA likewise would have understood and at least found it obvious, based on Johnson’s teaching of ‘edge neighbor[s],’ that neighbors like RCN3 above could be even further removed from the nearest IDT.

Reply 22–23. This is attorney argument that is not based in disclosures from Johnson. Johnson simply states that in wider gather an RCN can accumulate multiple messages from its neighbors. Thus, we are persuaded by Patent Owner’s argument.

For the reasons above, Petitioner has not shown by a preponderance of the evidence that claim 16 would have been obvious over Johnson.

Claims 17–20

For the reasons above, Petitioner has not shown by a preponderance of the evidence that claims 17–20 that depend from claim 16 would have been obvious over Johnson.

Claims 22, 24

Independent claim 22 recites in part “a function code corresponding to function status of a device co-located with the transceiver,” which Petitioner

does not sufficiently show to be disclosed in Johnson by a preponderance of the evidence. *See* discussion of claim 19; Ex. 1106, 5:58–67, 16:57–65, Fig. 2; Pet. 89–90; Ex. 1103 ¶¶ 361–66.

The Petitioner contends “Johnson discloses a function code (*e.g.*, command code in ‘signalling data’) corresponding to function status (*e.g.*, status of ‘load’) of a device (*e.g.*, ‘load,’ ‘thermostat’) co-located with the transceiver.” Pet. 88 (citing Ex. 1103 ¶¶ 641–42). Patent Owner argues that Petitioner does not explain or point to disclosure that the thermostat would be co-located with the transceiver. We are convinced by Patent Owner’s argument. In its Reply, Petitioner says that the code relates to the status of a device in the “premises” with the transceiver, quoting a citation in the Petition that is not explained in the Petition. Reply 25. We determine that an unexplained reference to a device at the premises with another device is not sufficient to meet the limitation to co-locate. Thus, Petitioner has not shown that claim 22 and claim 24 that depends from it would have been obvious over Johnson.

B. Obviousness of Claims over Johnson and Cunningham

Petitioner contends that claims 3, 4, 9, 14, and 16–24 are unpatentable under 35 U.S.C. § 103(a) as obvious over Johnson and Cunningham. Pet. 5. To support its contentions, Petitioner provides explanations as to how the prior art allegedly teaches each claim limitation. *Id.* at 35–36, 44–47, 59–94. On the present record, Petitioner articulates sufficient reasons for combining Johnson and Cunningham. *Id.* at 25–26. For example, Petitioner contends that:

A [person of ordinary skill in the art] would have been motivated to apply Cunningham’s teachings of (a) an “Internet

Protocol” address and (b) using DRMs as repeaters interfaced with devices such as sensors or actuators such as “thermostats” in implementing Johnson’s system by (a) implementing Johnson’s addresses using IP addresses; and (b) including sensors and actuators in Johnson’s RCNs. Madisetti, ¶105.

First, Johnson states that “modifications can be made” to its teachings. Johnson, 73:54-61. Second, Johnson and Cunningham are both directed to AMR systems. Johnson, 3:21-23; Cunningham, 1:15-18. Third, Cunningham explicitly cites Johnson as prior art, and states that Cunningham’s teachings can be applied to improve Johnson’s “complicated” teachings by advantageously reducing the need for “second layer information retrieval” (e.g., by also allowing RCNs themselves to collect data) and by “simplif[ying]” the system by, e.g., allowing devices to repeat information, thereby reducing the number of IDTs needed in the system; and providing teachings of how to implement addresses using the advantageously well understood and common IP address format. Cunningham, 3:29-4:44, 6:11-13, 6:26-29, 9:66-10:9, 33:45-53, 42:42-51, Figs. 25, 49. A [person of ordinary skill in the art] also would have recognized that TCP/IP addressing would have advantageously allowed Johnson’s system to be more easily capable of communicating with a “variety of” different types of networked devices because the addressing scheme would be transparent between different networks. *E.g.*, Johnson, 25:59-67. Fourth, a [person of ordinary skill in the art] would have found it straightforward to apply Cunningham’s teachings relating to DCMs and DRMs in implementing Johnson’s RCNs because the devices serve similar purposes in each system using similar structures—namely, by collecting sensor information from several remote devices . . .

Johnson, Fig. 1, 53:39-51 Cunningham, Fig. 1, 4:56-62[,] Madisetti, ¶106. Fifth, a [person of ordinary skill in the art] would have been motivated to look to Cunningham’s teachings of using the DCM as a repeater for other DCMs for additional teachings of how to implement Johnson’s “edge-gather” and “wider gather” polling including, *e.g.*, how to implement addresses in packets used for these polling techniques to reliably relay messages between devices. Johnson, 53:39-51; Cunningham, Figs. 46-47, 41:44-44:11. A [person of ordinary

skill in the art] further would have recognized this straightforward/predictable combination (yielding the claimed features) would have worked as expected. Madisetti, ¶¶66.

Id. at 15–17.

Claim 3

Claim 3 depends from claim 2. Claim 3 recites “the unique transceiver address is an Internet Protocol address,” which Petitioner sufficiently shows to be disclosed in Johnson and Cunningham by a preponderance of the evidence. *See* Ex. 1107, 34:66–35:17; Pet. 35; Ex. 1103 ¶¶ 426–29. Patent Owner does not make arguments specific to this claim.

Claim 4

Claim 4 depends from claim 1. Claim 4 recites “the function code further comprises an Internet Protocol address,” which Petitioner sufficiently shows to be disclosed in Johnson and Cunningham by a preponderance of the evidence. *See* discussion of claim 3 above; Ex. 1107, 14:41–43, 34:66–35:23, 36:1–38; 37:47, 37:35–38, 38:8–9; Pet. 35–36; Ex. 1103 ¶¶ 430–32. Patent Owner does not make arguments specific to this claim.

Claim 9

Claim 9 depends from claim 1. Claim 9 recites “the command code indicates a change in settings of an actuator associated with the wireless communication device,” which Petitioner sufficiently shows to be disclosed in Johnson and Cunningham by a preponderance of the evidence. *See* Ex. 1106, 10:2–9, 53–56, 58:28–29, 58:35–43, Figs. 4, 51; Ex. 1107, 4:58–62, 6:11–13, 6:26–29, 9:66–10:9, 14:50–56, 19:49–51, 46:64–47:10, Fig. 19; Pet. 44–47; Ex. 1103 ¶¶ 457–63.

The Petition states Johnson “teaches that an IRH message includes a ‘SAC command’ that controls actuators such as a ‘load’—e.g., an air conditioner, heater, or pump—or connects/disconnects service.” Pet. 45. Patent Owner argues that “[a]ctuators can be standalone devices or integrated into loads, but either way, they are not the load itself.” PO Resp. 31. Petitioner also states that an actuator is a “switch for service.” Pet. 45. However, the Petition does not explain what this switch is or how it operates as an actuator. Nevertheless, the Petition relies on disclosures from Cunningham as well.

The Petition also relies on an “intelligent thermostat” in Cunningham’s provisional as the actuator because it can control other equipment, e.g. “ECMs” (which Cunningham refers to as “device adjustment modules”) as an “intelligent thermostat” or to “control”—i.e., actuate, HVAC and lighting equipment.” Pet. 46 n. 6. Cunningham states “[t]he present application is related to U.S. Provisional Patent Application Ser. No. 60/058,978, . . . and U.S. Provisional Patent Application No. 60/094,057, . . . which are incorporated herein by reference.” Ex. 1107, 1:5–10.

Patent Owner argues Cunningham did not incorporate the entire provisional citing *Zenon Env'tl., Inc. v. U.S. Filter Corp.*, 506 F.3d 1370, 1378 (Fed. Cir. 2007) (“*Zenon*”). *Zenon* does not stand for that proposition. While *Zenon* states that an incorporation by reference “must identify with detailed particularity what specific material it incorporates and clearly indicate where that material is found in the various documents” (*id.* (quoting *Cook Biotech Inc. v. Acell, Inc.*, 460 F.3d 1365, 1376 (Fed. Cir. 2006))), it does not, however, state that documents cannot be incorporated in their

entirety—because they can. *See Paice LLC v. Ford Motor Co.*, 881 F.3d 894, 907 (Fed. Cir. 2018) (finding similar language “plainly sufficient to incorporate [a reference] in its entirety.”). Thus, we are not convinced by that argument.

Patent Owner also argues “the portions of Cunningham’s provisional application cited by Petitioner fail to provide any motivation to modify Johnson to associate an actuator with Johnson’s RCN.” PO Resp. 39–40; *see also* Sur- Reply 14 (similar argument). Nevertheless, the Petition states “Cunningham further teaches using an actuator such as a thermostat instead of a sensor for a device connected to a SIM (or a DCM).” Pet. 45–46. In a footnote at the end of that sentence the Petition states that the provisional uses ECMs as an “intelligent thermostat,” thus it is clear that the “intelligent thermostat” replaces the thermostat of Cunningham. *Id.* at 46 n. 6.

No motivation to combine analysis is required because the disclosures of the provisional are incorporated by reference into Cunningham. “When a document is ‘incorporated by reference’ into a host document, such as a patent, the referenced document becomes effectively part of the host document as if it were explicitly contained therein.” *Telemac Cellular Corp. v. Topp Telecom, Inc.*, 247 F.3d 1316, 1329 (Fed. Cir. 2001). Additionally, as explained below, we are persuaded by Petitioners contention that one of skill in the art would be motivated to combine Cunningham’s disclosure with Johnson to associate RCNs with NSMs and thus also with physical devices such as a thermostat.

Based on the analysis above, we are persuaded that Petitioner has shown by a preponderance of the evidence that the combination of Johnson and Cunningham shows an actuator as claimed.

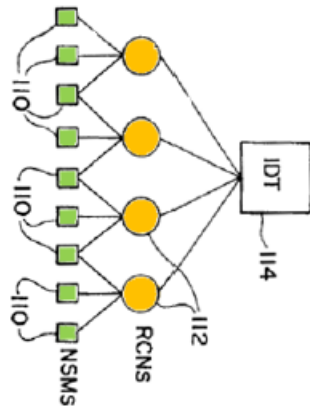
Patent Owner further argues Johnson discloses network applications (i.e., software as opposed to a physical actuator like an ON/OFF switch) for connecting and disconnecting service.” Sur-Reply 12. Patent Owner has not explained sufficiently why the claim is limited to a physical actuator as opposed to a software actuator. Thus, we are not persuaded by this argument.

Patent Owner also argues that “an actuator associated with the wireless communication device” must be physically located at the wireless communication device. PO Resp. 31–32. Patent Owner argues the command signal Petitioner relies on is sent from the RCN to a separate NSM that is physically located where a device, such as a meter, is located. *Id.*

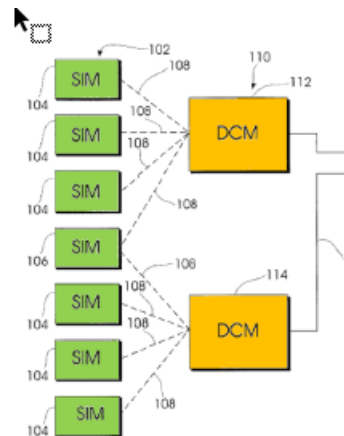
Nevertheless, Petitioner relies on Johnson combined with Cunningham. The Petition states “[i]t would have been obvious to apply these teachings in implementing Johnson’s RCNs, yielding an RCN directly connected to (and therefore associated with) an actuator load or service control.” Pet. 46. The Petition also states “NSMs ‘include meter service modules for electricity, gas and water, a service disconnect module, a load management module, an alarm monitoring module.’” *Id.* (quoting Ex. 1106, 10:2–9).

The Petition states Cunningham discloses a SIM “hard wired” to a DCM and discloses a thermostat connected to a SIM. Pet. 45. Thus, the Petition states explicitly the DCM, SIM, and thermostat are connected. *Id.* As to the combination of Johnson and Cunningham, the Petition states a person of ordinary skill in the art “would have found it straightforward to apply Cunningham’s teachings relating to DCMs and DRMs in implementing Johnson’s RCNs because the devices serve similar purposes in each system using similar structures—namely, by collecting sensor

information from several remote devices.” Pet. 16. The Petition then illustrates, in side-by-side annotated versions of Figure 1 of Johnson and Figure 1 of Cunningham, reproduced below, that the SIMs in Cunningham serve a similar purpose and have a similar structure to the NSMs in Johnson. Pet. 17.



Johnson, Fig. 1, 53:39-51



Cunningham, Fig. 1, 4:56-62

Side-by-side, annotated versions of Figure 1 of Johnson and Figure 1 of Cunningham reproduced above, show Johnson Figure 1 with RCNs in yellow connected to multiple NSMs in green and Cunningham Figure 1 with DCMs in yellow connected to multiple SIMs in green. Thus, although it is not explicitly stated in the Petition that the NSM is connected to the RCN, we determine that it was sufficiently apparent from the part of the Petition cited above that, in the combination of Johnson and Cunningham, the SIM replaces the NSM in order to have a “RCN directly connected to (and therefore associated with) an actuator.” *Id.* at 46. Thus, the Petition proposes directly connecting the physical device to the RCN which would

result in the NSM also being physically connected to the RCN. Reply 14.¹³ In its Reply, Petitioner explains sufficiently how this is shown in the Petition. Reply 11–15. Patent Owner does not respond to this explanation in its Sur-Reply, rather simply argues “Johnson discloses that its alleged actuators are only associated with NSMs, not RCNs, so Petitioner has not carried its burden. (PO[Response] 30-33.)” Sur-Reply 13. We are not convinced by this argument.

We do not rely, however, on Petitioner’s assertion in the Reply that “[t]he actuator is ‘associated with’ the RCN because the IDT sends SAC commands used to control an actuator through its associated RCN,” thus suggesting that the actuator need not be physically located at the RCN. Reply 12. Thus, Patent Owner’s arguments regarding this contention are moot. PO Resp. 12–13.

Petitioner argues that “Cunningham explicitly cites Johnson as prior art, and states that Cunningham’s teachings can be applied to improve Johnson’s ‘complicated’ teachings by advantageously reducing the need for ‘second layer information retrieval’ (e.g., by also allowing RCNs themselves to collect data).” Pet. 15–16. Patent Owner argues the entire quote from Cunningham recites “Cunningham states that “[t]he prior art as evidenced by the described patents suffers from excessive duplicate information transmission, *required polling for second layer information retrieval*, being

¹³ Patent Owner admits that the portion of Johnson cited in the Petition states “Johnson explains that “[e]ach network service module [NSM] is coupled to a respective physical device.” PO Resp. 32 (quoting Ex. 1106, 14:3–4). We determine that this fact would tend to support the Petition but we do not rely on this portion of Johnson to support Petitioner’s contention because it was not cited in the Petition.

overly complicated, and having excessive parts which are susceptible to failure.” PO Resp. 34 (quoting Ex. 1107, 4:34–38.) Based on this, Patent Owner argues polling was the problem addressed by Cunningham not the separation between RCNs and NSMs. *Id.* Patent Owner further argues “Cunningham focuses on using data collection modules 110 [DCMs] to collect information from a plurality of different sensor modules [SIMs].” *Id.* at 35. Nevertheless, the Petition cites to a part of Cunningham that suggests directly connecting SIMs to a DCM, i.e. “Cunningham teaches associating a device with a DCM by either hard-wiring a dedicated SIM to that DCM, or directly connecting the device to the DCM.” Pet. 45 (citing Ex. 1107, 6:11–13, 6:26–29, 9:66–10:9).

Patent Owner also argues through its declarant that “the industry” preferred the one RCN to many NSMs approach in Johnson and Cunningham suggests that same approach. PO Resp. 35–36. Patent Owner is essentially arguing that there is a teaching away from Petitioner’s combination. Patent Owner does not cite any authority to support that general industry preference that is not recited in the cited references on which an obviousness challenge is predicated can teach away from a proposed obviousness combination.

“Under the proper legal standard, a reference will teach away when it suggests that the developments flowing from its disclosures are unlikely to produce the objective of the applicant’s invention. A statement that a particular combination is not a preferred embodiment does not teach away absent clear discouragement of that combination.” *Syntex (U.S.A.) LLC v. Apotex, Inc.*, 407 F.3d 1371, 1380 (Fed. Cir. 2005) (citations omitted). Additionally, the “mere disclosure of alternative designs does not teach

away.” *In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004); *see also Meiresonne v. Google, Inc.*, 849 F.3d 1379, 1382 (Fed. Cir. 2017) (“A reference that ‘merely expresses a general preference for an alternative invention but does not criticize, discredit, or otherwise discourage investigation into’ the claimed invention does not teach away.” (quoting *Galderma Labs., L.P. v. Tolmar, Inc.*, 737 F.3d 731, 738 (Fed. Cir. 2013))). Rather, teaching away requires “clear discouragement” from implementing a technical feature. *In re Ethicon, Inc.*, 844 F.3d 1344, 1351 (Fed. Cir. 2017). Here, Cunningham seems to present both configurations at issue; Johnson does not criticize associating RCNs with NSMs, and the industry preference is, at best, just that, a preference. Thus, we are not convinced by this argument by Patent Owner.

We acknowledge even if a reference is not found to teach away, its statements regarding preferences are relevant to a finding regarding whether a skilled artisan would be motivated to combine that reference with another reference. *See Apple Inc. v. Samsung Elecs. Co.*, 839 F.3d 1034, 1051 n.15 (Fed. Cir. 2016) (en banc) (noting that, even if a reference “does not teach away, its statements regarding users preferring other forms of switches are relevant to a finding regarding whether a skilled artisan would be motivated to combine the slider toggle in” that reference with the invention of a second reference). As such, in determining motivation to combine “the benefits, both lost and gained, should be weighed against one another.” *Winner Int’l Royalty Corp. v. Wang*, 202 F.3d 1340, 1349 n.8 (Fed. Cir. 2000) (“*Winner*”).

Here, on the other side of the scale, Petitioner argues there were many motivations recited in the Petition, such as Johnson teaching making

“modifications” to its system; both references are directed to similarly-structured AMR systems, and applying Cunningham’s teachings would simplify the system. Reply 15. Patent Owner discounts these motivations because they are not directed to the specific modification Petitioner is proposing. Sur-Reply 13–14. Nevertheless, Petitioner argues “[a]pplying Cunningham’s teachings of integrating sensors directly with RCNs also simplifies the system by reducing the number of discrete NSMs in the system, which also reduces the amount of “required polling” of NSMs. Reply 15 (citing Ex. 1107, 4:34–38; Pet. 15–17. Ex. 1176 ¶ 35. Weighing all the evidence above, we are persuaded that Petitioner has shown sufficient motivation to combine Johnson and Cunningham. Thus, for the reasons above, Petitioner has shown by a preponderance of the evidence that claim 9 would have been obvious over the combination of Johnson and Cunningham.

Claim 14

Claim 14 depends from claim 13, which, as explained above, Petitioner does not sufficiently show to be disclosed in Johnson by a preponderance of the evidence. Petitioner does not rely on Cunningham to make up any deficiency as to the limitations of claim 13. Thus, Petitioner has not shown claim 14 is disclosed in the combination Johnson and Cunningham by a preponderance of the evidence.

Claim 16

Independent claim 16 recites “a communication system to communicate command and sensed data between remote devices, the system comprising,” which Petitioner contends is disclosed in the combination of

Johnson and Cunningham. *See* discussion of preamble associated with claim 1; Pet. 60; Ex. 1103 ¶¶ 521–22.

As explained above, we determined that the preamble is not limiting but we rely on Petitioner’s contentions cited above as a predicate of the contentions below, so they are listed here. Patent Owner’s arguments regarding the preamble are not commensurate with the scope of the invention as properly construed. *See* PO Resp. 58–59.

Claim 16 further recites “a receiver associated with a first wireless remote device the receiver configured to receive a data packet transmitted by a second wireless remote device,” which Petitioner sufficiently shows to be disclosed in Johnson by a preponderance of the evidence. *See* discussion of claim 1; Pet. 60–64; Ex. 1103 ¶¶ 523–28.

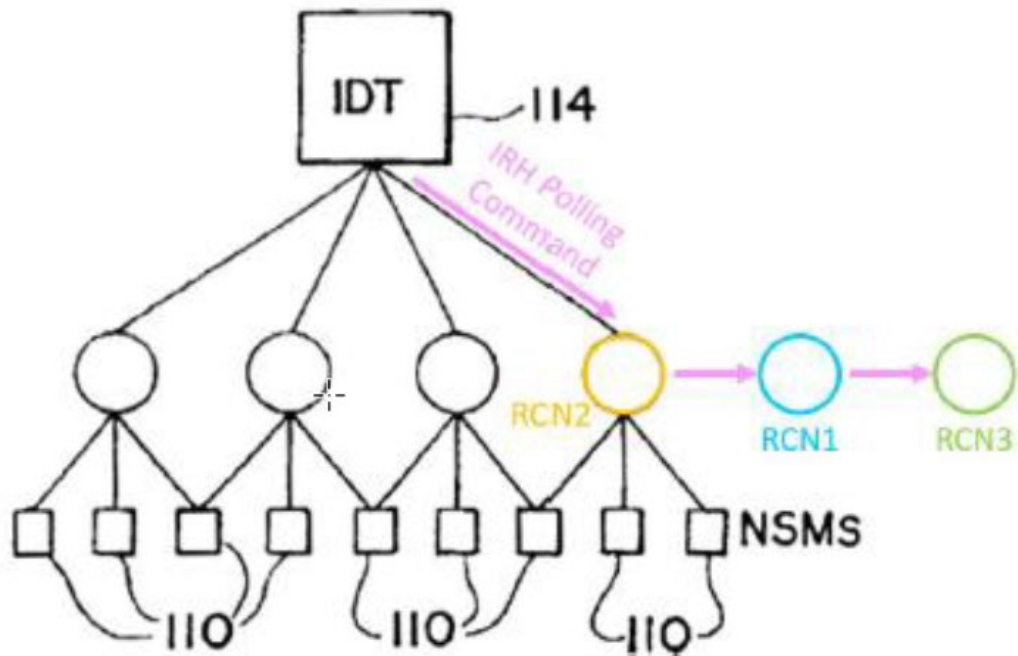
Claim 16 further recites “the data packet comprising a receiver address of the first wireless remote device, a command indicator comprising a command code, a data value comprising a message,” which Petitioner sufficiently shows to be disclosed in the combination of Johnson and Cunningham by a preponderance of the evidence. *See* discussion of claim 1 and 11; Ex. 1106, 39:5–11, 41:1–17, 42:46–61, 60:40–46, Fig. 47; Pet. 64–65; Ex. 1103 ¶¶ 529–40.

Specifically Petitioner contends:

Johnson teaches two techniques for polling RCNs not directly accessible to the IDT: “edge-gather” and “wider-gather.” For both techniques, RCNs poll “neighbor” RCNs that “could not be polled directly” by the IDT; this “neighbor” polling is done using packets that a POSITA would have understood or at least found obvious are structured similarly to IRH packets (because they serve a similar purpose and are advantageously passing along the IRH message). Madisetti, ¶526.

Pet. 61. In other words, Petitioner does not rely on an IRH packet but contends that neighbor polling would be done with “similar” packets because neighbor polling is “passing along” an IRH packet.

Claim 16 requires the first wireless device to both *receive* data from a second wireless device *and* to be associated with a controller configured to *send* a preformatted message to at least one other remote wireless device. To show this functionality Petitioner relies on an annotated version of Johnson’s Figure 1, reproduced below, to show an RCN that both sends and receives messages to neighbor RCNs. Pet. 67.



Reproduced above is Petitioner’s annotated version of Figure 1, showing the text “IRH Polling Command” indicated in purple with purple arrows going in one direction from the IDT to an RCN, from the original figure 1, labeled as RCN2 (in yellow), to an additional RCN labeled RCN 1 (in light blue), and then to a third RCN labeled RCN 3 (in green). Petitioner cites to Johnson at column 53 lines 38 to 51. Pet. 67 (citing Ex. 1106,

53:38–51). The text at that citation, however, does not describe the scenario depicted in the annotated Figure. The cited text recites, for edge gather, “a remote cell node . . . poll[s] one or more edge neighbors,” and for wider-gather, “remote cell nodes . . . poll their neighbors in some manner.” Ex. 1106, 53:38–51. Thus, Johnson does not disclose an RCN receiving and sending information between three RCNs as depicted in the annotated figure.

Nevertheless, Petitioner relies on Cunningham to show the message structure in the annotated figure. Specifically, Petitioner contends

Cunningham teaches that data collection modules (DCMs), which operate similarly to Johnson’s RCNs, are wireless remote devices that include a receiver and can send and receive packets to other DCMs by acting as ‘data repeater module’ (‘DRM’) repeaters. Pet. 63–64 (citing Ex. 1107, 33:45–53, 42:34–51, Figs. 25, 49). For example, Cunningham recites “data repeater system . . . was designed for bi-directional communication between [DCM] processors.

Ex. 1107, 33:45–53.

Patent Owner argues “nowhere does Petitioner propose modifying *Johnson*’s disclosure of neighbor polling to allow polling of more than one RCN.” PO Resp. 58 (citing Ex. 2004 ¶ 80.) However, Petitioner contends that *Cunningham* provides “implementation details for implementing this polling,” which refer to *Johnson*’s polling. Pet. 62 *see* Petition at 67–68; Ex. 2004 ¶ 80. PO Resp. 58. Additionally, we discern that Petitioner’s contentions regarding claim 16 contends that the DCMs of Cunningham would be RCN1, RCN2, RCN3. Pet. 63–64, 67–68. Petitioner contends in its Reply, that “Cunningham discloses DCMs repeating information from one to another, and describes including the DCM addresses as additional information in the packet to allow the message to be repeated to a network-

connected DCM.” Reply 23; Pet. 62–64; Ex. 1107, 33:17–25, 33:45–53 Fig. 47; Ex. 1176 ¶ 48. We are persuaded by this argument.

Besides the argument above, Patent Owner does not specifically argue in its Patent Owner Response that the Petition fails to provide a motivation to combine Johnson and Cunningham with regard to the limitations of claim 16. For the first time in its Sur-Reply, Patent Owner makes further arguments that “teaching that particular elements from *Cunningham* could be beneficial in *Johnson* does not supply a rationale for Petitioner to modify *Johnson* using unrelated *Cunningham* features.” Sur-Reply 23. Patent Owner cites to its discussion of motivation to combine with regard to the actuator in claim 9 at pages 34–35 of the Patent Owner Response to justify these new arguments regarding claim 16 appearing in the Sur-Reply. We are not convinced that the arguments regarding claim 9 were associated in any way with claim 16 in the Patent Owner Response, thus those arguments are waived. *See Practice Guide Update* at 15.

Claim 16 further recites “a controller associated with the first wireless remote device comprising a transceiver configured to send and receive wireless signals,” which Petitioner sufficiently shows to be disclosed in Johnson by a preponderance of the evidence. *See discussion of claim 1*; Pet. 65; Ex. 1103 ¶¶ 542–45.

Patent Owner argues Petitioner’s challenge to claim 16 is deficient because of the same argument above with regard to tying specific functions to Johnson’s controller (PO Resp. 59–60; thus, for the same reason discussed above, including that Patent Owner request more detail than is required, given the technology at issue, we are not convinced by that argument.

Claim 16 further recites “the first wireless remote device configured to send a preformatted message comprising the receiver address, a command indicator, and the data value via the transceiver to at least one other remote device,” which Petitioner sufficiently shows to be disclosed in Johnson by a preponderance of the evidence. *See* discussion of claim 1; Pet. 66–69; Ex. 1103 ¶¶ 546–54. Patent Owner does not make arguments specific to this claim limitation.

Claim 16 further recites “the controller is configured to implement a certain function corresponding to the command code in the data packet,” which Petitioner sufficiently shows to be disclosed in Johnson by a preponderance of the evidence. *See* discussion of claim 1; Pet. 69; Ex. 1103 ¶¶ 556–57. Patent Owner does not make arguments specific to this claim limitation.

Claim 17

Claim 17 depends from claim 16. Claim 17 recites “a plurality of transceivers each having a unique address, the transceiver being one of the plurality of transceivers,” which Petitioner sufficiently shows to be disclosed in Johnson by a preponderance of the evidence. *See* discussion of claims 1 and 2; Ex. 1106, 22:20–51, Fig. 10; Pet. 69–70; Ex. 1103 ¶¶ 558–60. Patent Owner does not make arguments specific to this claim limitation.

Claim 17 further recites “a plurality of controllers associated with at least one of the transceivers, the controller being in communication with at least one other transceiver with a preformatted message,” which Petitioner sufficiently shows to be disclosed in Johnson by a preponderance of the evidence. *See* discussion of claims 1 and 16; Ex. 1106, 10:10–11:4, 18:3–

46, 22:21–23:3, Figs. 1–2, 9–10; Pet. 70–71; Ex. 1103 ¶¶ 561–64. Patent Owner does not make arguments specific to this claim limitation.

Claim 17 further recites “at least one sensor associated with at least one of the transceivers to detect a condition and output a data signal to the transceiver,” which Petitioner sufficiently shows to be disclosed in Johnson by a preponderance of the evidence. *See* discussion of claim 12; Ex. 1106, 9:66–10:6, 10:29–33, 11:4–16, 11:27–30, 54:50–55:30, Figs. 1–2; Pet. 70–72; Ex. 1103 ¶¶ 565–68. Patent Owner does not make arguments specific to this claim limitation.

Claim 17 further recites “at least one actuator associated with at least one of the transceivers to activate a device,” which Petitioner sufficiently shows to be disclosed in Johnson by a preponderance of the evidence. *See* discussion of claim 9; Ex. 1106, 10:31–33, 14:50–56, 58:35–43, Fig. 1–2; Pet. 73; Ex. 1103 ¶¶ 569–72. Patent Owner does not make arguments specific to this claim limitation.

Claim 18

Claim 18 depends from claim 16. Claim 18 recites “the controller sends the preformatted message via an associated transceiver,” which Petitioner sufficiently shows to be disclosed in Johnson by a preponderance of the evidence. *See* discussion of claims 1 and 16; Pet. 73; Ex. 1103 ¶¶ 573–75. Patent Owner does not make arguments specific to this claim limitation.

Claim 18 further recites “at least one transceiver sends the preformatted response message,” which Petitioner sufficiently shows to be disclosed in Johnson, by a preponderance of the evidence. *See* discussion of claims 1 and 16; Ex. 1106, 11:49–52, 29:24–34, Figs. 1, 40; Pet. 73–74; Ex.

1103 ¶¶ 576–79. Patent Owner does not make arguments specific to this claim limitation.

Claim 19

Claim 19 depends from claim 16. Claim 19 recites “the preformatted message is concatenated with function codes to provide the receiving device with multiple function codes, the device configured to perform the functions in the preformatted message,” which Petitioner sufficiently shows to be disclosed in the combination of Johnson and Cunningham, by a preponderance of the evidence. *See* discussion of claims 5 and 16; Pet. 75–77; Ex. 1103 ¶¶ 380–84. Patent Owner does not make arguments specific to this claim.

Claim 20

Claim 20 depends from claim 16. Claim 20 recites “at least one transceiver receives the preformatted message requesting sensed data,” which Petitioner sufficiently shows to be disclosed in Johnson by a preponderance of the evidence. *See* discussion of claims 1 and 16; Ex. 1106, 4:32–39, 22:45–55, 57:45–49, Fig. 1; Pet. 78–79; Ex. 1103 ¶¶ 588–91. Patent Owner does not make arguments specific to this claim limitation.

Claim 20 further recites “confirms the receiver address as its own unique address,” which Petitioner sufficiently shows to be disclosed in Johnson and Cunningham by a preponderance of the evidence. Ex. 1106, 36:15–16, 35:65–66, 42:39–43, 42:3–4; Pet. 79–80; Ex. 1103 ¶¶ 592–95, 98. Patent Owner does not make arguments specific to this claim limitation.

Claim 20 further recites “receives a sensed data signal,” which Petitioner sufficiently shows to be disclosed in Johnson by a preponderance of the evidence. *See* discussion of claims 11 and 17; Pet. 80; Ex. 1103

¶¶ 599–601. Patent Owner does not make arguments specific to this claim limitation.

Claim 20 further recites “formats the sensed data signal into scalable byte segments,” which Petitioner sufficiently shows to be disclosed in Johnson by a preponderance of the evidence. *See* discussion of claim 16; Ex. 1106, 56:65–57:11, 56:51–57:11, Fig. 1, 46–49; Pet. 80–82; Ex. 1103

¶¶ 602–05. Patent Owner does not make arguments specific to this claim limitation.

Claim 20 recites “determines the number of segments required to contain the sensed data signal,” which Petitioner sufficiently shows to be disclosed in Johnson by a preponderance of the evidence. Ex. 1106, 56:40–41, 57:4, 15–17, Fig. 46–48; Pet. 82–83; Ex. 1103 ¶¶ 606–09. Patent Owner does not make arguments specific to this claim limitation.

Claim 20 further recites “generates and transmits the preformatted response message comprising at least one packet,” which Petitioner sufficiently shows to be disclosed in Johnson by a preponderance of the evidence. *See* discussion of claim 18; Ex. 1106, 56:35–57:11; Figs. 1, 46; Pet. 83–84; Ex. 1103 ¶¶ 610–14. Patent Owner does not make arguments specific to this claim limitation.

Claim 21

Claim 21 depends from claim 16. Claim 21 recites “wherein the unique address of at least one receiver is an Internet Protocol address,” which Petitioner sufficiently shows to be disclosed in Johnson by a preponderance of the evidence. *See* discussion of claim 3; Pet. 84; Ex. 1103 ¶¶ 615–17. Patent Owner does not make arguments specific to this claim.

Claim 22

Independent claim 22 recites “[a] wireless communication device for use in a communication system to communicate commands and sensed data between remote wireless communication devices, the wireless communication device comprising,” which Petitioner contends is disclosed in Johnson and Cunningham. *See* discussion of claim 1; Pet. 87; Ex. 1103 ¶¶ 339–41.

As explained above, we determined that the preamble is not limiting but we rely on Petitioner’s contentions cited above as a predicate of the contentions below, so they are listed here. Patent Owner’s arguments regarding the preamble are not commensurate with the scope of the invention as properly construed. *See* PO Resp. 63–64.

Claim 22 further recites “a transceiver configured to send and receive wireless communications,” which Petitioner sufficiently shows to be disclosed in Johnson and Cunningham by a preponderance of the evidence. *See* discussion of claim 1; Pet. 87; Ex. 1103 ¶¶ 342–44. Patent Owner does not make arguments specific to this claim limitation.

Claim 22 further recites “a controller, operatively coupled to the transceiver, configured to communicate with at least one other remote wireless device via the transceiver with a preformatted message,” which Petitioner sufficiently shows to be disclosed in Johnson and Cunningham by a preponderance of the evidence. *See* discussion of claim 1; Ex. 1106, 5:59–64, Fig. 2; Ex. 1005, 4:42–57, Fig. 4; Pet. 87–88; Ex. 1103 ¶¶ 345–47. Patent Owner does not make arguments specific to this claim limitation.

Claim 22 further recites “the controller further configured to receive and format data messages,” which Petitioner sufficiently shows to be disclosed in Johnson by a preponderance of the evidence. *See* discussion of

claim 1; Pet. 88; Ex. 1103 ¶¶ 348–50. Patent Owner does not make arguments specific to this claim limitation.

Claim 22 further recites “wherein data messages comprising a receiver address comprising an address of at least one remote wireless device,” which Petitioner sufficiently shows to be disclosed in Johnson by a preponderance of the evidence. *See* discussion of claims 1 and 16; Ex. 1106, 6:44–54, 10:1–11, 10:35–40; Pet. 88–89; Ex. 1103 ¶¶ 351–54. Patent Owner does not make arguments specific to this claim limitation.

Claim 22 further recites “a command indicator comprising a command code,” which Petitioner sufficiently shows to be disclosed in Johnson by a preponderance of the evidence. *See* discussion of claim 1; Pet. 89; Ex. 1103 ¶¶ 355–57. Patent Owner does not make arguments specific to this claim limitation.

Claim 22 further recites “a data value comprising a scalable message,” which Petitioner sufficiently shows to be disclosed in Johnson by a preponderance of the evidence. *See* discussion of claim 7; Pet. 89; Ex. 1103 ¶¶ 358–60. Patent Owner does not make arguments specific to this claim limitation.

Claim 22 further recites “a function code corresponding to function status of a device co-located with the transceiver,” which Petitioner sufficiently shows to be disclosed in Johnson and Cunningham by a preponderance of the evidence. *See* discussion of claim 9; Ex. 1106, 5:58–67, 16:57–65, Fig. 2; Pet. 89–90; Ex. 1103 ¶¶ 361–66.

Petitioner refers to the discussion of claim 9 in the Petition to support the co-located” limitation of claim 22. We also refer to our discussion of claim 9. For the reasons discussed there regarding “associated with,” we

determine that Petitioner has sufficiently shown “co-located” which is met by a device physically connected to the transceiver as found regarding claim 9. Patent Owner’s argument at pages 62–63 of its Patent Owner Response do not acknowledge the Petition’s cross-reference to claim 9, so we are not convinced by those arguments. In the Sur-Reply, Patent Owner simply refers to the arguments regarding claim 9, so we are not convinced by those arguments for the reasons above.

Claim 23

Claim 23 depends from claim 22. For claim 23, Petitioner relies on its contentions from ground 1 except that it also relies on the contentions from this ground as to Cunningham. That is, claim 23 recites “wherein the device co-located with the transceiver is a sensor operatively coupled to the controller and wherein the controller is configured to format the data value with data sensed by the sensor,” which Petitioner sufficiently shows to be disclosed in Johnson and Cunningham by a preponderance of the evidence. *See* discussion of claims 9 and 22; Ex. 1106, 4:32–39, 57:1–3, Figs. 1, 46; Ex. 1111, 6:11–13, 6:26–29, 9:66–10:9, 36:40–47, 37:35–39, 42, 61–64, Figs. 1; Pet. 90–92; Ex. 1103 ¶¶ 646–53. Patent Owner does not make arguments specific to this claim.

Claim 24

Claim 24 depends from claim 22. Claim 24 recites “wherein the command code comprises at least one of a device-specific code or a non-device-specific code,” which Petitioner sufficiently shows to be disclosed in Johnson and Cunningham by a preponderance of the evidence. *See* discussion of claims 1, 9, and 10; Pet. 92–93; Ex. 1103 ¶¶ 654–59. Patent Owner does not make arguments specific to this claim limitation.

Claim 24 recites “the device-specific code commands change of a setting of an actuator co-located with the transceiver,” which Petitioner sufficiently shows to be disclosed in Johnson and Cunningham by a preponderance of the evidence. *See* discussion of claims 9 and 22; Pet. 93–94; Ex. 1103 ¶¶ 660–62. Patent Owner does not make arguments specific to this claim limitation.

Claim 24 recites “the non-device-specific code includes network status/diagnostic commands,” which Petitioner sufficiently shows to be disclosed in Johnson and Cunningham by a preponderance of the evidence. *See* Ex. 1106, 18:25–26, 57:45–49; Pet. 94; Ex. 1103 ¶¶ 663–65. Patent Owner does not make arguments specific to this claim limitation.

C. Obviousness of Claims over Johnson and Lyons

Petitioner contends that claims 10 and 24 are unpatentable under 35 U.S.C. § 103(a) as obvious over Johnson and Lyons. Pet. 5. To support its contentions, Petitioner provides explanations as to how the prior art allegedly teaches each claim limitation. *Id.* at 47–49, 92–94. On the entire trial record, Petitioner articulates sufficient reasons for combining Johnson and Lyons. *Id.* at 19. For example, Petitioner contends that:

A [person of ordinary skill in the art] would have been motivated to apply Lyons’s teachings of a “ping” in implementing Johnson. First, Johnson states that “modifications can be made” to its teachings. Johnson, 73:54-61. Second, “ping” commands, as taught by Lyons, were well-understood and commonly used. Madisetti, ¶108. Third, Lyons, like Johnson, is directed to collecting information from remote meters. Lyons, 1:11-16. Fourth, a [person of ordinary skill in the art] reviewing Johnson would have recognized the importance of maintaining a stable and reliable network to, *e.g.*, advantageously allow the system to be used for some control applications (*see* Johnson,

3:28-32, 26:16-23, 35:34-42), and would have been motivated to look to Lyons for, *e.g.*, its advantageous teachings on how to maintain integrity and reliability of networks by, *e.g.*, issuing “ping” and similar commands to verify the network is “functioning properly.” Lyons, 36:59-64; Madisetti, ¶108. A [person of ordinary skill in the art] further would have recognized this straightforward/predictable combination (yielding the claimed features) would have worked as expected. Madisetti, ¶108.

Id. at 19.

Claim 10

Claim 10 depends from claim 1. Claim 10 recites “the command code indicates a request for a ping response by the wireless communication device,” which Petitioner sufficiently shows to be disclosed in the combination of Johnson and Lyons by a preponderance of the evidence. *See* Ex. 1106, 18:25–29, 55:32–36, 57:45–49, 55:32–36, 58:25, Fig. 1; Ex. 1110, 36:65–37:3–21, 37:44–48; Pet. 57–58; Ex. 1103 ¶¶ 464–69.

Petitioner states that “[i]t would have been obvious to apply this teaching to advantageously implement a well-understood ‘ping’ as Johnson’s . . . command codes to, *e.g.*, improve network stability.” Pet. 19, 49. Petition also states Johnson invites modifications, Johnson and Lyons are directed toward communication with remote devices, and that it would be a predictable combination. *Id.* at 19. Patent Owner contends that Johnson’s status request function is redundant of Lyons ping request and, for that reason, one of ordinary skill would not be motivated to add Lyons functionality to Johnson. PO Resp. 43.

To support their position about the non-obviousness of adding Lyons ping response, Patent Owner cites *Kinetic Concepts, Inc. v. Smith & Nephew, Inc.*, 688 F.3d 1342, 1370–71 (Fed. Cir. 2012).

In *Kinetic*, the issue was whether to combine publications which “both . . . independently accomplish similar functions, namely, draining fluids.” *Kinetic Concepts, Inc.*, 688 F.3d at 1369. One set of publications involved negative pressure to drain wounds. *Id.* at 1362-1363. The other set of publications disclosed a different type of wound drainage system. *Id.* at 1365. The obviousness rejection was predicated on combining the two sets of publications to meet a limitation in the claim of using negative pressure to treat a wound. However, wound treatment was not described in the negative pressure publications. *Id.* at 1361, 1363. Because each publication was complete in teaching a wound drainage method, and there was *no teaching that negative pressure could be used to treat wounds*, the court found “a person having ordinary skill in the art, who was merely seeking to create a better device to drain fluids from a wound, would have no reason to combine the features of both devices into a single device.” *Id.* at 1369.

The facts presented in this Petition are distinguishable. The ping response is not being combined for some new previously unknown purpose but rather for its well-known purpose. Pet. 19.

Patent Owner also cites to *Winner Int’l Royalty Corp.*, 202 F.3d at 1349. *Winner* found no motivation to combine based on teaching away and “there was no apparent disadvantage to the dead-bolt mechanism of Johnson, and therefore the motivation to combine would not stem from the ‘nature of the problem’ facing one of ordinary skill in the art, because no ‘problem’ was perceived.” *Id.* However, the reason there was “no” motivation was that “district court . . . [found] that one of ordinary skill in the art would not have reasonably elected trading the benefit of security for that of convenience.” *Id.* *Winner* is also distinguishable. Here, there is no alleged

teaching away. Additionally, there is no suggestion using a ping response involves a trade off the one of ordinary skill would not make.

Also, if the ping response would further improve network stability, even if the Johnson status request function also improves network security, adding another function is a tradeoff one of ordinary skill is allowed to make in combining references. “[T]he benefits, both lost and gained, should be weighed against one another.” *Winner*, 202 F.3d at 1349 n.8. Additionally, “when a patent ‘simply arranges old elements with each performing the same function it had been known to perform’ and yields no more than one would expect from such an arrangement, the combination is obvious.” *KSR*, 550 F.3d at 417 (quoting *Sakraida v. Ag Pro, Inc.*, 425 U.S. 273, 282, 96 S.Ct. 1532 (1976)).

Thus, for the reasons above, we are not convinced by Patent Owner’s argument.

Claim 24

Claim 24 depends from claim 22 which Petitioner does not sufficiently show to be disclosed in Johnson by a preponderance of the evidence. The Petition does not rely on Lyons to make up for any deficiency as to the limitations of claim 22. Thus, Petitioner has not shown claim 24 to be disclosed in Johnson and Lyons by a preponderance of the evidence.

D. Obviousness of Claims over Johnson and Ardalan

Petitioner contends that claims 3, 4, 14, and 21 are unpatentable under 35 U.S.C. § 103(a) as obvious over Johnson and Ardalan. Pet. 5. To support its contentions, Petitioner provides explanations as to how the prior art allegedly teaches each claim limitation. *Id.* at 34–35, 59, 84–85. On the

present record, Petitioner articulates sufficient reasons for combining Johnson and Ardalan. *Id.* at 25–26. For example, Petitioner contends that:

It would have been obvious to apply Ardalan’s TCP/IP teachings in implementing Johnson’s addresses for wireless devices. First, Johnson states that “modifications can be made” to its teachings. Johnson, 73:54-61. Second, it was well-understood before 1998 that TCP/IP was commonly used to communicate between devices in a network, such as Johnson’s “wide area communications network,” as well as between different types of networks, such as Johnson’s RF network of NSMs, RCNs, and IDTs, and wide area networks used between Johnson’s IDTs and CDTs. . . . Johnson, Fig. 1, 23:45-24:11; Madisetti, ¶107. Third, a [person of ordinary skill in the art] would have recognized that using TCP/IP addressing would have advantageously allowed Johnson’s system to be more easily capable of communicating with a “variety of” different types of networked devices, permitting the networks to each use the same types of addresses. *E.g.*, Johnson, 25:59-67. A [person of ordinary skill in the art] further would have recognized this straightforward/predictable combination (yielding the claimed features) would have worked as expected. Madisetti, ¶107.

Id. at 17–18

Claim 3

Claim 3 depends from claim 2. Claim 3 recites “the unique transceiver address is an Internet Protocol address,” which Petitioner sufficiently shows to be disclosed in Johnson and Ardalan by a preponderance of the evidence. *See* Ex. 1108, 2:45–47, 2:55–59, 3:14–18, 3:32–58; Pet. 35; Ex. 1103 ¶¶ 426–29. Patent Owner does not make arguments specific to this claim.

Claim 4

Claim 4 depends from claim 1. Claim 4 recites “the function code further comprises an Internet Protocol address,” which Petitioner sufficiently

shows to be disclosed in Johnson and Ardalan by a preponderance of the evidence. *See* discussion of claim 3 above; Pet. 35–36; Ex. 1103 ¶¶ 433–34. Patent Owner does not make arguments specific to this claim.

Claim 14

Claim 14 depends indirectly from claim 11 which Petitioner does not sufficiently show to be disclosed in Johnson by a preponderance of the evidence. The Petition does not rely on Ardalan to make up for any deficiency as to the limitations of claim 11. Thus, Petitioner has not shown claim 14 to be disclosed in Johnson and Ardalan by a preponderance of the evidence.

Claim 21

Claim 21 depends from claim 16. For the reasons above, Petitioner has not shown by a preponderance of the evidence that claims 16 would have been obvious over Johnson. Ardalan does not overcome the deficiency in the showing regarding claim 16; therefore, Petitioner has not shown that claim 21 would have been obvious over Johnson and Ardalan.

E. Obviousness of Claims over Johnson and Ehlers

Petitioner contends that claims 11–13 and 15 are unpatentable under 35 U.S.C. § 103(a) as obvious over Johnson and Ehlers. Pet. 5. To support its contentions, Petitioner provides explanations as to how the prior art allegedly teaches each claim limitation. *Id.* at 47–59. On the present record, Petitioner articulates sufficient reasons for combining Johnson and Ehlers. *Id.* at 19–20. For example, Petitioner contends that:

A [person of ordinary skill in the art] would have been motivated to apply Ehlers’ teachings of how to track nodes in a LAN when implementing Johnson. First, Johnson states that

“modifications can be made” to its teachings. Johnson, 73:54-61. Second, both Johnson and Ehlers are directed to automatic meter reading systems. Johnson, 3:21-23; Ehlers, 1:7-12. Third, Johnson recognizes the need for “path redundancy” by making sure an appropriate number of NSMs and RCNs are deployed without over-deploying nodes such that there are “collisions” in communications. Johnson, 24:22-57, 27:30-54; 28:32-36. A [person of ordinary skill in the art] would have recognized that allowing Johnson’s RCNs to track locations of individual devices would advantageously simplify the ability for the system to know where devices were located, allowing for easier troubleshooting and improvement of the system’s stability. Madisetti, ¶109. Third, Johnson’s RCNs and NSMs are organized similarly to Ehlers’s customer premises external unit (CPEU) 12 containing its first micro-computer and the devices that communicate with that CPEU, respectively . . . Johnson, Fig. 1; Ehlers, Fig. 1; Madisetti, ¶109. A [person of ordinary skill in the art] further would have recognized this straightforward/predictable combination (yielding the claimed features) would have worked as expected. Madisetti, ¶109.

Id. at 19–20.

Claim 11

Independent Claim 11 recites “[a] method of communicating command and sensed data between remote wireless devices,” which Petitioner contends is shown to be disclosed in Johnson. *See* Pet. 49; Ex. 1103 ¶¶ 470–72.

As explained above, we determined that the preamble is not limiting but we rely on Petitioner’s contentions cited above as a predicate of the contentions below, so they are listed here. Patent Owner’s arguments regarding the preamble are not commensurate with the scope of the invention as properly construed. *See* PO Resp. 51.

Claim 11 further recites “providing a receiver to receive at least one message; wherein the message has a packet that comprises a receiver address, a command indicator comprising a command code, a variable data value comprising a message, and a redundancy check error detector,” which Petitioner has shown by a preponderance of the evidence to be disclosed in Johnson. *See* Ex. 1106, 11:36–39, 35:65–36:16; Pet. 49–53; Ex. 1103 ¶¶ 487–88. Patent Owner does not make arguments specific to this claim limitation.

Claim 11 further recites “a controller to determine if at least one received message is a duplicate message,” which Petitioner sufficiently shows to be disclosed in Johnson by a preponderance of the evidence. *See* Ex. 1106, 18:46–49, 19:15–20, 26:29–53, 27:31–54, 49:37–45; Pet. 53–54; Ex. 1103 ¶¶ 473–92. Patent Owner does not make arguments specific to this claim limitation.

Patent Owner argues Petitioner’s challenge to claim 11 is deficient because of the same argument above with regard to tying specific functions to Johnson’s controller (PO Resp. 49–51); thus, for the same reasons discussed above including that Patent Owner request more detail than is required given the technology at issue, we are not convinced by that argument. For example, Petitioner explains that “[t]he RCN processor . . . identifies duplicates of NSM packet signals.” Pet. 53–54 (citing Ex. 1106, 18:46–49).

Claim 11 further recites “determining a location from which the duplicate message originated,” which Petitioner has shown to be disclosed in Johnson and Ehlers by a preponderance of the evidence. *See* Ex. 1111,

10:8–40, 10:52–62, 12:17–50, Figs. 1, 11–14; Pet. 54–57; Ex. 1103 ¶¶ 493–96. Patent Owner does not make arguments specific to this claim limitation.

Petitioner contends “Ehlers discloses determining a location (e.g., using “char location” in “DEVICES”) from which the *duplicate message* (e.g., reading response) originated.” Pet. 54 (emphasis added). Ehlers does not identify duplicates and Petitioner does not cite to disclosure in Ehlers indicating that a reading response is a duplicate message; Johnson performs that function. Petitioner states “Johnson teaches RCNs determine when they receive duplicate copies of an NSM-packet signal from an NSM identified by the NSM-packet signal’s *address field*.” Pet. 55–56 (citing 1106, 20:13–21, 41:44–52, 52:51–62). With that predicate, Petitioner contends Johnson’s RCN receives a duplicate message, the RCN identifies the source of the message—including its location—because [in this combination] the RCN uses the DEVICE entry that includes the device’s location to identify the sending device.” *Id.* at 55. Petitioner further contends it would have been obvious to “apply Ehlers’ teaching of using a data structure to track the location of every device in the network, such that the device (e.g., Johnson’s RCN) receiving the duplicate message can advantageously determine the message’s origin in order to, e.g., locate and resolve faults in the system.” *Id.* at 63.

Patent Owner argues that “Petitioner provides no explanation for how one of ordinary skill would have incorporated *Ehlers*’s data structure. (Ex. 2004 ¶ 62.) While Petitioner contends that *Johnson*’s RCNs and NSMs are generally organized similarly to *Ehlers*’s customer premises external unit (Petition at 20), Petitioner never explains whether *Ehlers*’s data structure is complementary to *Johnson*’s data structure, whether it would replace aspects

of *Johnson*'s data structure, or whether some other modification would be needed to accommodate both." PO Resp. 44–45. Patent Owner asserts this argument is not requiring Petitioner to bodily incorporate the references, but rather Petitioner still must explain "how specific references could be combined, which combination(s) of elements in specific references would yield a predictable result, or how any specific combination would operate." Sur-Reply 19 (citing *ActiveVideo Networks, Inc. v. Verizon Commc'ns, Inc.*, 694 F.3d 1312, 1327 (Fed. Cir. 2012)). We are not convinced by this argument.

"The 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); *In re Mouttet*, 686 F.3d 1322, 1332 (Fed. Cir. 2012) (citing *In re Keller*, 642 F.2d at 425), but rather whether "a skilled artisan would have been motivated to combine the teachings of the prior art references to achieve the claimed invention," *Pfizer, Inc. v. Apotex, Inc.*, 480 F.3d 1348, 1361 (Fed. Cir. 2007). "Combining the teachings of references does not involve an ability to combine their specific structures." *In re Nievelt*, 482 F.2d 965, 968 (CCPA 1973).

Petitioner further argues:

applying the teaching of a 'location' field in a data structure that is stored at a first microcomputer, and which is used to track individual devices in implementing *Johnson*'s RCN, is compatible with *Johnson*'s teachings, and further would have been obvious because the systems are similarly-structured and these devices serve similar purposes.

Reply 19–20. Petitioner’s declarant reaffirms that the field to identify the location of a device is compatible with the data structure of Johnson. Ex. 1176 ¶ 42. Thus, we are not convinced by Patent Owner’s argument.

Patent Owner also argues that because Johnson’s meters are in fixed physical locations there is no need to determine their locations. PO Resp. 45–46. Patent Owner contrasts this with the specification of the ’708 patent that describes mobile devices; finding the location of device which can move around requires triangulation. *Id.* Patent Owner has not shown sufficiently that the claims require mobile devices as opposed to stationary ones, nor has Patent Owner shown that a limitation to mobile devices should be imported into the claims.

To the contrary, Petitioner explains that

The ’268 patent to which the ’708 claims priority and which is incorporated by reference into the ’708 (’708 at 1:25–38) states that providing an identification code of a fixed-location transceiver will “inform the central station . . . of the particular vending machine . . . and thus its location.”

Reply 18. Thus, the record suggests that location in the claims is broad enough to apply to stationary devices. Thus, we are not convinced by Patent Owner’s argument.

Next, Patent Owner argues that Petitioner has not provided sufficient motivation to combine Johnson and Ehlers because “if a wireless transceiver is faulty, it is far more likely to transmit no messages at all as opposed to issuing a message that duplicates a message it previously sent or that was also sent from another meter.” PO Resp. 47 (citing Ex. 2004 ¶ 65). In response, Petitioner points to the other motivations discussed in the Petition, specifically, that “knowing the physical locations of devices can help

minimize ‘simultaneous message transmissions, or collisions’ that undermine the network’s reliability.” Reply 19 (citing Ex. 1106, 24:22–57, 27:30–54; 28:32–36, 52:33–37; Ex. 1003 ¶ 496); Pet. 20. Thus, Petitioners motivation ties knowledge of location to collisions which is separate from Patent Owner’s focus on whether the sender of a duplicate message is faulty. This motivation combined with the fact that the RCN identifies duplicate messages provides further motivation to combine the references that would result in the limitation in the claim. Based on the discussion above, we determine that Petitioner has provided a reasonable rationale for combining Johnson and Ehlers.

Patent Owner argues, for the first time in the Sur-Reply, that Johnson discloses methods of solving the collision problem and that Johnson discloses the collision problem is “minimal” and is “resolved” by several techniques. Sur-Reply 18.¹⁴ This argument was also not discussed in the

¹⁴ Patent Owner discusses “collisions” only once in its Patent Owner Response. PO Resp. 48–49. The discussion relates to Patent Owner’s argument the Petition has not shown that “identifying the location of the polling IDT and RCN would allow the receiving RCN to determine whether it is closer to the polling IDT or RCN.” *Id.* at 48. In support of that argument Petitioner stated knowing the location of device would “reduc[e] the impact on the system from simultaneous messages transmissions or collisions.” Pet. 57. In response to that argument Patent Owner states:

declaration of Dr. Ghobad Heidari. *See* Ex. 2004. At the time of filing its Patent Owner Response, Patent Owner knew Petitioner was relying on collisions as a motivation because it was discussed in the Petition. *See* Pet. 20, 55–57. Thus, Patent Owner cannot raise a new argument regarding collisions for the first time in a Sur-Reply. Arguments not presented in the Patent Owner Response “will be deemed waived.” Update to the Trial Practice Guide (83 Fed. Reg. 38,989 (Aug. 13, 2018)) (notifying the public of the updated “Trial Practice Guide” and its accessibility through the USPTO website: <https://go.usa.gov/xU7GP>) (“Practice Guide Update”) at 15 (A “sur-reply that raises a new issue or belatedly presents evidence may not be considered”; a sur-reply may “respond” to arguments “raised” in the reply but “respond . . . does not mean embark in a new direction with a new

[T]his argument is also problematic because Petitioner fails to demonstrate a correlation between the need to “minimize bandwidth consumption” and determining a location of a polling RCN or IDT. (Ex. 2004 ¶¶ 67-68.) Many factors can affect bandwidth consumption, and Petitioner fails to demonstrate that responding to a closer polling device in terms of physical location necessarily results in minimizing bandwidth consumption. (Ex. 2004 ¶ 68.) In the co-pending IPR2019-00545, Petitioner made similar arguments, and the Board preliminarily found that “this appears to be hindsight attorney argument that is not sufficiently supported [by the asserted reference].” *Emerson Elec. Co. v. SIPCO LLC*, IPR2019-00545, Paper 16 at 30 (P.T.A.B. Aug. 30, 2019). The Board should reach the same conclusion here.

Id. at 48–49. Thus, in its Patent Owner Response’s discussion of collisions, Patent Owner did not cite to Johnson nor state that Johnson discloses that the impact of collisions is “minimal” or “resolved.”

approach as compared to positions taken in a prior filing.”). We decline to consider this argument.

Although we determine this argument is new and we don’t rely on it, if we were to rely on it, it would not change this Decision as we discuss below. We note that Johnson states that the problem is “resolved” but then subsequently states that the problem is minimal and states the “the probability of receiving a packet any time during the day is maintained at exceptionally high levels.”

Thus, Johnson does not state that there is no problem with collisions rather that the problem is “resolved” to the extent that there is a high probability of receiving a packet. Ex. 1106, 52–57. Additionally, Patent Owner has not addressed whether there remains a benefit to adding a redundant feature for additional protection against collisions. Even if Johnson states the problem is solved, it is unnecessary for Petitioner to show that collisions were a known problem in Johnson’s particular system to support the argument that an ordinarily skilled artisan would have been motivated to seek to apply Ehler’s teachings regarding locating physical devices in a wireless system. *See Unwired Planet, LLC v. Google Inc.*, 841 F.3d 995, 1002–04 (Fed. Cir. 2016) (“Google also argues that it does not need to show that there was a known problem with the prior art system in order to articulate the required rational underpinning for the proposed combination. We agree.”).

For the reasons above, even if we accepted Patent Owner’s evidence of the limited benefit, we would decrease the weight of Petitioner’s evidence of a rationale to combine the teachings only slightly. Overall, we would find that Petitioner has shown an adequate rationale to modify Johnson with the

teachings of Ehlers. Nevertheless, because this argument was raised for the first time in the Sur-Reply, we are not convinced by Patent Owner's argument.

Patent Owner argues Petitioner's contentions regarding claims 12, 13, and 15 should be rejected for the same reasons discussed above. PO Resp. 52. We are not convinced by this argument for the reasons discussed above.

Claim 12

Claim 12 depends from claim 11. Claim 12 recites "providing one or more remote wireless communication devices," which Petitioner sufficiently shows to be disclosed in Johnson and Ehlers by a preponderance of the evidence. *See* discussion of remote devices associated with claim 1; Pet. 57; Ex. 1103 ¶¶ 497–99. Patent Owner does not make arguments specific to this claim limitation.

Claim 12 further recites "geographically remote transceivers adapted to transmit and receive the at least one message," which Petitioner sufficiently shows to be disclosed in Johnson by a preponderance of the evidence. *See* discussion of remote devices associated with claim 1; Ex. 1106, 10:24–61, Figs. 1–2; Pet. 64; Ex. 1103 ¶¶ 500–02. Patent Owner does not make arguments specific to this claim limitation.

Claim 12 further recites "transmission is accomplished by radio frequency or internet protocol," which Petitioner sufficiently shows to be disclosed in Johnson by a preponderance of the evidence. *See* discussion of RF associated with claim 1; Pet. 58; Ex. 1103 ¶¶ 503–05. Patent Owner does not make arguments specific to this claim limitation.

Claim 13

Claim 13 depends from claim 11. Claim 13 recites “providing at least one remote wireless communication device,” which Petitioner sufficiently shows to be disclosed in Johnson and Ehlers by a preponderance of the evidence. *See* discussion of remote devices associated with claim 1; Pet. 58; Ex. 1103 ¶¶ 506–08. Patent Owner does not make arguments specific to this claim limitation.

Claim 13 further recites “at least one of the devices has a unique address and the packet further comprises at least one address field to contain the unique address for at least one device,” which Petitioner sufficiently shows to be disclosed in Johnson and Ehlers by a preponderance of the evidence. *See* discussion of unique address associated with claims 2 and 11; Pet. 58–59; Ex. 1103 ¶¶ 509–11. Patent Owner does not make arguments specific to this claim limitation.

Claim 15

Claim 15 depends from claim 11. Claim 15 recites “determining if an error exists in a packet of the at least one message,” which Petitioner sufficiently shows to be disclosed in Johnson by a preponderance of the evidence. *See* Ex. 1106, 35:65–36:2, 40:1–15, 40:31–38; Pet. 59; Ex. 1103 ¶¶ 515–17. Patent Owner does not make arguments specific to this claim.

F. Obviousness of Claims over Johnson and Lee

Petitioner contends that claims 5 and 19 are unpatentable under 35 U.S.C. § 103(a) as obvious over Johnson and Lee. Pet. 6. On the present record, Petitioner articulates sufficient reasons for combining Johnson and Lee. *Id.* at 36–40, 75–78. For example, Petitioner contends that:

It would have been obvious to apply Lee's teachings to specify multiple commands in a packet—*e.g.*, concatenating multiple “msgtype” or “signaling data” codes to, *e.g.*, poll multiple types of data and also issue other commands. First, Johnson states that “modifications can be made” to its teachings. Johnson, 73:54-61. Second, Johnson and Lee are directed to similar purposes of collecting meter information; Lee discloses that its teachings can be applied “in many other contexts such as a direct radio communication[] between a meter and a central radio interrogation unit.” Lee, 1:11-15, 7:31-36. Third, Johnson teaches it is advantageous to efficiently use bandwidth, and recognizes multiple benefits to such efficient use that would have been realized by sending multiple commands in a single packet or allowing services to “share[]” bandwidth with other services. Johnson, 27:30-28:31. A [person of ordinary skill in the art] further would have recognized this straightforward/predictable combination (yielding the claimed features) would have worked as expected. Madisetti, ¶110. . . .

Further, a [person of ordinary skill in the art] would have been motivated to combine Johnson's teachings with one or more of the above references as set forth in §IV for the same reasons explained above in §§VI.E.1-VI.E.4. Madisetti, 111, 91–104

Id. at 20–21

Claim 5

Claim 5 depends from claim 1. Claim 5 recites “the command code of the preformatted message are concatenated to provide a receiving device with multiple command codes, the device configured to perform one or more functions corresponding to the command code in the preformatted message,” which Petitioner sufficiently shows to be disclosed in Johnson and Lee by a preponderance of the evidence. Ex. 1009, 4:50–57, Fig. 7A; Pet. 39; Ex. 1103 ¶¶ 441–442. Patent Owner does not make arguments specific to this claim.

Claim 19

Claim 19 depends from claim 16 which Petitioner does not sufficiently shows to be disclosed in Johnson by a preponderance of the evidence. The Petition does not rely on Lee to make up for any deficiency as to the limitations of claim 16. Thus, Petitioner has not shown claim 19 to be disclosed in Johnson and Lee by a preponderance of the evidence. Patent Owner does not make arguments specific to this claim.

G. Obviousness of Claims over Johnson in view of Cunningham or Ardalan and in further view of Lyons, Ehlers, or Lee

Petitioner contends that claims 14, 19, and 24 are unpatentable under 35 U.S.C. § 103(a) as obvious over Johnson in view of Cunningham or Ardalan and in further view of Lyons, Ehlers, or Lee. Pet. 6. To support its contentions, Petitioner provides explanations as to how the prior art allegedly teaches each claim limitation. *Id.* at 58–66.

This ground combines contentions from the previous grounds including the ground with Johnson alone, and the grounds that add Cunningham, Ardalan, Lyons, Ehlers, and Lee.

This ground is the only ground that challenges claim 14 based on Johnson and Ehlers, thus we discuss that combination below. Claim 14 depends from claim 13. Claim 13 depends from independent claim 11. As explained above, both claims 11 and 13 have been shown to have been obvious over the combination of Johnson and Ehlers. Claim 14 recites “the unique address of at least one remote wireless communication device is an Internet Protocol address,” which Petitioner sufficiently shows to be disclosed in Johnson and Ehlers (and thus, Johnson, Cunningham, Ardalan,

Lyons, Ehlers, and Lee) by a preponderance of the evidence. *See* discussion of IP address associated with claim 3; Pet. 59; Ex. 1103 ¶¶ 512–14.

This ground challenges claim 19 based on Johnson and Cunningham among other references. As discussed above, we determine that Petitioner shows sufficiently claim 19 is disclosed in the combination of Johnson and Cunningham, thus it is also disclosed in Johnson, Cunningham, Ardalan, Lyons, Ehlers, and Lee by a preponderance of the evidence. *See* discussion of claim 5 and 16; Pet. 75–78; Ex. 1103 ¶¶ 380–84, 585–87.

This ground challenges claim 24 based on Johnson and Cunningham among other references. As discussed above, we determine that Petitioner shows sufficiently claim 24 is disclosed in the combination of Johnson and Cunningham, thus it is also disclosed in Johnson, Cunningham, Ardalan, Lyons, Ehlers, and Lee by a preponderance of the evidence.

IV. CONCLUSION

For the foregoing reasons, we determine Petitioner has demonstrated, by a preponderance of the evidence, the unpatentability of claims 1–24 of the '708 patent.¹⁵

¹⁵ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner's attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. *See* 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. *See* 37 C.F.R. § 42.8(a)(3), (b)(2).

V. ORDER

Accordingly, it is

ORDERED that claims 1–24 of U.S. Patent No. 8,964,708 B2 are unpatentable;

FURTHER ORDERED that claims 1–24 of U.S. Patent No. 8,964,708 B2 are not shown to be unpatentable; and

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

In summary:

Claim(s)	35 U.S.C. §	Reference(s)/ Basis	Claim(s) Shown Unpatentable	Claim(s) Not Shown Unpatentable
1–2, 5–8, 10–13, 15–20, 22, 24	103(a)	Johnson	1–2, 5–8	10–13, 15, 16–20, 22, 24
3–4, 9, 14, 16–24	103(a)	Johnson and Cunningham	3–4, 9, 16–24	14
10, 24	103(a)	Johnson and Lyons	10	24
3–4, 14, 21	103(a)	Johnson and Ardalan	3, 4	14, 21
11–13, 15	103(a)	Johnson and Ehlers	11–13, 15	
5, 19	103(a)	Johnson and Lee	5	19
14, 19, 24	103(a)	Johnson, Cunningham, Ardalan, Lyons, Ehlers, or Lee	14, 19, 24	
Overall Outcome			1–24	

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