UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

EMERSON ELECTRIC CO.,
Petitioner

v.

SIPCO, LLC.,
Patent Owner

Case IPR2016-00984

Patent 8,754,780

PATENT OWNER'S NOTICE OF APPEAL
35 U.S.C. § 142 & 37 C.F.R. § 90.2

Pursuant to 37 C.F.R. § 90.2(a), Patent Owner, SIPCO, LLC, hereby provides notice of its appeal to the United States Court of Appeals for the Federal Circuit for review of the Final Written Decision of the United States Patent and Trademark Office ("USPTO") Patent Trial and Appeals Board ("PTAB") in Inter Partes Review 2016-00984, concerning U.S. Patent 8,754,780 ("the '780 patent"), entered on October 25, 2017, attached hereto as Appendix A.

ISSUES TO BE ADDRESSED ON APPEAL

A. Whether the PTAB erred in preventing Patent Owner from petitioning the Petitions Branch of the U.S. PTO to accept an unintentionally delayed priority claim?

B. Whether the PTAB properly construed the following claim limitations: "function" and "function code"?

C. Whether the PTAB erred in concluding that claims 1-15 would have been obvious under 35 U.S.C. § 103 over U.S. Patent 8,013,732?

D. Whether the PTAB erred in concluding that claims 1, 2, and 7 would have been obvious over Kahn in view of the APA?

E. Whether the PTAB erred in concluding that claims 4, 6, and 8 would have been obvious over Kahn in view of the APA and Burchfiel would have been obvious under 35 U.S.C. § 103?

Simultaneous with submission of this Notice of Appeal to the Director of the United States Patent and Trademark Office, this Notice of Appeal is being filed with the Patent Trial and Appeal Board. In addition, this Notice of Appeal, along with the required docketing fees, is being filed with the United States Court of Appeals for the Federal Circuit.

Respectfully submitted,

Dated: December 21, 2017

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CERTIFICATE OF SERVICE

The undersigned certifies that in addition to being filed electronically through the Patent Trial and Appeal Board's E2E system the foregoing PATENT OWNER'S NOTICE OF APPEAL was served on the Director of the United States Patent and Trademark Office, at the following address (in accordance with 37 C.F.R. §§ 90.2(a), 104.2):

Director of the United States Patent and Trademark Office

c/o Office of the General Counsel

United States Patent and Trademark Office

P.O. Box 1450 Alexandria, Virginia 22313-1450

CERTIFICATE OF FILING

The undersigned certifies that on December 21, 2017, a true and correct copy of the foregoing PATENT OWNER'S NOTICE OF APPEAL was filed electronically with the Clerk's Office of the United States Court of Appeals for the Federal Circuit at the following address:

Clerk of Court

United States Court of Appeals for the Federal Circuit

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Washington, DC 20005

CERTIFICATE OF SERVICE

The undersigned hereby certifies that a copy of the foregoing PATENT OWNER'S NOTICE OF APPEAL was served on December 21, 2017, by filing this document though the PTAB's E2E system as well as by delivering a copy via electronic mail to the attorneys of record for the Petitioners as follows:

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Appendix A

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Paper No. 43
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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

EMERSON ELECTRIC CO.,
Petitioner,

v.

SIPCO, LLC,
Patent Owner.

Case IPR2016-00984
Patent 8,754,780 B2

Before LYNNE E. PETTIGREW, STACEY G. WHITE, and CHRISTA P. ZADO, *Administrative Patent Judges*.

ZADO, *Administrative Patent Judge*.

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

I. INTRODUCTION

We have authority to hear this *inter partes* review under 35 U.S.C. § 6. This Final Written Decision ("Decision") is issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons discussed herein, we determine that Emerson Electric Co. ("Petitioner")[1] has shown, by a preponderance of the evidence, that claims 1–15 of U.S. Patent No. 8,754,780 B2 (Ex. 1001, the "'780 patent") are unpatentable. *See* 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d).

A. Procedural History

Petitioner filed a Petition for *inter partes* review of claims 1–15 of the '780 patent (Paper 1, "Pet.") and SIPCO, LLC ("Patent Owner") subsequently filed a Preliminary Response (Paper 12, "Prelim. Resp."). On November 2, 2016, we instituted an *inter partes* review to determine whether claims 1–15 of the '780 patent are unpatentable under 35 U.S.C. § 103(a) over the '732 patent[2], whether claims 1, 2, and 7 of the '780 patent are unpatentable under 35 U.S.C. § 103(a) over Kahn[3] in view of admitted prior art (the "APA")[4], and whether claims 4–6 and 8 of the '780 patent are

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[1] Petitioner identifies as real parties in interest, pursuant to 37 C.F.R. § 42.8, Emerson Electric Co., Emerson Process Management LLP, Fisher-Rosemount Systems, Inc., and Rosemount, Inc. Paper 17.

[2] U.S. Patent No. 8,013,732 B2 (Ex. 1012) ("the '732 patent").

[3] Robert E. Kahn et al., *Advances in Packet Radio Network Protocols*, Proceedings of the IEEE, Vol. 66, No. 11, Nov. 1978 (Ex. 1015) ("Kahn").

[4] Petitioner refers to portions of the '780 patent as Admitted Prior Art ("APA"). *See, e.g.*, Pet. 16–17; *see also* Ex. 1001.

unpatentable under 35 U.S.C. § 103(a) over Kahn in view of the APA and Burchfiel.[5] Paper 18, 26 ("Inst. Dec.").

After institution, Patent Owner filed a Response (Paper 22, "PO Resp." or "Response"), and Petitioner filed a Reply (Paper 25, "Reply"). An oral hearing was held on July 13, 2017. A transcript of the hearing is included in the record. Paper 40 ("Tr.").

Also, Patent Owner filed Patent Owner SIPCO LLC's Observations on Cross-Examination of Dr. Heppe (Paper 33, "Obs."), and Petitioner filed a Response thereto (Paper 35, "Resp. to Obs.").

B. Related Proceedings

The parties indicate that Patent Owner has asserted the '780 patent against Petitioner in *SIPCO, LLC v. Emerson Electric Co.*, 6:15-cv-00907 (E.D. Tex.). Pet. 1; Paper 7, 1–2. Petitioner further indicates that Patent Owner has asserted a patent related to the '780 patent, U.S. Patent No. 7,103,511, against it in *Emerson Electric Co. v. SIPCO, LLC*, 1:15-cv-0319 (N.D. Ga.). Pet. 1.

Several *inter partes* review petitions have been filed with respect to patents related to the '780 patent. The parties inform us, for example, that Petitioner has filed petitions requesting *inter partes* review with respect to two related patents, U.S. Patent No. 8,013,732 (IPR2015-01973) and U.S. Patent No. 6,914,893 (IPR2015-01579). Pet. 2; Paper 7, 1–2. The parties failed to inform us of additional *inter partes* review petitions for patents related to the '780 patent (*see, e.g.*, IPR2017-00216 and IPR2017-00252)

[5] J. Burchfiel et al., *Functions and Structure of a Packet Radio Station*, National Computer Conference presented paper, 1975 (Ex. 1016) ("Burchfiel").

that were filed after June 8, 2016, the last date either party filed mandatory notices pursuant to 37 C.F.R. § 42.8(b)(2) regarding related matters.[6]

Also, Patent Owner filed several Requests for a Certificate of Correction and Petitions to Accept an Unintentionally Delayed Priority Claim and for Expedited Consideration with respect to the ’780 patent (*see*, *e.g.*, Exs. 1022, 1023, 2034) and patents related to the ’780 patent.

Petitioner also identifies a number of pending U.S. Patent Applications related to the ’780 patent. Pet. 1–2.

C. The ’780 Patent

The ’780 patent, titled “Systems and Methods for Monitoring and Controlling Remote Devices,” relates to “a system for monitoring a variety of environmental and/or other conditions within a defined remotely located region,” wherein the system includes a plurality of wireless transmitters with integrated sensors adapted to monitor data input. Ex. 1001, Abstract.

[6] Parties have an on-going duty to file with the Board an identification of related matters within 21 days. 37 C.F.R. §§ 42.8(a)(3) and 42.8(b)(2). Neither party has explained why it failed to comply with its obligation to file in this proceeding updated notices identifying related matters. Indeed, both parties are aware of their on-going obligation under 37 C.F.R. § 42.8 to amend or supplement their mandatory notices, and filed updated mandatory notices with regard to counsel designation (Papers 36, 42) and real party in interest (Paper 17).

Figure 2 of the ’780 patent is reproduced below:

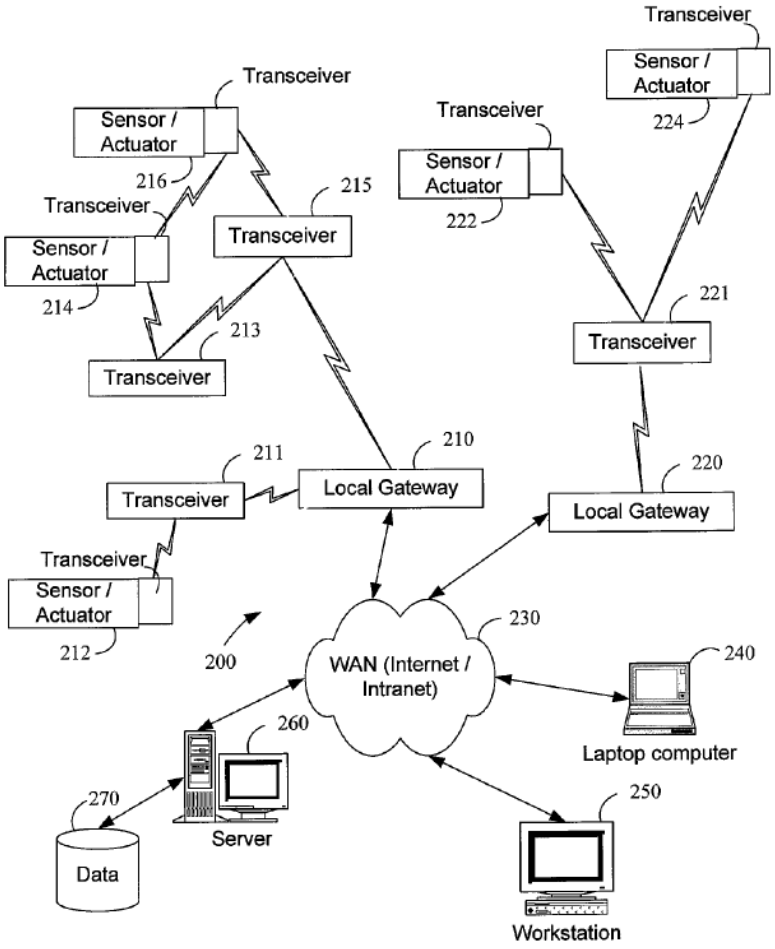

FIG. 2

Ex. 1001, Fig. 2. Figure 2 depicts a block diagram illustrating a monitoring/control system. *Id.* at 4:50–51. More specifically, Figure 2 depicts transceivers 212, 214, 216, 222, and 224 for transmitting data signals and receiving controls signals, wherein the transceivers have integrated sensors/actuators. *Id.* at 7:42–51. The ’780 patent specification discloses that radio frequency (RF) transmitter blocks 340 within the integrated transceivers each have “a unique identification code (e.g., transmitter identification number) 326, that uniquely identifies the transmitter to the

functional blocks of control system 200." *Id.* at 8:53–56; *see also id.* at 9:49–51 (explaining that many components of RF transmitter 340, depicted in Figure 3B, are similar to the corresponding components depicted in Figure 3A); *see also id.* at Figs. 3A and 3B. In one embodiment, RF transmitter block 320 is interfaced with sensor 310 via data interface 321, and accepts information from sensor 310 in digital electronic form. *Id.* at 8:66–67, Fig. 3A. The '780 patent specification further discloses data controller 324 that formats data packets 330 for RF transmission, wherein each data packet 330 includes RF transmitter 328's unique identification code (*see* Fig. 3B, "X-mitter I.D. 326") and a function code. *Id.* at 9:56–60. In one embodiment, the '780 patent describes lookup table 325 in which each unique function code corresponds to a button that is pressed on transmitter unit 320 that is worn by a person, and includes buttons the user may actuate by depressing the button. *Id.* at 8:26–31, Fig. 3A. The '780 patent specification further discloses that

> [f]unction codes, transmitter and or transceiver identification numbers, may all be stored with associated information within lookup tables 425. Thus, one look up table may be provided to associate transceiver identification numbers with a particular user. Another look up table may be used to associate function codes with the interpretation thereof. For example, a unique code may be associated by a look up table to identify functions such as test, temperature, smoke alarm active, security system breach, etc.

Id. at 11:51–60.

D. Challenged Claims

Of the challenged claims noted above, claims 1 and 9 are independent, and claims 2–8 and 10–15 depend therefrom.

Claim 1, reproduced below, is illustrative:

> 1. In a system comprising a plurality of wireless devices, a device comprising:
>
> a transceiver having a unique identification code and being electrically interfaced with a sensor, the transceiver being configured to receive select information and identification information transmitted from a second wireless transceiver in a predetermined signal type;
>
> the transceiver being further configured to wirelessly retransmit in the predetermined signal type the select information, the identification information associated with the second wireless transceiver, and transceiver identification information associated with the transceiver making retransmission; and
>
> a controller operatively coupled to the transceiver and the sensor, the controller configured to control the transceiver and receive data from the sensor, the controller configured to format a data packet for transmission via the transceiver, the data packet comprising data representative of data sensed with the sensor.

Ex. 1001, 18:53–19:4.

II. DISCUSSION

A. Level of Ordinary Skill in the Art

Petitioner contends that a person of ordinary skill in the art in the field of the ’780 patent has:

> through formal education or extensive practical experience, the equivalent of a Bachelor’s Degree in Electrical Engineering and 2–3 years of experience in designing and developing radio communications and/or computer networks systems or marketing such systems from a technical standpoint.

Pet. 10; *see also* Ex. 1018 ¶ 8 (opinion of Petitioner’s expert, Dr. Heppe, regarding the level of ordinary skill in the art).

Patent Owner does not propose a relevant level of ordinary skill in the art in Patent Owner’s response. Patent Owner’s expert, Dr. Kevin

C. Almeroth, however, opines that a person of ordinary skill in the art with respect to the ’780 patent:

> would have the equivalent of a four-year degree from an accredited institution (usually denoted as a B.S. degree) in computer science, computer engineering, or the equivalent and at least two years of experience with, or exposure to the design and development of wireless communication network systems, including familiarity with protocols used therein. Additional graduate education could substitute for professional experience, while significant experience in the field might substitute for formal education.

Ex. 2001 ¶ 75.

We do not discern any material differences between the two proffered levels of ordinary skill in the art that would affect our Decision. Neither expert disagrees with the other expert’s opinion as to the level of ordinary skill in the art in the field of the ’780 patent. Accordingly, for purposes of this Decision, we determine that a person of ordinary skill in the art with respect to the ’780 patent would have had the equivalent of a four-year degree from an accredited institution (including a B.S. degree) in electrical engineering, computer science, computer engineering, or the equivalent, and would have had at least two years of experience designing and developing radio communications and/or computer network systems or wireless communication network systems.

B. Claim Construction

In an *inter partes* review, claim terms in an unexpired patent are interpreted according to their “broadest reasonable construction in light of the specification of the patent” in which they appear. 37 C.F.R. § 42.100(b); *see also Cuozzo Speed Techs., LLC, v. Lee*, 136 S. Ct. 2131, 2141–46

(2016). The terms also generally are given their ordinary and customary meaning as would be understood by one of ordinary skill in the art in the context of the disclosure. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007).

Petitioner contends that with respect to its challenges based on the ’732 patent, which shares a similar specification and claims with the ’780 patent, no claim construction is necessary because the ’732 disclosure is similar in scope to the claim terms of the ’780 patent. Pet. 11. Patent Owner does not dispute this. Based on the current record, we are persuaded that the challenges based on the ’732 patent do not raise any controversies that require claim interpretation. *See Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (holding that claim terms need only be interpreted to the extent necessary to resolve the controversy).

With respect to its challenges based on Kahn in view of the APA and Burchfiel, Petitioner does not propose any express claim constructions. Pet. 11–12. Petitioner, however, attempts to reserve its right to argue the same constructions for the terms “sensor,” “actuator,” and “function code,” as it did in its Petition for IPR2015-01973, which challenged the patentability of claims of the ’732 patent. *Id.* at 12. Patent Owner proposes constructions for the terms “sensor,” “function,” and “function code.” Response 16–27. Below we discuss our interpretation of the terms “sensor,” “function,” and “function code.”

For purposes of this Decision, we determine no other claim terms require express construction. *See Wellman, Inc. v. Eastman Chem. Co.*, 642 F.3d 1355, 1361 (Fed. Cir. 2011) (“[C]laim terms need only be construed ‘to

the extent necessary to resolve the controversy.'") (quoting *Vivid Techs.*, 200 F.3d at 803).

1. *"sensor"*

The issue raised by the parties' proposed constructions is whether the term "sensor" should be construed to encompass a software program. Petitioner proposes that we interpret the term "sensor" to mean "an equipment, *program* or device that monitors or measures the state or status of a parameter or condition and provides information concerning the parameters or condition." Reply 1 (emphasis added). Patent Owner proposes that we interpret the term "sensor" to mean a "device that monitors or measures the state or status of a condition and provides information concerning the condition." PO Resp. 17 (emphasis omitted). Patent Owner does not dispute that a sensor measures a parameter, as well as a condition. *Id.* at 16–17. Indeed, the '780 patent specification indicates that the sensors of the invention monitor parameters. Ex. 1001, 10:1–7. Patent Owner argues only that the words "equipment" and "program" should be omitted from Petitioner's proposed construction. PO Resp. at 17. Petitioner concedes that the word "equipment" is not materially different from the word "device," and does not oppose omitting it from construction of the term "sensor." Response 2. Accordingly, the parties dispute only whether the word "program" should be omitted from our interpretation of the term "sensor." However, because Petitioner's contentions do not allege any software satisfies the claimed "sensor" limitation, we need not determine whether the term "sensor" should be construed to encompass software. *See Vivid Techs.*, 200 F.3d at 803.

2. *"function"*

Petitioner contends that the term "function" "should simply be accorded its ordinary and customary meaning." Reply 5–6.

Patent Owner proposes we construe the term "function" to mean "a relation from a domain to a codomain in which exactly one member of the codomain is assigned to each member of the domain." PO Resp. 17. In support of this construction, Patent Owner relies on definitions of "function" and "binary relation" in math text books. *Id.* at 17–19. According to Patent Owner's expert, Dr. Almeroth, undergraduate engineering and math students would have known of these definitions and agreed with them. Ex. 2026 ¶ 94. Patent Owner further argues that Petitioner's expert, Dr. Heppe, testified that he had no reason to disagree with the definitions set forth in the math textbooks. PO Resp. 19–21. Dr. Almeroth also opines that a person of ordinary skill in the art would have understood the term "function" in the programming context to refer to a particular type of subprogram that outputs a value for a given set of input values. Ex. 2026 ¶ 94.

The '780 patent does not expressly define the term "function." Accordingly, the term "function" is presumed to have its ordinary and customary meaning, as would have been understood by one of ordinary skill in the art in the context of the entire patent disclosure. *In re Translogic Tech*, 504 F.3d at 1257. The '780 specification describes a system for monitoring, reporting, and controlling remote systems and for system information transfer, wherein the system includes sensors and actuators that are interfaced with wireless transceivers and controlled remotely. Ex. 1001, 3:1–19. The '780 patent specification describes buttons on a radio frequency ("RF") transmitter, (e.g., buttons labeled 1–4). Ex. 1001, 9:17–

35, Fig. 3D. When a user depresses a button, the feature or function associated with that button may be, for example, to indicate an emergency. *Id.* at 9:17–35. Figure 3D of the '780 specification depicts exemplary functions including "Temperature Set," "On/Off," "Actual Temperature," and "Air/Heat." Ex. 1001, Fig. 3D. The '780 specification, therefore, describes "functions" as being "features" of a transmitter. *See also id.* at 9:25–28 ("Furthermore, additional codes may be provided as necessary to accommodate additional functions or features of a given transmitter 320."). The '780 patent provides another example in which the term function is used to describe control tasks:

> Program code within the memory 424 may also be provided and configured for controlling the operation of a CPU to carry out the various ***functions*** that are orchestrated and/or controlled by local gateway 210. For example, memory 424 may include program code for controlling the operation of the CPU 422 to evaluate an incoming data packet to determine what action needs to be taken. In this regard, look up tables 425 may also be stored within memory 424 . . . [a] look up table may be used to associate function codes with the interpretation thereof. For example, a unique code may be associated by a look up table to identify ***functions*** such as test, temperature, smoke alarm active, security system breach, etc.

(Ex. 1001, 11:40–48, 56–60) (emphases added).

The '780 specification also describes functions as being tasks in the context of local controller 110 that "provides power, formats and applies data signals from each of the sensors to predetermined process control functions, and returns control signals as appropriate to the system actuators." *Id.* at 5:46–50.

The claim language uses the term function in a manner that is consistent with the understanding that a function is a task, or a feature or

capability. Claim 4 recites that the controller is configured to implement a function in response to receiving a data packet containing a function code (*id.* at 19:14–16), and claim 6 recites "function codes corresponding to a number of functions the controller can implement" (*id.* at 19:22–25).

We find that the positions of Patent Owner and its expert are not credible, and we determine that Patent Owner's proposed construction of "function" is too narrow in view of the '780 specification and claims. As Petitioner contends, the '780 patent is not concerned with mathematical functions. *See* Reply 3–4. The '780 specification and claims do not describe mathematical functions. *See id.* Dr. Almeroth's opinion that an undergraduate math or engineering student would have agreed with the mathematical definitions of "function" does not persuade us of a different result because an undergraduate engineering or math student is not a person of ordinary skill in the art *in the field of the '780 patent* under either expert's description of ordinary level of skill in the art, or under the ordinary level of skill in the art that we have adopted for purposes of this Decision. Moreover, Dr. Almeroth does not indicate whether the undergraduate math or engineering student would have understood that the mathematical definitions of the term "function" applied to the '780 patent, rather than simply whether the definitions were correct in the context of discrete mathematics. *See* Ex. 2026 ¶ 94.

Patent Owner's argument that "Dr. Heppe repeatedly testified under oath that he had no reason to disagree with the standard definition of the claim term 'function' as set forth in [the] text books [relied on by Patent Owner]" is disingenuous. PO Resp. 19. Dr. Heppe was never asked, during his deposition, whether the definitions related to the level of skill in the art

in the field of the ’780 patent, or whether the definitions were relevant to how the term “function” is used in the context of the ’780 patent. *See generally* Ex. 2025. For example, with respect to the definition of a “binary relation” on which Patent Owner relies in support of its proposed construction of “function,” Dr. Heppe testified that “this is at least one definition of how a person of ordinary skill in the art would understand a binary relation alpha from a set A to a set B.” *Id.* at 34:14–17. Dr. Heppe, however, continued to testify that “[y]ou haven’t provided me any context as it relates to the knowledge of a person of ordinary skill or how you believe it may relate to this case.” *Id.* at 34:20–35:1. Dr. Heppe opines in a supplemental declaration that Patent Owner’s mathematical interpretation of the term “function” is overly narrow, and that in view of the ’780 patent specification, its proper scope includes more generalized activities, tasks, and capabilities. Ex. 1041 ¶ 4. We find Dr. Heppe’s opinion to be credible in view of the portions of the ’780 specification we highlighted above that describe functions as features or tasks to be performed.

Also, we are not persuaded by Patent Owner’s argument that its proposed construction of “function” is supported by the definition of “function” in the context of computer programming. *See* PO Resp. 22–25; Ex. 2026 ¶ 95. Patent Owner argues that its proposed construction is supported by a computer programming manual that describes a “function” as being “a specific type of subprogram that returns a particular output value (a member of the codomain) for a particular input (a member of the domain).” PO Resp. 22; Ex. 2026 ¶ 95. Patent Owner’s argument is flawed for several reasons. First, Patent Owner does not cite to anything in the programming manual that indicates that the definition of a programming “function” is

limited to situations in which exactly one member of the codomain is assigned to each member of the domain, as stated in Patent Owner's proposed construction. *See* PO Resp. 22–23. The portion of the programming manual upon which Patent Owner relies provides only an example of one type of function, and even that description does not indicate that a function is limited in the manner argued by Patent Owner. Ex. 2024, 340–341. The manual states that when computing a single value requiring several statements, a FUNCTION subprogram would be used. *Id.* Second, the programming manual upon which Patent Owner relies refers to functions as subroutines used to perform mathematical operations. *See, e.g.*, *id.* at 341 ("If the mathematics you want to perform are not available as a library function, it is possible to design a 'home-made' function"). Neither the '780 specification nor the claims indicate that the term "function" as claimed is intended to refer only to programming subroutines that relate to mathematical operations. As we discussed above, the '780 specification refers to functions as being features such as "test," and "temperature," or as tasks, and the claim language uses the term function in a manner that is consistent with the understanding that a function is a task, or a feature or capability.

Accordingly, Patent Owner's proposed mathematical definition is too narrow, and is inconsistent with the '780 specification and claims.

For purposes of this Decision, we determine that the term "function" encompasses "features" or "parameters" of a system, and also encompasses "capabilities" and "tasks to be performed."

3. *"function code"*

Petitioner proposes we construe the term "function code" to mean "code corresponding to a function or condition." Reply 6. Patent Owner proposes we construe the term to mean "a symbol representing a function or the output of a function." PO Resp. 26.

The '780 patent does not expressly define the term "function code." Accordingly, the term "function code" is presumed to have its ordinary and customary meaning, as would have been understood by one of ordinary skill in the art in the context of the entire patent disclosure. *In re Translogic Tech*, 504 F.3d at 1257.

Even though the '780 specification does not define the term "function code," it provides the following description of function codes:

> [A] function code is communicated from RF transmitter 320 to the nearby transceiver. FIG. 3A illustrates a lookup table 325 that may be provided in connection with data formatter 324. Lookup table 325 may be provided to assign a given and unique function code for each button pressed. For example, transmit button 327 may be assigned a first code to identify the party depressing the button. The emergency button 329 may be assigned a second code. Furthermore, additional codes may be provided as necessary to accommodate additional functions or features of a given transmitter 320. Thus, in operation, a user may depress the emergency button 329 . . . The data formatter 324 may then use the information pertaining to the emergency button 329 to access a look up table 325 to retrieve a code that is uniquely assigned to emergency button 329.

Ex. 1001, 9:17–32. Exemplary functions described in the '780 specification include "test, temperature, smoke alarm active, security system breach, etc." (*id.* at 11:59–60), "Temperature Set, On/Off, Actual Temperature, Air/Heat" (*id.* at Fig. 3D), and "the condition of parking spaces" (*id.* at 13:57–59). The

’780 specification further describes associating a unique code “by a look up table to identify functions such as test, temperature, smoke alarm active, security system breach, etc.” *Id.* at 11:59–60. Lookup tables similarly are used to associate a transceiver identification number with a particular user. *Id.* at 11:54–55. Accordingly, the ’780 specification describes function codes as data associated with a function or feature that allows for identification of the function or feature.

Patent Owner argues that its proposed construction is consistent with the definition of “code” in *Webster’s New Collegiate Dictionary*: “a system of symbols (as letter, numbers, or words) used to represent assigned and often secret meanings.” PO Resp. 26 (citing Ex. 2027, 214). However, Patent Owner’s proposed definition is too narrow in view of the ’780 specification and claims. Patent Owner has not directed us to any evidence in the ’780 specification or claims that indicate the term “function code” is limited to “symbols representing a function or the output of a function.” The description in the ’780 specification does not limit the type of data a function code can be, but rather describes the function code in terms of being used in association with a look-up table to identify a corresponding function. Ex. 1001, 9:17–32. Similarly, the claims do not include language that limits “function code” to symbols representing a function or the output of a function. During reexamination (reexamination control no. 90/010,511) of U.S. Patent 6,891,838 (the “’838 patent”)—a patent similar to the ’780 patent, and which includes a Figure similar to Figure 3D of the ’780 patent—Patent Owner argued to the Patent Office that the patentee clearly

defined, by implication, the term "function code" in the specification.[7] Ex. 1021, 53–54; Ex. 3003, 18.

Patent Owner specifically argued, with respect to the term "function code," that "[i]t is well known that a patentee is his own lexicographer, and that "[i]n the ['838 patent] the claim 1 term 'function code' is clearly defined (at least by implication) by the patentee in the specification." Ex. 1021, 371–372; Ex. 3003, 18. Patent Owner argued that "[a] function code, as defined by the ['838] Patent is a set of bits that may be stored in a look-up table and corresponds to one or more functions." Ex. 1021, 371; Ex. 3003, 19. In making this admission to the Patent Office, Patent Owner relied on disclosure in the '838 patent that is identical to the disclosure in the '780 patent: "Distinct control system signals may be mapped to function codes used by the present invention in order to provide customer access to control system data." Ex. 3003, 18–19; Ex. 1021, 372 (citing the '838 patent, 4:59–61); Ex. 1001, 4:29–32 (disclosure identical to that in the '838 patent). We find that this characterization by Patent Owner is consistent with the '780 specification, which describes data that is stored in a look up table that corresponds to a function. Ex. 1001, 11:54–60, Fig. 3D.

Accordingly, we determine that the term "function code" means "bits of data corresponding to a function."

[7] We note that in district court litigation, Patent Owner argued, with respect to '838 patent, that no construction of the term "function code" was necessary, and in the alternative, that the correct construction is "a code corresponding to one or more functions" (similar to Petitioner's proposed construction in this proceeding). Ex. 1021, 51, 56–57.

C. Principles of Law

To prevail in its challenges to the patentability of the claims, Petitioner must prove its proposition by a preponderance of the evidence. 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d). Also,

> Section 103 forbids issuance of a patent when "the differences between the subject matter sought to be patented 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) (quoting 35 U.S.C. § 103).

D. The '780 Patent's Claim of Priority

The application for the '780 patent, U.S. Application No. 13/855,452 (the "'452 application"), was filed on April 2, 2013. Ex. 1001. The application to which the '780 patent claims priority, U.S. Application No. 13/173,499 (the "'499 application") issued as U.S. Patent No. 8,212,667 on July 3, 2012, several months prior to the filing of the application leading to the '780 patent. Exs. 1001, 1002. Accordingly, there is no co-pendency between the '780 patent and the '499 application. As a result, the earliest claim of priority to which the '780 patent is entitled is April 2, 2013, the filing date of the '452 application.[8]

[8] With respect to the unpatentability grounds involving Kahn, for purposes of assessing the level ordinary level of skill in the art, as well as obviousness, we apply Patent Owner's alleged priority date, October 5, 1999 (i.e., the date to which Patent Owner seeks to correct the priority claim of the '780 patent). PO Resp. 32. However, our determination is no different than if we had applied a date of April 2, 2013, based on the priority date of Kahn being November 1978 as discussed in detail *infra*.

On May 26, 2016, nearly one month after the filing date accorded to the petition in this proceeding, Patent Owner filed, with respect to the ’780 patent, both a Request for a Certificate of Correction (Ex. 1023) and Petition to Accept an Unintentionally Delayed Priority Claim and for Expedited Consideration (Ex. 1022) (collectively, “First Request.”). Patent Owner filed the First Request without seeking prior authorization from the Board, and did not notify the Board or Petitioner after the filing. Petitioner asserts that it learned of the First Request as a result of a search of the Public Patent and Application Information Retrieval (“PAIR”) system. *See*, *e.g.*, Paper 10, 2. It is Petitioner who informed the Board of the First Request.

On July 2, 2016, we issued an order staying the First Request pending our decision on institution. Paper 10, 4. Our order also precluded Patent Owner, during the pendency of this proceeding, from filing additional papers to correct the claim of priority of the ’780 patent without prior authorization from the Board. *Id.*

On November 2, 2016 we instituted *inter partes* review in this proceeding, and lifted the stay with respect to the First Request, noting that we “defer to the determination of the Petitions Branch regarding Patent Owner’s claim of priority.” Paper 18, 11.

Patent Owner’s First Request sought to amend the ’780 priority claim to an application that Patent Owner alleges shares co-pendency with the ’452 application, U.S. Application 13/222,216. Ex. 1022, 2; Ex. 1023, 2. On November 14, 2016, the Petitions Branch granted Patent Owner’s request for expedited review of Patent Owner’s petition, but otherwise dismissed the petition for failure to comply with 35 U.S.C. § 120 and 37 C.F.R.

§ 1.78(d)(2), which requires a reference be filed in an Application Data Sheet. Ex. 3001.

Pursuant to our July 27, 2016 Order (Paper 10), Patent Owner subsequently sought, and we granted, authorization to file a second Request for a Certificate of Correction and Petition to Accept an Unintentionally Delayed Priority Claim and for Expedited Consideration (collectively, "Second Request"). Paper 20, 3. On January 20, 2017, the Petitions Branch granted Patent Owner's request for expedited review of Patent Owner's petition, but dismissed Petitioner's request for correction of the '780 patent's priority date for failure to "make a reference to the first (earliest) application and every intermediate application." Ex. 3002, 2. The chain of priority in Patent Owner's petition did not match the chain of priority in the reference to which Patent Owner sought to claim priority. *Id.*

Patent Owner subsequently sought our authorization to file a third Request for a Certificate of Correction and Petition to Accept an Unintentionally Delayed Priority Claim and for Expedited Consideration with the Petitions Branch (collectively, "Third Request"). We ordered Patent Owner to show cause why we should authorize it to file a Third Request. Paper 24. Patent Owner's response to our Order to Show Cause alleged that the mistakes in the Second Request were due to an inadvertent omission, but Patent Owner did not explain any particular circumstances that would justify its mistakes. Paper 26, 3. We found that Patent Owner's demonstrated pattern of making mistakes indicated deliberate indifference toward avoiding errors. *See id.* Under the circumstances, we exercised our authority pursuant to 37 C.F.R. § 42.3, and denied Patent Owner's request to file a Third Request. *Id.* at 4. Patent Owner subsequently filed a request for

rehearing (Paper 28), which we denied, noting:

> Patent Owner has made several errors and mistakes throughout Patent Owner's attempts to make a claim of priority with respect to U.S. Patent No. 8,754,780 B2 (the "'780 patent"), including during prosecution of the application leading to the '780 patent (*see, e.g.*, Paper 13, 1–5; Ex. 1022–1034; Paper 15; Ex. 2011–2021), during prosecution of the application to which Patent Owner seeks to claim priority (i.e., Application No. 12/477,329) (*see, e.g.*, Ex. 3002, 2), and in the First Request (*see, e.g.*, Ex. 3001) and Second Request (*see, e.g.*, Ex. 3002). In our Order [Paper 24], our finding regarding Patent Owner's "repeated mistakes" was in reference to Patent Owner's demonstrated pattern of making errors it should have recognized and could have avoided with the exercise of minimal diligence. Paper 27, 3. In the Response to our Order to Show Cause, Patent Owner did not provide sufficient justification for the failure to avoid making error after error.

Paper 31, 3.

In conjunction with entering this Decision, we hereby lift the stay prohibiting Patent Owner from filing Patent Owner's Third Request, and defer to the determination of the Petitions Branch regarding Patent Owner's claim of priority.

E. Patent Owner's Observations on Cross-Examination

Patent Owner filed Patent Owner SIPCO LLC's Observations on Cross-Examination of Dr. Heppe (Paper 33), related to the May 19, 2017 deposition testimony of Dr. Heppe (Ex. 2037). Petitioner filed Petitioner's Response to Observations. Paper 35. The Office Patent Trial Practice Guide states that observations should be in the following form:

> In exhibit __, on page __, lines __, the witness testified __. This testimony is relevant to the __ on page __ of __. The testimony is relevant because __.

Office Patent Trial Practice Guide, 48 Fed. Reg. 48756, 48768 (Aug. 14, 2012).

Petitioner responds that Patent Owner's observations should be expunged from the record or not considered because Patent Owner has failed to follow the form noted above, in particular the portion providing that "[t]his testimony is relevant to the __ on page __ of __. The testimony is relevant because __." Resp. to Obs., 1 n.1 (emphasis omitted). We disagree with Petitioner that Patent Owner failed to follow, in substance, the form set forth in the Office Patent Trial Practice Guide, at least with respect to observations 1, 4, 5, and 7. For example, Patent Owner observes that certain testimony directly contradicts Petitioner's position, at pages 3–5 of the Petitioner's Reply, that mathematics is separate and distinct from the field of the '780 patent. Obs., 4. In substance, this addresses "[t]his testimony is relevant to the __ on page __ of __." Patent Owner states the testimony "is relevant because" and provides reasoning, which follows the form "[t]he testimony is relevant because." *Id.* With respect to observations 2, 3, and 6, we agree with Petitioner that Patent Owner fails to provide citation regarding the relevancy of the testimony (i.e., "[t]his testimony is relevant to the __ on page __ of __."). However, even though observations 2, 3, and 6 do not comply with the form "[t]his testimony is relevant to the __ on page __ of __", the observations state the relevance in terms of whether Dr. Heppe is a person of ordinary skill in the art. *See generally* Obs.

Petitioner also provides substantive responses to Patent Owner's observations. Petitioner argues that Patent Owner's observations 1–3 and 5–7 are not relevant to any issue in this proceeding, and that Patent Owner mischaracterizes Dr. Heppe's testimony. *See generally* Resp. to Obs.

We determine that Patent Owner's observations are compliant with respect to observations 1, 4, 5, and 7, but are non-compliant with respect to observations 2, 3, and 6. However, noted above, observations 2, 3, and 6 state the relevance in terms of whether Dr. Heppe is a person of ordinary skill in the art. Under the present circumstances, we refrain from declining to consider Patent Owner's observations. We are mindful of Petitioner's responses that the observations are not relevant to this proceeding. We disagree because the observations are relevant to positions taken by the parties and to issues in this proceeding, and to Patent Owner's allegations regarding the level of skill of Dr. Heppe. Petitioner's responses bear on the credibility of Patent Owner's observations and the weight they should be accorded, but do not persuade us to decline consideration of Patent Owner's observations.

F. Asserted Obviousness of Claims 1–15 over the '732 Patent

Petitioner asserts that claims 1–15 of the '780 patent are unpatentable as obvious over the '732 patent. Pet. 20–32. Petitioner proffers a declaration and supplemental declaration of Dr. Heppe to support its contentions. Exs. 1018, 1041. Patent Owner disputes Petitioner's contentions, arguing that the '732 patent is not available as prior art. PO Resp. 32–34. We have reviewed the record, and we determine that Petitioner has shown by a preponderance of the evidence that claims 1–15 of the '780 patent are unpatentable as obvious over the '732 patent.

1. *Overview of the '732 Patent (Ex. 1012)*

The '732 patent issued from U.S. Application No. 12/477,329 (the "'329 application"), filed on June 23, 2009. Ex. 1012. As we discussed above, the '780 patent, as issued, claims to be a continuation of the '499

application. *Id.* In its attempt to correct its priority claim, Patent Owner seeks instead to claim priority to U.S. Application 13/222,216 (the "'216 application"), filed August 31, 2011, which issued as U.S. Patent No. 8,410,931 (the "'931 patent") on April 2, 2011. Exs. 1022, 1023. The '931 patent identifies itself as a continuation of the application leading to the '732 patent. Ex. 3004 at [63]. Accordingly, with respect to the '780 patent, Patent Owner seeks to claim priority, through a series of continuations, to the application leading to the '732 patent. Patent Owner, therefore, must take the position that the '780 patent claims do not contain any new matter not present in the '732 patent disclosure. *See* 35 U.S.C. § 132. Neither party disputes that the '780 and '732 specifications are identical, but for the "cross-reference to related applications & priority claims." *See*, e.g., Ex. 1013 (Petitioner-generated document comparing the '780 and '732 specifications).

2. *Analysis*

As we discussed above, the '780 patent and '732 patent share nearly the same specification. Ex. 1013; Ex. 1001; Ex. 1012. The '780 patent and '732 patent also share nearly identical claims. Ex. 1013; Ex. 1001; Ex. 1012. Petitioner alleges that claims 1–15 of the '780 patent are "completely encompassed by the nearly identical limitations in claims 13–25 of the '732 [p]atent," and cites to the declaration of Dr. Heppe for support. Pet. 20 (citing Ex. 1018 ¶¶ 18–32). Petitioner also provides a table in which claims 1–15 of the '780 patent are listed alongside corresponding claims of the '732 patent for a side-by-side comparison of claim language. Pet. 21–29.

Reproduced below is Petitioner's comparison of claim 1 of the '780 patent with claim 13 of the '732 patent, in which Petitioner highlights the

language that is identical between the claims, and the un-highlighted language indicates language that is different between the claims (*id.* at 21–22):

8,754,780 Claims	8,013,732 Claims (Prior Art)
1. In a system comprising a plurality of wireless devices, a device comprising:	13. In a system comprising a plurality of wireless devices configured for remote wireless communication and comprising a device for monitoring and controlling remote devices, the device comprising:
a transceiver having a unique identification code and being electrically interfaced with a sensor, the transceiver being configured to receive select information and identification information transmitted from a second wireless transceiver in a predetermined signal type;	a transceiver having a unique identification code and being electrically interfaced with a sensor, the transceiver being configured to receive select information and identification information transmitted from another wireless transceiver in a predetermined signal type;
the transceiver being further configured to wirelessly retransmit in the predetermined signal type the select	the transceiver being further configured to wirelessly retransmit in the predetermined signal type the select

8,754,780 Claims	8,013,732 Claims (Prior Art)
information, the identification information associated with the second wireless transceiver, and transceiver identification information associated with the transceiver making retransmission; and	information, the identification information associated with the nearby wireless transceiver, and transceiver identification information associated with the transceiver making retransmission; and
a controller operatively coupled to the transceiver and the sensor, the controller configured to control the transceiver and receive data from the sensor, the controller configured to format a data packet for transmission via the transceiver, the data packet comprising data representative of data sensed with the sensor.	a data controller operatively coupled to the transceiver and the sensor, the data controller configured to control the transceiver and receive data from the sensor, the data controller configured to format a data packet for transmission via the transceiver, the data packet comprising data representative of data sensed with the sensor.

Petitioner identifies the following differences between these claims. The preamble of claim 13 of the ’732 patent is identical to the preamble of claim 1 of the ’780 patent except that claim 13 further recites that the wireless devices are “configured for remote wireless communication” and that the claimed system comprises “a device for monitoring and controlling remote devices.” Pet. 21. Also, claim 13 of the ’732 patent recites “another wireless transceiver” and “the nearby transceiver,” whereas claim 1 of the ’780 patent recites “a second transceiver,” and “the second wireless transceiver,” respectively. *Id.* at 21–22. Furthermore, claim 13 of the ’732 patent recites “a data controller,” whereas claim 1 of the ’780 patent recites

"a controller." *Id.* at 22. Petitioner argues that the differences between claim 1 of the '780 patent and claim 13 of the '732 patent are not substantive. Pet. 29–30. Similarly, as to claims 2–15 of the '780 patent, Petitioner identifies what it alleges to be non-substantive differences as compared with claims 13–25 of the '732 patent. *Id.* at 22–31.

Petitioner also argues that if claims 1–15 of the '780 patent are supported by the '780 specification, then the claims must be taught by the nearly identical '732 patent specification. *Id.* at 32.

We agree with Petitioner that any differences in claim language between the '780 claims and '732 corresponding claims are non-substantive, and that any differences are taught by the '732 patent specification and would have been obvious in view of the '732 patent specification and claims.

With regard to claim 1 of the '780 patent, the preamble of claim 13 clearly teaches what is recited in the preamble of claim 1 of the '780 patent because claim 13 of the '732 patent includes identical recitations, and its teaching is not negated by the additional recitations. The recitation in claim 1 of the '780 patent of a "*second* transceiver" is taught by "*another* transceiver" or "*nearby* transceiver," as recited in the '732 patent. Indeed, another transceiver or a nearby transceiver is a second transceiver because it is in addition to the first transceiver. Claim 1 of the '780 patent's recitation of "a controller" is taught by, or would have been obvious in view of, the '732 patent's recitation of "a data controller." The "controller" and "data controller" in both claims are operatively coupled to the claimed transceiver and sensor, and both are configured identically. Removal of the word "data"

from "data controller," therefore, does not render claim 1 of the '780 patent unobvious.

The recitations of claim 3 of the '780 patent are identical to the recitation of the corresponding '732 claim, claim 15. Pet. 23.

Regarding claims 2 and 4–6 of the '780 patent, which depend from claim 1, the only difference in claim language with the corresponding '732 claims, claims 14, 16, and 18, is the recitation of "controller," rather than "data controller." This difference is non-substantive for the reasons discussed above regarding claim 1 of the '780 patent. *Id.* at 22–24.

Claim 8 of the '780 patent recites "[t]he device of claim 1, wherein the second transceiver is nearby to the transceiver," but the corresponding '732 claim, claim 13, teaches a second nearby transceiver because it recites identification information of a transceiver that is "associated with the nearby wireless transceiver." *Id.* at 25.

Regarding claim 9 of the '780 patent, the corresponding claim of the '732 patent, claim 20, teaches all the recitations of the preamble of claim 9 of the '780 patent, but includes additional recitations, namely "remote devices for monitoring and controlling remote devices having wireless communication devices," and that the thermostat is "wireless enabled." *Id.* at 25–27. Claim 9 of the '780 patent also recites that the claimed transceiver is a "wireless transceiver," whereas claim 13 of the '732 patent recites "a transceiver," but claim 20 of the '732 patent teaches a wireless transceiver because the claim is directed to a wireless system, having wireless communication devices, and recites that the claimed "transceiver" is configured to receive information from "another wireless transceiver." *Id.* at 20. Use of the term "another" indicates the claimed "transceiver" also is

"wireless." Claim 9 of the '780 patent also recites a "second wireless transceiver" instead of "another wireless transceiver," as recited in claim 20 of the '732 patent, but for reasons discussed above, this difference does not negate obviousness because "another" transceiver is a "second" transceiver. *Id.* at 26.

With regard to claims 10–14 of the '780 patent, the corresponding claims of the '732 patent, claims 21–25, refer to a "wireless enabled thermostat device," whereas the '780 claims recite "thermostat device." *Id.* at 27–29. This difference is non-substantive. The preamble of claim 9, from which claims 10–14 depend, recites "a thermostat device comprising," rather than a "wireless enabled thermostat device comprising," as recited in the corresponding '732 claim, from which claims 21–25 of the '732 patent depend. However, the thermostat device recited in claim 9 of the '780 patent is wireless, because claim 9 recites that the thermostat device comprises a wireless transceiver. Accordingly, there is no substantive difference between the "thermostat device" comprising a wireless transceiver as claimed in the '780 patent and the "wireless thermostat enabled device" taught in the '732 patent.

With regard to claim 15 of the '780 patent, which recites that the second transceiver is "nearby," this is taught by claim 20 of the '732 patent which recites a transceiver "associated with the nearby wireless transceiver." *Id.* at 29.

Patent Owner does not dispute that claims 1–15 of the '780 patent are taught by claims 13–25 of the '732 patent and by the '732 specification. *See generally* PO Resp. Rather, Patent Owner argues that the '732 patent is not available as prior art to the '780 patent under a "correct" priority date for the

’780 patent. *Id*. at 32–34. As we discussed above, however, at this stage of the proceeding the priority date of the ’780 patent has not been corrected, and we, therefore, consider it as prior art. Accordingly, we determine that the ’732 patent teaches the recitations of claims 1–15 of the ’780 patent.

Upon review of the record in this proceeding, we determine that Petitioner has demonstrated by a preponderance of the evidence that claims 1–15 of the ’780 patent are unpatentable under § 103 as obvious over the ’732 patent.

G. Asserted Obviousness of Claims 1, 2, and 7 over Kahn in view of the APA

Petitioner contends that claims 1, 2, and 7 of the ’780 patent are unpatentable as obvious over Kahn in view of the APA. Pet. 17–18, 32–41. Petitioner proffers a declaration and supplemental declaration of Dr. Heppe to support its contentions. Exs. 1018, 1041. Patent Owner disputes Petitioner’s contentions, arguing that the claims would not have been obvious. PO Resp. 44–74. Patent Owner proffers two declarations of Dr. Almeroth to support its assertions. Exs. 2001, 2026. We have reviewed the record, and we determine that Petitioner has shown by a preponderance of the evidence that claims 1, 2, and 7 of the ’780 patent are unpatentable as obvious over Kahn in view of the APA.

1. *Overview of Kahn (Ex. 1015)*

Kahn is a journal article from Proceedings of the IEEE, and is dated November 1978. Ex. 1015, 1468. Petitioner asserts that Kahn qualifies as prior art under 35 U.S.C. §§ 102(a) and 102(b). Pet. 13. Patent Owner does not dispute Petitioner’s assertion. For purposes of this decision, we are satisfied that Kahn qualifies as prior art under 35 U.S.C. §§ 102(a) and 102(b).

Kahn discusses "the basic concepts of packet radio." Ex. 1015, Abstract. In particular, Kahn describes PRNET, a multi-hop, multiple access packet radio network ("PR network"). *Id.* at 1469, col. 1. Kahn notes that the network "should be capable of internetting in such a way that a user providing a packet address in another net can expect his network to route the associated packet to a point of connection with the other net or to an intermediate (transit) net for forwarding." *Id.* at 1470, col. 1.

The packet radios in Kahn's network "contain[] the antenna, RF transmitter/receiver, and all signal processing and data detection logic." *Id.* at 1477, col. 2. In addition, each radio contains a microprocessor controller plus a semiconductor memory for packet buffering and software. *Id.* Each packet radio has an identifier known as its "selector" that is used in routing and control procedures. *Id.* at 1479, col. 1. These selectors may be "unique and preassigned." *Id.* at 1470 n.1.

Packets are transmitted to a destination using a store-and-forward method. *Id.* In this method, a user generated packet with associated addressing and control information in the packet's header is sent to the packet radio for processing. *Id.* The packet radio adds network routing and control information and transmits the packet to a nearby packet radio, called a repeater, which is identified within the packet. *Id.* at 1477, cols. 1, 2. The repeater processes the header to ascertain whether it should relay the packet, deliver it to an attached drive, or discard it. *Id.* at 1477, col. 2. The packet will be relayed repeater to repeater until it reaches the final repeater, which broadcasts it to the destination packet radio. *Id.*

An exemplary packet consists of a 48-bit preamble followed by a variable length header that is followed by the text and a checksum. *Id.* at

1478, col. 2. In routing the packet, a station can send the entire path directly to the sending or receiving packet radio and in this case, the transmitted packet "could then contain the entire set of selectors in its header." *Id.* at 1479, col. 2.

2. *Overview of the APA (Ex. 1001)*

Petitioner alleges that the '780 specification makes several admissions regarding the scope of the prior art. Pet. 16. Petitioner refers to such admissions as admitted prior art ("APA"). *Id.* Petitioner points out that the '780 specification provides that there were known "a variety of known 'systems for monitoring and controlling manufacturing processes, inventory systems, emergency control systems, and the like.'" *Id.*; *see also* Ex. 1001, 1:50–56. The '780 specification further discloses that "[m]ost automatic systems use remote sensors and controllers to monitor and automatically respond to system parameters to reach desired results." *Id.* at 1:62–65. Petitioner also refers to Figure 1 of the '780 patent, which is described as depicting a "prior art control system 100." *Id.* at 5:42–43; Fig. 1. Prior art control system 100 includes a plurality of sensor actuators 111–117 that are electrically coupled to local controller 110. *Id.* at 5:43–46; Fig. 1. The '780 specification further discloses that "local controller 110 provides power, formats and applies data signals from each of the sensors to predetermined process control functions, and returns control signals as appropriate to the system actuators," in "a manner well known in the art of control systems." *Id.* at 5:46–50.

The '780 specification also states that "[t]he typical approach to implementing control system technology is to install a local network of hard-wired sensors and actuators along with a local controller." *Id.* at 2:44–47.

The ’780 specification further states:

> Prior art control systems consistent with the design of FIG. 1 require the development and installation of an application-specific local system controller, as well as, the routing of electrical conductors to each sensor and actuator as the application requires . . . These systems require electrical coupling between the local controller and system sensors and actuators. As a result, appropriately wiring an existing industrial plant can be a dangerous and expensive proposition.

Ex. 1001, 5:57–6:3.

Figure 1 of the ’780 patent is reproduced below:

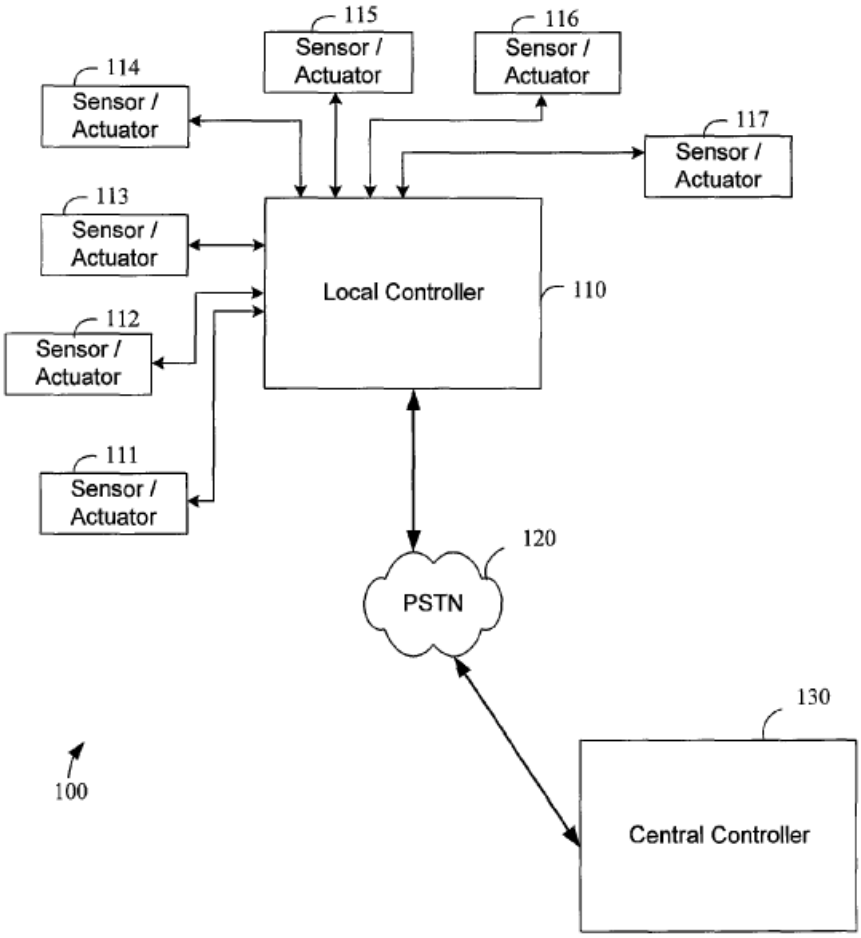

FIG. 1
(PRIOR ART)

Ex. 1001, FIG. 1. Figure 1 depicts Sensor/Actuators 111–117 connected using wires to Local Controller 110.

3. *Analysis*

Petitioner relies on Kahn as teaching the limitations of claims 1, 2, and 7 with the exception of the claimed “sensor” and “actuator.” *Id.* at 17–18, 32–41. Petitioner relies on the APA for teaching a “sensor” and

"actuator." *Id.* at 17–18, 34–35, 38–39. In an alternative analysis, Petitioner argues that Kahn teaches the claimed sensors. *Id.* at 35–36.

As we discussed above, Kahn describes a wireless PR network, PRNET, comprised of devices that communicate wirelessly using packet radios that have wireless transceivers. *See supra* Section II.G.1. Kahn does not expressly disclose sensors and actuators for monitoring systems in its PR network, but Kahn discloses that although the original impetus for wireless PR networks was based on tactical military requirements, "the basic concept is applicable to an extremely wide range of new and innovative computer communication applications never before possible in any practical way." Ex. 1015, 1469. Accordingly, Kahn teaches that an extremely wide range of computer communication applications could be implemented using a wireless PR network. For the specific claim requirements that the transceiver of the wireless radio interface with a sensor and provide a control signal to an actuator, and that a controller receive data sensed with the sensor, Petitioner relies on Patent Owner's admissions in the '780 patent that wired computer communication systems including sensors and actuators for monitoring were well known in the prior art. Pet. 17–18, 36, 39–41.

Patent Owner does not dispute the combination of Kahn and the portions of the '780 specification Petitioner relies on as admitted prior art teaches all of the limitations recited in claims 1, 2, and 7 of the '780 patent. Rather, Patent Owners argues that Petitioner has not demonstrated that it would have been obvious to combine Kahn with the APA to arrive at the claimed invention, and that Petitioner relies on portions of the '780 patent that are not prior art. PO Resp. 43–65. The issue before us, therefore, is whether it would have been obvious to implement a wireless PR network, as

taught in Kahn, to include sensors and actuators such as those in the prior art systems described in the ’780 patent.

With respect to the preamble of claim 1, which recites “a system comprising a plurality of wireless devices,” Petitioner relies on Kahn’s teaching of a wireless PR network that comprises a plurality of packet radios. *Id.* at 32–33. We are persuaded by Petitioner’s arguments and evidence that Kahn’s wireless PR network, comprised of a plurality of packet radios that receive and transmit data wirelessly, discloses “a system comprising a plurality of wireless devices.” Patent Owner does not dispute that Kahn teaches the preamble of claim 1.

With respect to “a transceiver,” as recited in claim 1, Petitioner argues that each packet radio in Kahn includes an “RF transmitter/receiver.” *Id.* at 34. Petitioner argues that each transceiver has a unique identification code, as recited in claim 1, because “[e]ach of Kahn’s radios ‘has an identifier’” called “its selector,” wherein each selector is unique. *Id.* (citing Ex. 1015, 1479). We are persuaded by Petitioner’s arguments and evidence that the “RF transmitter/receiver” disclosed in Kahn is a “transceiver,” as recited in claim 1, and that the unique selector in Kahn is a “unique identification code,” as recited in claim 1. Patent Owner does not dispute that Kahn teaches these limitations.

Claim 1 further recites that the transceiver is “electrically interfaced with a sensor.” Petitioner argues that Kahn alone teaches this feature, and in the alternative, that the APA teaches this feature. Pet. 34–36.

We are not persuaded that Kahn alone teaches this feature. Petitioner argues that Kahn discloses a sensor in the form of a microphone. Pet. 35–36. In particular, Kahn discloses that PR networks provide high throughput,

low delay means to interconnect a community of (potentially) mobile computer users, wherein a number of operations may be interactive and involve input via remote user entry. Ex. 1015, 1469, col. 2. Kahn further explains that "[a]lthough the primary objective of the net is to provide service to computer communication traffic, other types of service, such as might be required for real-time speech, can be accommodated." *Id.* at 1469, col. 2 – 1470, col. 1. Petitioner gleans from this disclosure that Kahn discloses a microphone. Pet. 35 (citing Ex. 1018 ¶ 60). Even if services required for real-time speech would have necessitated a microphone to sense audible signals, Petitioner has not shown that the packet radio transceivers in Kahn would have been electrically interfaced with such a microphone, as required by claim 1. The Petition fails to provide any argument that the alleged microphone would have been electrically interfaced with a transceiver. Pet. 35–36. Petitioner's expert, Dr. Heppe, reaches the conclusion that a person of ordinary skill in the art would have understood the microphone to be associated with a computer terminal, wherein the terminal is interfaced with a packet radio. Ex. 1018 ¶ 60. Even if we accepted this to be true, Dr. Heppe's opinion shows only that the microphone would have been interfaced with a computer terminal, but not with a transceiver of the packet radio. Packet radios were distinct units from the computer terminal to which Dr. Heppe refers as being connected to a microphone. *See, e.g.*, Ex. 1015, Fig. 6. Accordingly, interfacing a microphone with a computer terminal would not have been the same thing as interfacing with the transceiver of the packet radio.

We are persuaded, however, by Petitioner's arguments relating to the APA's teaching of a sensor. Petitioner argues that the '780 patent admits

that prior art systems for monitoring and controlling used remote sensors and actuators to monitor and automatically respond to system parameters. Pet. 35 (citing Ex. 1001, 1:60–65; Ex. 1018 ¶ 61). We agree with Petitioner, and find the ’780 patent admits that prior art control systems included sensors and actuators that were hard-wired to controllers. Specifically, the ’780 specification describes what it admits are “[p]rior art control systems consistent with the design of FIG. 1,” that include sensors and actuators 111–114 that are interfaced with local controller 110 via hard-wired connections. Ex. 1001, 5:41–46, 5:57–58, 5:66–6:3, Fig. 1. Furthermore, we agree with Petitioner that the ’780 specification concedes that in admitted prior art systems a local controller would return control signals to system actuators, and that the actuators were configured to receive such commands and implement them, as required by claims 2 and 7. Pet. 40–42. The ’780 specification describes, with reference to Figure 1 which “illustrat[es] certain fundamental components of a prior art control system 100,” local controller 110 that returns control signals as appropriate to system actuators. Ex. 1001, 5:41–50.

Petitioner argues that a skilled artisan would have understood that Kahn’s controller could be coupled to the sensors and actuators described in the APA in order to assemble data from the sensor into packets for transmission by Kahn’s transceiver and to send control signals to associated actuators to carry out commands indicated by the control signal. Pet. 35 (citing Ex. 1018 ¶ 61); Pet. 40 (citing Ex. 1018 ¶¶ 72–76; Ex. 1015, 1494, col. 1). Petitioner’s arguments are supported by the expert testimony of Dr. Heppe, who opines that a person of ordinary skill in the art could have achieved the combination of the APA’s sensors with Kahn’s PR network

without undue experimentation and with predictable results because "[p]rior art sensors and actuators, intended for 'third-party' integration into control systems such as those disclosed in the APA of the '780 patent, have well defined behaviors and interface specifications to enable such integration with relative ease (i.e., without undue experimentation), and with predictable results." Ex. 1018 ¶ 42. We find credible Dr. Heppe's testimony that prior art sensors and actuators would have had well-defined behaviors and interface specifications to enable their integration into control systems with relative ease. The '780 specification states that "[a]s is known, there are a variety of systems for monitoring and controlling," and describes sensors and actuators as being used in most automatic systems for monitoring and controlling. Ex. 1001, 1:60–67. This description indicates that sensors and actuators were commonly used in monitoring and controlling systems, which is consistent with Dr. Heppe's testimony that the sensors and actuators would have had well-defined behaviors and could have been integrated into control systems with relative ease.

Petitioner provides multiple reasons why a skilled artisan would have been motivated to combine the teachings of Kahn with the APA. Pet. 17–18; Reply 9–15. We find convincing Petitioner's argument that Kahn provides motivation to combine, namely Kahn's teachings that use of a PR network avoids a known problem in the art, the need to install physical wires and cables to connect network components. Pet. 17–18 (citing Ex. 1015, 1468, col. 1). In particular, Petitioner argues that "Kahn clearly posits that a wireless system is faster to deploy than a wired system." Reply 14 (citing Ex. 1015, 1469). We agree that Kahn discloses that packet radio networks "permit mobile [(e.g., wireless)] application over a wide geographic area"

and "[t]he use of broadcast radio technology for local distribution of information can also provide a degree of flexibility in rapid deployment and reconfiguration not currently possible with most fixed plant [(e.g., wired)] installations." Ex. 1015, 1469, col. 1. According to Petitioner, a skilled artisan, in view of Kahn, "would have recognized the advantage of using the communication infrastructure disclosed in Kahn to allow the sensors and actuators of the APA to be moved from location to location without having to reinstall physical cables and wires to connect the sensors and actuators." Pet. 18 (citing Ex. 1018 ¶ 42).

Petitioner argues that Greeves supports Petitioner's argument that a skilled artisan would have understood the benefits of wireless communication links over wired physical links, and that the benefits include ease of set-up (i.e., rapid deployment). Reply 15 (citing Ex. 2004, 32, right col.). Greeves is a journal article dated 1994, and is cited by Petitioner in the Reply as demonstrating the state of the art at the time of the alleged '780 invention. Reply 12–13. Greeves relates to communication networks that employ radio telemetry, which Greeves states is ideal for industries such as water-supply and treatment, where multi-locational sites require a sophisticated communications network. Ex. 2004, 31. Greeves describes radio telemetry as a "means of communication without the existence of a physical connection between the transmitter and the receiver," (Ex. 2004, 31), and states that radio's "benefits over physical links include . . . ease of set-up and operation and greater cost-effectiveness." (Ex. 2004, 32). Greeves, therefore, corroborates Petitioner's argument, and Dr. Heppe's opinion, that a skilled artisan at the time of alleged invention of the '780 patent would have understood that a benefit of wireless network links over

physical links was flexibility in rapid deployment and reconfiguration. In particular, Dr. Heppe opines that a skilled artisan would have been motivated to combine Kahn's PR network with the APA in order to enhance flexibility and ease of deployment. *Id.* (citing Ex. 1018 ¶ 61). Dr. Heppe points out that

> Kahn specifically notes the use of packet radio in the mobile environment (Kahn, 1468–1469), and the advantage of broadcast radio technology (such as the PRNET discussed in the article) in terms of network deployment flexibility and reconfiguration, as compared with most fixed plant installations.

Ex. 1018 ¶ 42 (citing Ex. 1015, 1469, col. 1). Dr. Heppe further opines

> Kahn describes various reasons to rely on a packet radio network ("motivation to combine") including support for mobile users and bursty traffic, and flexibility in rapid deployment and reconfiguration not currently possible with most fixed plant installations. Kahn, pp. 1468-69. "Although the original impetus for packet radio development was and still is largely based on tactical military computer communication requirements [10], the basic concept is applicable to an extremely wide range of new and innovative computer communication applications never before possible in any practical way." Id. "Deployment of the packet radio net should be rapid and convenient, requiring little more than mounting the equipment at the desired location." Id., p. 1470. So Kahn provides explicit motivations to combine. Furthermore, one of skill in the art would recognize that the flexibility and convenience in deployment and reconfiguration, explicitly discussed by Kahn, stems in large measure from the avoidance of the need for network wiring.

Ex. 1041 ¶ 21.

We agree with Dr. Heppe that Kahn provides a rationale to use wireless PR networks to connect network components because Kahn

discloses that PR networks permit mobile applications over a wide geographic area and can also provide flexibility in rapid deployment and reconfiguration not currently possible with most fixed plant [(e.g., wired)] installations for local distribution of information. Ex. 1015, 1469, col. 1. Dr. Heppe's opinion that a skilled artisan would have recognized that mobility and flexibility and rapid deployment described in Kahn stems from the avoidance of needing wiring is supported by Greeves. Ex. 2004, 32, col. 2. Accordingly, we find credible Petitioner's argument and Dr. Heppe's opinion that a skilled artisan would have recognized that an advantage of using *wireless* packet radio networks was to avoid the need for *wires*, and that the skilled artisan would have been motivated to use a wireless packet radio network in order to permit mobile applications and to enhance flexibility in rapid deployment and reconfiguration not currently possible with wired installations. Petitioner and Dr. Heppe, therefore, have provided "articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *KSR*, 550 U.S. at 418 (citation omitted).

Petitioner argues an alternative motivation to combine based on disclosure in the '780 specification. Pet. 17–18. Petitioner relies on the disclosure that one of the problems the '780 patent set out to address was the "costs associated with the sensor-actuator infrastructure required to monitor and control functions within such systems." *Id.* at 17 (quoting Ex. 1001, 2:41–44). Indeed, the '780 specification discloses that "[p]rior art control systems consistent with the design of FIG. 1 . . . require electrical coupling between the local controller and system sensors and actuators. As a result, appropriately *wiring an existing industrial plant can be* a dangerous and *expensive* proposition." Ex. 1001, 5:56–6:3 (emphases added). Accordingly,

the ’780 specification clearly discloses that installing hard-wiring, as opposed to using a wireless network, can be dangerous and costly. Petitioner argues that combining Kahn’s wireless PR network with the sensors and actuators in the monitoring and control systems of the APA would have allowed a skilled artisan to reduce the expense associated with needing wires and cables to install sensors and actuators in remote locations. Pet. 20.

Patent Owner responds that Petitioner uses impermissible hindsight to reconstruct the claimed invention and that Petitioner’s arguments are based on an incorrect understanding of what constitutes the prior art. PO Resp. 50–57. In particular, Patent Owner relies on its expert’s opinion that the portions of the ’780 specification relied on by Petitioner’s expert do not discuss admitted prior art. *Id.* (citing Ex. 2001 ¶ 100). In his declaration, Patent Owner’s expert, Dr. Almeroth alludes, in pertinent part, to column 5, line 57 through column 6, line 3. Ex. 2001 ¶ 100. Dr. Almeroth opines that the problem the ’780 patent set out to solve was not to reduce the cost of wiring, but rather was to reduce the costs of “developing sensors, installing sensors, connecting sensors and controllers to the local controller, and installation and operation of the local controller.” *Id.* ¶ 104. Patent Owner’s argument is a straw man. Even if the ’780 patent set out to address problems other than just the cost of installing wiring, as alleged by Dr. Almeroth, that would not negate the clear teaching in the ’780 patent that installing hard-wired connections was expensive. In particular, we find the discussion in the ’780 specification, including express disclosure that “appropriately wiring an existing industrial plant can be a dangerous and expensive proposition,” indicates that it was well known that wiring could be costly,

and that this was a known problem in the art, rather than a problem recognized only by the inventor of the ’780 patent. *See* Ex. 1001, 5:57–6:3. The discussion is provided in the context of describing admitted “prior art” systems, and is offered in the context of what was known at the time.

We further note that Dr. Almeroth does not deny that it was well known at the time of the ’780 patent invention that installing wiring to connect network components could be expensive. Rather, he opines that the cost of wiring is not emphasized in the ’780 disclosure and would have been insignificant in comparison to other costs the ’780 invention sought to address. Ex. 2001 ¶ 104. Accordingly, Dr. Almeroth acknowledges that the expense of installing wiring was not one of the problems the ’780 patent sought to address, but rather was a well known problem in the art.

Greeves confirms that it was well known in the art that installing wiring to connect network components was expensive, and that such costs could be reduced by using wireless networks that did not require installing wiring. Reply 12–13. Greeves states that radio is “relatively cost-effective when compared with other physical links.” *Id.* Greeves, therefore, corroborates Petitioner’s argument, and Dr. Heppe’s opinion, that a skilled artisan at the time of alleged invention of the ’780 patent would have understood that using wireless network links was less costly than installing wires and cables in buildings for communications.

Patent Owner argued, at oral hearing, that we should not consider Greeves in determining the state of the art at the time of alleged invention because Greeves was not cited in the Petition. Tr. 73:21–74:8. We disagree with Patent Owner, and find that it is proper for us to consider Greeves in determining the state of the art. In *Ariosa Diagnostics v. Verinata Health,*

Inc., 805 F.3d 1359, 1365 (Fed. Cir. 2015), the Board declined to consider a brochure, even as evidence of the level of skill in the art, because it was not identified in the Petition as prior art defining a combination for obviousness. Our reviewing court held it was error to decline considering the brochure for purposes of determining the state of the art, noting that "[a]rt can legitimately serve to document the knowledge that skilled artisans would bring to bear in reading the prior art identified as producing obviousness," and that the brochure "had to be considered by the Board even though it was not one of the three pieces of prior art cited as the basis for obviousness." *Id.* (citation omitted). In *Ariosa*, the brochure at issue was produced with the Petition, and cited by the Petitioner's expert at the Petition stage as discussing the state of the art, whereas here, Greeves is introduced in the Reply. *Id.*; Reply 11–13. However, Petitioner's introduction of Greeves in the Reply is proper because it was introduced in reply to an argument by Patent Owner in the Response. *See* Reply 10–13. Accordingly, we may properly consider Greeves for the purposes of determining the knowledge of one of skill in the art in the relevant time frame.[9]

Moreover, Patent Owner has not been denied notice of the issues to be considered by the Board or an opportunity to address the facts and legal arguments upon which our final determination rests. *See Genzyme*

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[9] In *Emerson Electric Co., v. SIPCO, LLC*, an *inter partes* review involving a patent related to the '780 patent and involving the same parties as this proceeding, we declined to consider Greeves because it was introduced by Petitioner for the first time at oral hearing, and was not raised in any briefing by the Petitioner. *Emerson Electric Co., v. SIPCO, LLC*, Case IPR2017-001973, slip. op. at 9 (PTAB Mar. 27, 2017) (Paper 25). The circumstances in this proceeding are distinguishable in that Greeves was properly raised in the Reply.

Therapeutic Prods Ltd. P'ship v. Biomarin Pharm. Inc., 825 F.3d 1360, 1365–69 (Fed. Cir. 2016). "The critical question for compliance with the APA [Administrative Procedure Act] and due process is whether [Patent Owner] received 'adequate notice of the issues that would be considered, and ultimately resolved.'" *Id.* at 1367 (citation omitted). As to that question, Patent Owner was not denied notice or a meaningful opportunity to be heard during the proceeding.

First, we are not changing theories or relying on a ground that is different from the one upon which *inter partes* review was instituted, namely obviousness over Kahn in view of the APA. We are not combining Greeves with Kahn and the APA, but rather are considering Greeves for the limited purpose of assessing the background knowledge of a person of ordinary skill in the art, and in particular, whether Greeves corroborates Petitioner's arguments made at the petition stage about the prior art. Pet. 17–18; Ex. 1018 ¶¶ 41–42.

Second, Patent Owner had the opportunity at the oral hearing to address Greeves. Indeed, the panel asked Patent Owner about Greeves during the hearing, including whether Greeves should be considered for the purpose of assessing the level of skill in the art. Tr. 69:5–74:8. In addition, if Patent Owner had wanted the Board to disregard Greeves for the purpose for which Petitioner relies on it, Patent Owner could have filed a motion to exclude its use for that purpose. *See* 37 C.F.R. § 42.64(c); *see also Genzyme*, 825 F.3d at 1368. Also, Patent Owner could have asked to file a surreply to address Greeves. *See Genzyme*, 825 F.3d at 1368. Patent Owner failed to take advantage of its procedural options to seek to exclude Greeves or to respond to Petitioner's arguments.

Our reviewing court noted, in *Genzyme*, that "[t]here is no requirement, either in the Board's regulations, in the APA, or as a matter of due process, for the institution decision to anticipate and set forth every legal or factual issue that might arise in the course of trial," and "[t]he purpose of the trial in an *inter partes* review proceeding is to give the parties an opportunity to build a record by introducing evidence—not simply to weigh evidence of which the Board is already aware." *Id.* at 1366–1367.

Accordingly, we may properly consider Greeves for the limited purpose of determining the background level knowledge of a person of ordinary skill in the art at the time of alleged invention.

Patent Owner proffers additional arguments in support of its contention that Petitioner has not established that a person of ordinary skill in the art would have been motivated to combine Kahn with the alleged APA to arrive at a transceiver that is "electrically interfaced with a sensor."

First, Patent Owner argues that Petitioner has not demonstrated that a skilled artisan would have achieved the claimed invention with a reasonable expectation of success. *Id.* Specifically, according to Patent Owner, Petitioner and its expert failed to consider numerous factors that would have dissuaded a skilled artisan from converting the network of sensors described in the APA into a wireless network. *Id.* These alleged factors include delay, interference, and security. *Id.* In support of its argument, Patent Owner relies on journal articles, namely Exhibits 2003, 2006, and 2008. *Id.* at 44–49. In particular, Patent Owner criticizes Petitioner's expert for not considering these journal articles in forming his opinion. *Id.* Patent Owner's argument is unpersuasive, because the journal articles are dated long after the alleged 1999 invention date, and have no bearing on sensors

and actuators and whether a skilled artisan would have known how to interface commonplace sensors and actuators with standard transceivers in Kahn's PR network at the time of invention. *See generally* Exs. 2003, 2006, 2008. The cited journal articles do not describe sensors or actuators (and how to interface them with wireless transceivers), but rather they relate to computer networks in general. *See generally* Exs. 2003, 2006, 2008. One article, dated 2014, relates to security and generally describes cyberwar, stating that cyberspace is a fifth domain of war, and discloses various definitions of "cyberwar" proffered by organizations such as NATO and the Geneva Center for the Democratic Control of Armed Forces. Ex. 2008, 14–21. The other two cited journal articles, dated 2006 and 2009, generally describe Wi-fi networks implementing IEEE 802.11 standards. *See generally* Exs. 2006, 2008. These articles relate to capacity problems in high data volume deployments. *Id.* We do not find credible Patent Owner's argument that, in light of these journal articles, a skilled artisan "would not have had a reasonable expectation of success of achieving the claimed invention without undue experimentation." PO Resp. 47. Therefore, the fact that Petitioner's expert did not consider these journal articles in forming his opinion does not persuade us of a different result. As we discussed above, we find credible Dr. Heppe's opinion that a skilled artisan would have known how to interface the prior art sensors with radio transceivers such as those described in Kahn without undue experimentation because the sensors described in the APA were commonplace parts intended for third parties to integrate into their systems, and therefore the sensors used interfaces having well-defined behavior described in specifications that would have been easy to integrate with radio transceivers. Ex. 1018 ¶ 42.

Patent Owner's evidence and arguments regarding the cited journal articles do not persuade us otherwise.

Patent Owner also argues that Petitioner's alleged motivation to combine is unsupported by the record of evidence (PO Resp. 58–60), and more specifically, that Petitioner's alleged motivation to combine based on the following factors is not supported by the record evidence: local distribution of information (PO Resp. 58–60); rapid deployment (PO Resp. 60–61); configurability and flexibility (PO Resp. 61–62); self-initializing and self-organizing (PO Resp. 62); and cost savings (PO Resp. 63–65).

With respect to Patent Owner's arguments relating to local distribution of information, Patent Owner acknowledges that both Kahn and the APA describe local distribution of information. PO Resp. 58–60. Patent Owner argues that this fact cuts against combining Kahn with the APA because a skilled artisan would have no motivation to alter a system to provide functionality it already possessed. *Id.* at 58. In other words, Patent Owner argues that because both systems provide for local distribution of information, there would be no reason to alter either system. This argument is not credible. Kahn teaches that, in implementations involving local distribution of information, using a wireless PR network can provide increased flexibility in rapid deployment and reconfiguration over using a wired network. Ex. 1015, 1469. Accordingly, Kahn teaches that it would have been advantageous to use a wireless network for locally distributed networks. The APA teaches a locally distributed network that is hard-wired, and that includes sensors and actuators. Ex. 1001, Fig. 1; 5:41–6:3. The modification of Kahn proposed by Petitioner involves adding sensors and

actuators to Kahn's PR network, which does not have sensors and actuators. The fact that both networks, the one described in Kahn and the one described in the APA, involve local distribution of information suggests an advantage to implementing a network of sensors and actuators wirelessly, namely to increase flexibility in rapid deployment and reconfiguration.

With respect to Patent Owner's arguments relating to rapid deployment, configurability, and flexibility, Patent Owner argues that "there is no evidence that these features would have been better achieved by the APA in a wireless network." PO Resp. 61–62. Patent Owner relies on its experts' testimony that wired networks have the same reachability and connectivity as wired networks. *Id.* (citing Ex. 2026 ¶ 112). We do not find this credible because Kahn discloses that PR networks permit mobile communications and flexibility in rapid deployment and reconfiguration over fixed installations. Ex. 1015, 1469, col. 1. We do not find it credible that wired networks, with fixed wires and cables to connect devices, had the same degree of flexibility in rapid deployment and reconfiguration as a wireless (mobile) network that is not limited to using already-installed, fixed wires and cables.

With respect to Patent Owner's argument that Kahn does not provide cost savings as a motivation to combine, this argument does not persuade us of a different result because our Decision relies on Petitioner's argument that the APA, rather than Kahn, provides costs savings as a benefit of wireless networks.

With respect to Patent Owner's arguments regarding self-initiating and self-organizing, these arguments do not persuade us of a different result

because our Decision does not depend on Petitioner's arguments in that regard.

As to claim 1's recitation that the transceiver be "configured to receive select information and identification information transmitted from a second wireless transceiver," Petitioner relies on Kahn's teaching of a second transceiver receiving payload data (i.e., text) and a unique identifier (i.e., selector), respectively, from a first transceiver. Pet. 36. We are persuaded by Petitioner's arguments and evidence that the payload data received by the transceiver in Kahn is "select information," as recited in claim 1, and that the selector received by Kahn's transceiver is "identification information," as recited in claim 1, because the selector identifies the second transceiver. Patent Owner does not dispute that Kahn teaches this limitation.

Petitioner argues that the information received by the second transceiver in Kahn is of a "predetermined signal type," as recited in claim 1, because it consists of a "48 bit preamble followed by a variable length header," "followed by the text and a 332 bit checksum." *Id.* (quoting Ex. 1015, 1478). We are persuaded by Petitioner's arguments and evidence that information received by the second transceiver in Kahn is of a "predetermined signal type," as recited in claim 1, because it is a signal that follows a pre-determined format. Patent Owner does not dispute that Kahn teaches this limitation.

With respect to claim 1's recitation of "the transceiver being further configured to wirelessly retransmit in the predetermined signal type the select information, the identification information associated with the second wireless transceiver, and transceiver identification information associated

with the transceiver making retransmission," Petitioner argues that Kahn teaches that during retransmission, Kahn's packet radio transceiver transmits its own selector along with the selector of the transceiver from which it originally received the transmission and text using a predetermined format. Pet. 37–38. We are persuaded by Petitioner's arguments and evidence that Kahn's retransmission by a transceiver, using a predetermined signal format, of its own selector and the selector from which it received the transmission, teaches this claim limitation. Patent Owner does not dispute that Kahn teaches this limitation.

With respect to claim 1's recitation of "a controller operatively coupled to the transceiver and the sensor, the controller configured to control the transceiver and receive data from the sensor, the controller configured to format a data packet for transmission via the transceiver, the data packet comprising data representative of data sensed with the sensor," Petitioner relies on Kahn's teaching of a microprocessor controller. *Id.* at 37. Petitioner argues that the controller in Kahn controls the transceiver because it selects the transmit frequency, data rate, power, and time of transmission for the transceiver. *Id.* Petitioner further argues that data from the APA sensors would have been received by Kahn's controller, and that Kahn's controller would have assembled the data into packets for transmission by the transceiver. *Id.*

Patent Owner does not dispute that Kahn teaches a controller operatively coupled to a transceiver, the controller configured to control the transceiver and receive data, the controller configured to format a data packet for transmission via the transceiver. Rather, Patent Owner argues that Petitioner has not demonstrated a motivation to modify Kahn in view of

the APA to include a sensor. PO Resp. 43–65. However, we discussed these arguments above. For reasons we discussed above, we are persuaded by Petitioner's arguments, and Patent Owner's arguments do not persuade us otherwise.

Dependent claims 2 and 7 further recite, in pertinent part, actuators for implementing commands. Petitioner cites to the actuator described in the APA as teaching this limitation. Pet. 40. Petitioner explains that the APA includes local controller 110 that "returns control signals . . . to the system actuators." *Id.* (citing Ex. 1001, 5:46–50). Petitioner argues that a person of ordinary skill in the art would have substituted Kahn's microprocessor controller for the APA's local controller 110, and coupled the controller to sensors and actuators as described in the APA. Pet. 40. Dr. Heppe opines that a person of ordinary skill in the art would have been motivated to combine the teachings of Kahn and the APA to achieve the claimed limitation for the same reasons discussed with respect to combining the APA's sensors with Kahn's PR network. Ex. 1018 ¶ 76; *see also id.* at ¶ 42 (discussing motivation to combine Kahn and the APA). Patent Owner does not introduce any arguments specific to claims 2 and 7, but rather provides general arguments regarding motivation to combine Kahn and the APA, which we discussed above. On this record, however, for reasons we discussed above with respect to the combination of the APA's sensors and actuators with Kahn's PR network, we are persuaded by Petitioner's arguments.

Upon review of the record in this proceeding, we determine that Petitioner has demonstrated by a preponderance of the evidence that claims 1, 2, and 7 of the '780 patent are unpatentable under § 103 as obvious

over Kahn in view of the APA.

H. Asserted Obviousness of Claims 4–6 and 8 over Kahn in view of the APA and Burchfiel

Petitioner contends that claims 4–6 and 8 of the ’780 patent are unpatentable as obvious over Kahn in view of the APA and Burchfiel. Pet. 41–44. Petitioner proffers a declaration and supplemental declaration of Dr. Heppe to support its contentions. Exs. 1018, 1041. Patent Owner disputes Petitioner’s contentions, arguing that the claims would not have been obvious. PO Resp. 34–43. Patent Owner proffers two declarations of Dr. Almeroth to support its assertions. Exs. 2001, 2026. We have reviewed the record, and we determine that Petitioner has shown by a preponderance of the evidence that claims 4, 6, and 8 of the ’780 patent are unpatentable as obvious over Kahn in view of the APA and Burchfiel. We determine that Petitioner has not made a sufficient showing with respect to claim 5.

1. *Overview of Burchfiel*

Burchfiel is an article published as part of the American Federation of Information Processing Societies National Computer Conference Proceedings, and is dated 1975. Ex. 1016. Petitioner asserts that Burchfiel qualifies as prior art under 35 U.S.C. §§ 102(a) and 102(b). Pet. 18. Patent Owner does not dispute Petitioner’s assertion. For purposes of this decision, we are satisfied that Burchfiel qualifies as prior art under 35 U.S.C. §§ 102(a) and 102(b). Burchfiel is titled “Functions and structure of a packet radio station,” shares a common author with Kahn, and like Kahn, describes PR networks. Burchfiel describes the same PR network described in Kahn, but provides additional details relating to various functions of a packet radio station. *See generally* Exs. 1016, 1015.

2. *Analysis*

Claims 4–6 further recite, in pertinent part, that the data packets comprise "a function code" and the claimed device implements the function code, or a memory to store one or more "function codes." Petitioner relies on Burchfiel's discussion of function fields to teach the claimed function codes. Pet. 41–44; Ex. 1018 ¶¶ 77–78. As we noted above, both Kahn and Burchfiel describe PR networks. *See generally* Exs. 1016, 1015. Kahn cites to Burchfiel in its description about functions of a station in PR networks. Ex. 1015, 1477. Burchfiel provides additional information about the functions of stations in PR networks. *See generally* Ex. 1016. Accordingly, we are persuaded that a person of ordinary skill in the art would have looked to Burchfiel for further description of the functions described in Kahn. Patent Owner does not argue otherwise.

a. Claims 4 and 6

Claim 4 recites the device of claim 1 "wherein the controller is configured to receive data packets comprising a function code, and in response to the function code, implement a function." Petitioner argues that Burchfiel teaches that the data controller in Kahn's packet radios receives packets that include a function code in a function field, and implements a process (control, debugging, or measurement) in response to the function code. Pet. 41–42. In particular, Burchfiel describes the radios as performing control functions such as "[e]stablishing control, debugging, and measur[ing] connections from the station to each repeater that it controls." Ex. 1016, 247. These functions are indicated by a "function field" located in a packet. *Id.* "The 'function field' provides an address: within a [packet radio], it selects the control process, the debugging process, or the

measurement process." *Id.*; *see id.* at Fig. 3 (depicting the protocol for a packet radio network including a "function" field in the protocol). We agree with Petitioner, and Patent Owner does not dispute, that Burchfiel discloses the PR network controller receiving data packets comprising a function field, and in response to the field, implementing a process. However, Patent Owner disputes that the function field disclosed in Burchfiel is a "function code" and that "implementing a process" in Burchfiel is the same as "implementing a function." PO Resp. 34–36.

Claim 6 recites the device of claim 1 "further comprising a memory to store one or more function codes corresponding to the device, the function codes corresponding to a number of functions the controller can implement." Petitioner relies on Kahn's disclosure that the digital section of Kahn's radio includes memory for buffering packets and storing software for use by Kahn's controller. Pet. 43–44 (citing Ex. 1015, 1477, col. 2). Petitioner argues that a person of ordinary skill in the art would have understood that the memory disclosed in Kahn also stored the function fields (described in Burchfiel) used by the controller in Kahn in order to generate packets for transmission. *Id.* at 44 (citing Ex. 1018 ¶¶ 82–84). Petitioner argues that the function field corresponds to a number of functions the controller can implement, namely the function field corresponds to a process (control, debugging, or measurement). *Id.* (citing Ex. 1016, 247, col. 1). We agree with Petitioner, and Patent Owner does not dispute, that the combination of Kahn and Burchfiel teaches a memory to store a function field corresponding to the packet radio, the function fields corresponding to a number of processes the controller can implement. However, Patent Owner disputes that the function field disclosed in Burchfiel is a "function code"

and that "implementing a process" in Burchfiel is the same as "implementing a function." PO Resp. 36–38. Patent Owner also contends that Petitioner and Dr. Heppe have failed to explain why a skilled artisan would have been motivated to store function *codes* in Kahn's radio or modify Kahn's radio to transmit function *codes*, but Patent Owner does not dispute Petitioner's contentions that the combination of Kahn and Burchfield teaches storing function *fields* and transmitting function *fields*. *Id.*

Accordingly, the issues before us are whether the "function field" disclosed in Burchfiel is a "function code" as recited in claims 4 and 6, and whether Burchfiel's disclosure of implementing a process is the same as "implement[ing] a function" as recited in claims 4 and 6.

With respect to the limitation "function code," because we have construed this term to mean "bits of data corresponding to a function," we are persuaded that the function field disclosed in Burchfiel is a function code because the address in the function field comprises bits of data, and it corresponds to a process (e.g., a function), namely a control process, debugging process, or measurement process, because when a packet radio unit ("PRU") receives the address in the function field, the PRU selects the process corresponding to the address. Reply 20; Ex. 1016, 247, col. 1. Patent Owner's arguments that Burchfiel does not disclose a function code are based on its construction of "function code" to mean "a symbol representing a function of the output of a function" and its construction of "function" to mean "a relation from a domain to a codomain in which exactly one member of the codomain is assigned to each member of the domain," both of which we have rejected. PO Resp. 34–36.

With respect to the limitation "implementing a function," because we have construed "function" to encompass "features" or "parameters" of a system, and "capabilities" and "tasks to be performed," we are persuaded the processes disclosed in Burchfiel are functions because the processes are tasks to be performed. Burchfiel describes "control functions performed" by a station that includes initialization of the packet radio network, which involves tasks or functions such as establishing control, debugging, and measurement connections from a station to various repeaters. Ex. 1016, 247. Patent Owner's arguments that Burchfiel does not disclose "implementing a function" are based on Patent Owner's construction of "function" to mean "a relation from a domain to a codomain in which exactly one member of the codomain is assigned to each member of the domain," which we have rejected. PO Resp. 36–38.

Accordingly, Petitioner has persuaded us that Kahn, in view of the APA and Burchfiel, renders obvious claims 4 and 6.

b. Claim 5

Claim 5 recites the device of claim 1 "wherein the controller is configured to format data packets for transmission via the transceiver, the data packets comprising a function code corresponding to sensed data and the unique identification code that identifies the transceiver." Petitioner relies on Kahn's disclosure that the controller is configured to format data packets for transmission via a transceiver. Pet. 42 (citing Ex. 1015, 1477, col. 2). Petitioner relies on Burchfiel and Kahn for teaching that the data packets include a function code corresponding to sensed data in the form of

keyboard strokes entered on a keyboard. *Id.*[10] However, the "sensed data" in claim 5 refers to data sensed in claim 1 by a sensor that is electrically interfaced with a transceiver. Petitioner has not demonstrated that the keyboard it alleges to be present would have been electrically interfaced with the transceiver of the packet radio, as required by claim 1, from which claim 5 depends. At best, Petitioner has shown that a keyboard would have been interfaced with a computer terminal that is, in turn, connected to a packet radio. Accordingly, Petitioner has not persuaded us that Kahn, in view of the APA and Burchfiel, teaches a "function code corresponding to sensed data," as recited in claim 5.

c. Claim 8

With respect to claim 8 of the '780 patent, which depends from claim 1 and further recites that "the second transceiver is nearby to the transceiver," Petitioner asserts Kahn teaches this recitation, and alternatively, so does Burchfiel. Pet. 44. Petitioner relies on Kahn's description of "nearby" radios, "closely spaced" radios, transceivers in "local distribution," radios close enough to have a "radio line-of-sight path," a radio reporting "neighbors," which it can "hear," and radios close enough to be in "line of sight propagation range." *Id.* (citing Exs. 1015, 1469, 1471, 1477, 1481). In the alternative, Petitioner relies on Burchfiel's description of "next transceivers" that are "within earshot" and discloses transceivers

[10] In the Petition, Petitioner does not identify a keyboard as satisfying the claimed sensor limitation in its discussion of claim 1, from which claim 5 depends. Pet. 34–36. Petitioner's expert, Dr. Heppe, discusses a keyboard in connection with the sensor limitation (Ex. 1018 ¶ 60), but the Petition limits its discussion with respect to claim 1 to a "microphone or similar transducer that senses acoustic signals" (Pet. 35–36).

speaking to "local" repeaters and to a "nearest" station. Pet. 44 (citing Ex. 1016, 247, 250). Patent Owner does not dispute that Kahn, or alternatively Burchfiel, teaches this limitation. We are persuaded for purposes of this decision that the recitation of claim 8 is taught by Kahn, or alternatively by Burchfiel.

Upon review of the record in this proceeding, we determine that Petitioner has demonstrated by a preponderance of the evidence that claims 4, 6, and 8 of the '780 patent are unpatentable under § 103 as obvious over Kahn in view of the APA and Burchfiel. However, Petitioner has not demonstrated by a preponderance of the evidence that claim 5 of the '780 patent is unpatentable under § 103 as obvious over Kahn in view of the APA and Burchfiel.

III. SUMMARY

For the foregoing reasons, we determine that Petitioner has demonstrated, by a preponderance of the evidence, that claims 1–15 of the '780 patent are unpatentable under 35 U.S.C. § 103(a) over the '732 patent, claims 1, 2, and 7 of the '780 patent are unpatentable under 35 U.S.C. § 103(a) over Kahn in view of the APA, and claims 4, 6, and 8 of the '780 patent are unpatentable under 35 U.S.C. § 103(a) over Kahn in view of the APA and Burchfiel. We further determine that Petitioner has not shown that claim 5 of the '780 patent is unpatentable under 35 U.S.C. § 103(a) over Kahn in view of the APA and Burchfiel.

IV. ORDER

Accordingly, it is:

ORDERED that claims 1–15 of the '780 patent have been shown to be unpatentable;

FURTHER ORDERED that our previous Order "that Patent Owner shall not file any papers . . . with respect to [the '780 patent] without the Board's prior authorization, except for papers filed directly with the Board in [this proceeding] that do not otherwise require prior Board authorization" (Paper 10) is hereby lifted; and

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

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