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Paper 39
Date: January 26, 2021

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

RESIDEO TECHNOLOGIES, INC. and
CENTRAL SECURITY GROUP – NATIONWIDE, INC.,[1]
Petitioner,

v.

UBIQUITOUS CONNECTIVITY, LP,
Patent Owner.

IPR2019-01336
Patent 9,602,655 B2

Before JEAN R. HOMERE, JOHN F. HORVATH, and
MELISSA A. HAAPALA, *Administrative Patent Judges.*

HORVATH, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining Some Challenged Claims Unpatentable
35 U.S.C. § 318(a)

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[1] Central Security Group – Nationwide, Inc., who filed a petition in IPR2019-01610, has been joined as a petitioner to this proceeding.

I. INTRODUCTION

A. Background and Summary

Resideo Technologies, Inc. ("Resideo") filed a Petition requesting *inter partes* review of claims 1–24 ("the challenged claims") of U.S. Patent No. 9,602,655 B2 (Ex. 1001, "the '655 patent"). Paper 2 ("Pet."), 3–4. Ubiquitous Connectivity, LP ("Patent Owner") filed a Preliminary Response. Paper 6 ("Prelim. Resp."). Upon consideration of the Petition and Preliminary Response, we instituted *inter partes* review of all challenged claims on all grounds raised in the Petition. Paper 7 ("Dec. Inst."). Subsequent to our Institution Decision, Central Security Group – Nationwide, Inc. ("CSG") was joined with Resideo as Petitioner in this proceeding. Paper 10.

Patent Owner filed a Response to the Petition (Paper 23, "PO Resp."), Petitioner filed a Reply (Paper 27, "Pet. Reply"), and Patent Owner filed a Sur-Reply (Paper 29, "PO Sur-Reply"). An oral hearing was held on October 27, 2020, and the hearing transcript is included in the record. Paper 37 ("Tr.").

We have jurisdiction under 35 U.S.C. §§ 6, 318. This is a Final Written Decision under 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons set forth below, we find Petitioner has shown by a preponderance of evidence that claims 1, 3–8, 10, and 12–24 are unpatentable, but has failed to show by a preponderance of evidence that claim 2, 9, and 11 are unpatentable.

B. Real Parties-in-Interest

Resideo identifies itself, the City of San Antonio, Texas, the City Public Service Board of San Antonio, Texas d/b/a CPS Energy, Ademco,

Inc., and Honeywell International, Inc. as real parties-in-interest.[2] Pet. 1. CSG identifies itself and Guardian Security Systems, Inc., CSG Holdco, Inc., Central Security Group Holdings, Inc., Central Security Group Holdco, Inc., and Central Security Group, Inc. as real parties-in-interest. Paper 10, 2. Patent Owner identifies itself as the real party-in-interest. Paper 3, 2.

C. Related Matters

The parties identify *Ubiquitous Connectivity, LP v. City of San Antonio d/b/a CPS Energy*, 5:18-cv-00718 (W.D. Tex.), *Ubiquitous Connectivity, LP v. TXU Energy Retail Co. LLC*, 3:18-cv-02084 (N.D. Tex.), *Ubiquitous Connectivity, LP v. Central Security Group – Nationwide, Inc.*, 4:18-cv-00368 (N.D. Okla.), and *Ubiquitous Connectivity, LP v. TXU Energy Retail Co. LLC*, 6:17-cv-00433 (E.D. Tex.) as district court proceedings that can affect or be affected by this proceeding. Pet. 1; Paper 3, 2; Paper 10, 2–3. The parties also identify IPR2019-01335, challenging related U.S. Patent No. 8,064,935 B2, as an *inter partes* review that can affect or be affected by this proceeding. Pet. 1; Paper 3, 2; Paper 10, 2–3. Patent Owner further identifies Application No. 16/503,883 as a pending application that can affect or be affected by this proceeding. Paper 3, 3.

D. The '655 Patent

The '655 patent relates to "a remote monitoring and control system for an environment." Ex. 1001, 1:22–23. Such a system is shown in Figure 1 of the '655 patent, which is reproduced below.

[2] Honeywell disputes its identification as a real party-in-interest. Pet. 1, n.1.

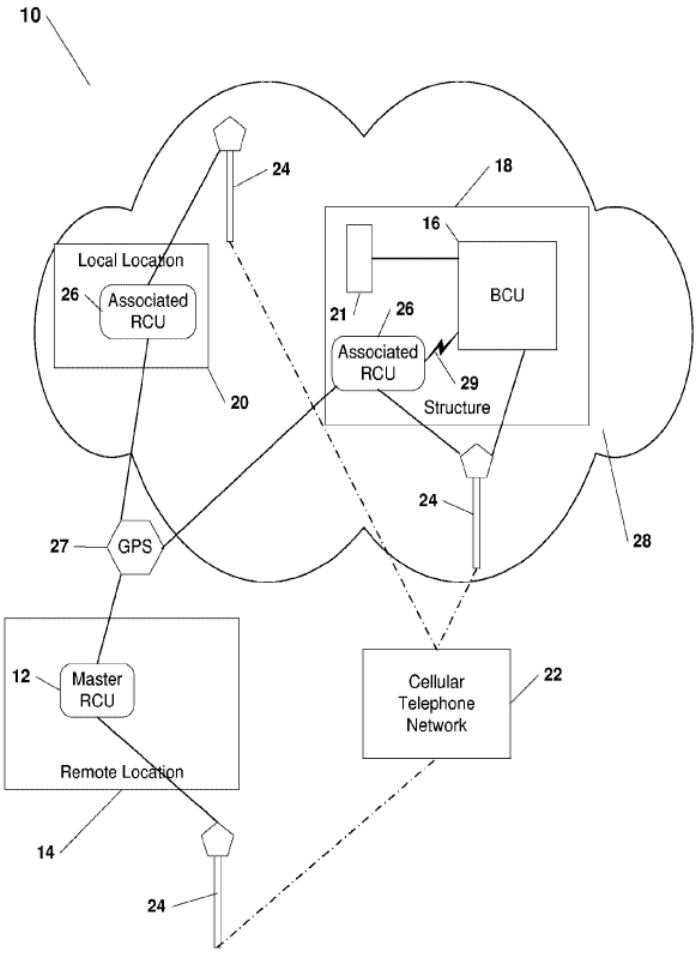

Figure 1 is a block diagram illustrating an environmental connectivity and control system. *Id.* at 3:43–45. The system includes base control unit 16, environmental devices 21, master remote control unit 12, associated remote control units 26, and cellular telephone network 22. *Id.* at 3:58–67, Fig. 1. Master remote control unit 12 interfaces with base control unit 16 to monitor and control devices 21 via "a short message and/or the data bearer cellular telephone network 22." *Id.* at 3:58–64. Associated remote control units 26 also interface with base control unit 16 to monitor and control devices 21 when in the proximity of base control unit 16. *Id.* at 3:64–67.

Controlled devices 21 may include HVAC (heating, ventilation, and air conditioning) units, refrigerators, water heaters, security systems,

cameras, lights and other devices. *Id.* at 11:46–53, 12:1–6. Environmental conditions monitored by the system may include utility and power status, humidity, door and window condition, temperature, smoke or toxic gas presence, structural and security integrity, and others. *Id.* at 11:50–56, 12:25–30. Base control unit 16 "consists [of] a wireless module 70 communicating with a microcontroller 106 for operating a number of separate subsystems" and "communicates status information to the remote control unit on a periodic or event-driven basis." *Id.* at 4:55–57, 9:15–17. For example, base control unit 16 communicates various alarms to remote control unit 12, such as burglar and fire alarms, or temperature threshold alarms for an HVAC or freezer. *Id.* at 9:20–27.

Remote control unit 12 can be a "conventional cellular telephone handset[] . . . equipped with a programming kernel, such as Java or J2ME." *Id.* at 7:10–16. Remote control unit 12 "communicates with the base control unit 16 to affect the operational aspects thereof and peripheral equipment operatively attached thereto." *Id.* at 6:61–63. Remote control unit 12 executes application software to "communicate[] . . . command[s] to the base control unit 16 through the cellular telephone network 22." *Id.* at 7:2–4. "The data path between the remote control unit and the base control unit is SMS ('simple message service')." *Id.* at 7:22–24. SMS messages are "processed within the cellular telephone's application software" and "by the base control unit applications software." *Id.* at 7:52–54, 11:24–26.

E. Illustrative Claims

Claim 1 of the '655 patent is illustrative of the claimed subject matter, and is reproduced below.

> 1. A base unit configured to communicate with an environmental device and to communicate with a cellular

> remote unit having wireless connectivity capable of communicating from a geographically remote location, the base unit comprising:
>
> a first communication interface configured to receive environmental information from the environmental device and to send a control instruction to the environmental device;
>
> a wireless communication interface configured to send a first message to the cellular remote unit via a cellular communications network and to receive a second message from the cellular remote unit via the cellular communications network,
>
> wherein the first message is a first digital communications message including a representation of the environmental information, and
>
> wherein the second message is a second digital communications message including a command regarding the environmental device; and
>
> a microcontroller configured to process the second message, to provide the control instruction based on the command, and to send the control instruction to the environmental device via the first communication interface, and
>
> wherein the command is for the base unit initiated by a user from the cellular remote unit, and
>
> wherein the control instruction to the environmental device is associated with the command for the base unit,
>
> wherein the cellular remote unit is configured to determine position data of the cellular remote unit, and determine when the cellular remote unit is outside a geo-fence,
>
> wherein the cellular remote unit is configured to transmit a notification via a simple message service responsive to determining that the cellular remote unit is outside of the geo-fence.

Id. at 13:57–14:26. Claim 24 is substantially similar to claim 1, but does not require the cellular remote unit to determine its position, determine when it

is outside a geo-fence, or transmit an SMS notification when it is outside its geo-fence. *Compare id.* at 15:28–16:29, *with id.* at 13:57–14:26. Instead, it requires the wireless communication interface be configured to send a third message to and receive a fourth message from a subordinate remote unit, and requires the microcontroller be configured to process the fourth message and selectively send a second control instruction to the environmental device based on a command in the fourth message. *Id.* Claims 2–23 depend directly or indirectly from claim 1. *Id.* at 14:27–15:27.

F. Evidence[3]

Reference		Effective Date	Exhibit
Oinonen	US 6,275,710 B1	Aug. 14, 2001	1016
Bielski[4]	EP 1391861 A2	Feb. 25, 2004	1017
Chi-Hsiang Wu and Rong-Hong Jan, *System integration of WAP and SMS for home network system*, 42 Computer Networks 493–502 (2003) ("Wu")		July 15, 2003[5]	1018
Coon	US 2002/0147006 A1	Oct. 10, 2002	1019
Ehlers	US 2004/0117330 A1	July 28, 2003[6]	1020
Denis	EP 1289248	Mar. 5, 2003	1021
Lincoln	US 6,108,614	Aug. 22, 2000	1022

[3] Petitioner also relies upon the Declaration of Kevin Jeffay (Ex.1003), Rupert Lee (Ex. 1028), and Sylvia D. Hall-Ellis, Ph.D. (Ex. 1029). Patent Owner relies upon the Declaration of Ivan Zatkovich (Ex. 2002).
[4] Bielski is a certified translation of a European Patent Application originally published in German. *See* Ex. 1017, 20–39.
[5] Petitioner relies upon the Lee and Hall-Ellis Declarations to establish the public availability of Wu on the effective date. *See* Pet. 14–15: Paper 11. Patent Owner does not dispute the public availability of Wu. See PO Resp. 52–65.
[6] Petitioner relies on the filing date of Ehlers to establish its availability as prior art under 35 U.S.C. § 102(e). *See* Pet. 14.

Reference		Effective Date	Exhibit
Whitley	WO 99/49680	Sept. 30, 1999	1023

G. Instituted Grounds

Petitioner asserts the challenged claims would have been unpatentable on the following grounds:

Ground	Claims	35 U.S.C. §	References
1A	1, 4–8, 10, 12–14, 16, 17, 20, 22, 23	103(a)	Oinonen, Whitley, Coon
1B	2, 3, 9, 11, 15, 18, 19, 21	103(a)	Oinonen, Whitley, Coon, Ehlers
1C	24	103(a)	Oinonen, Whitley, Denis
1D	24	103(a)	Oinonen, Whitley, Lincoln
2A	1, 3, 5–8, 10, 12–17, 20–23	103(a)	Bielski, Wu, Coon
2B	2, 9, 11, 18, 19	103(a)	Bielski, Wu, Coon, Ehlers
2C	4	103(a)	Bielski, Wu, Coon, Whitley
2D	24	103(a)	Bielski, Wu, Denis
2E	24	103(a)	Bielski, Wu, Lincoln

II. ANALYSIS

A. Level of Ordinary Skill in the Art

Petitioner's declarant, Dr. Jeffay, identifies a person of skill in the art ("POSITA") as someone with "at least a bachelor's degree in electrical engineering or computer science and at least two years of industry experience in the field of embedded systems and/or process control." Ex. 1003 ¶ 10. Patent Owner proposes a similar definition, namely, a person having "at least a bachelor's degree in electrical engineering or computer science, and at least two years of industry experience in the fields of computers and communications." PO Resp. 4 (citing Ex. 2002 ¶ 29). Patent Owner proposed the same definition pre-institution, and we adopted that

definition in our Institution Decision finding "little difference between [Petitioner's] and Patent Owner's assessment of the level of skill in the art." Dec. Inst. 8–9. Neither party disputes that decision. *See* PO Resp. 4; Pet. Reply. Therefore, we maintain our decision to adopt Patent Owner's definition of the level of skill in the art.

B. Claim Construction

In *inter partes* reviews, a claim is interpreted "using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. 282(b)." 37 C.F.R. § 42.100(b) (2019). Under that standard, the "words of a claim 'are generally given their ordinary and customary meaning.'" *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc) (internal citation omitted). Moreover, the ordinary and customary meaning applies "unless the patentee demonstrated an intent to deviate from [it] . . . by redefining the term or by characterizing the invention in the intrinsic record using words or expressions of manifest exclusion or restriction, representing a clear disavowal of claim scope." *Teleflex, Inc. v. Ficosa N. America Corp.*, 299 F.3d 1313, 1327 (Fed. Cir. 2002); *see also Hill-Rom Servs., Inc. v. Stryker Corp.*, 755 F.3d 1367, 1371 (Fed. Cir. 2014). Thus, although we may "look to the specification and prosecution history to interpret what a patentee meant by a word or phrase in a claim," we may not read "extraneous limitations . . . into the claims from the specification or prosecution history" absent an express definition or clear disavowal of claim scope. *Bayer AG v. Biovail Corp.*, 279 F.3d 1340, 1348 (Fed. Cir. 2002). Only those claim terms in controversy need to be construed, and only to the extent necessary to resolve the controversy. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017).

1. Environmental Device, Base Unit, Cellular/Remote Unit, Communications Interface

Petitioner requests these terms be construed to have their plain and ordinary meaning, and provides express constructions "[i]f necessary." Pet. 7–9. In our Institution Decision, we declined to expressly construe these terms because Patent Owner did not argue they required construction and did not dispute any of Petitioner's conditionally proposed constructions. *See* Dec. Inst. 8–9. Neither party disputes that decision, which we maintain here. *See* PO Resp. 4–22; Pet. Reply 2–12.

2. Simple Message Service, Digital Communications Message

Petitioner argues the term "simple messaging service" should be construed to mean "short message service" or SMS because the '655 patent equates the two terms. Pet. 9–11. Petitioner argues the term "digital communications message" should be construed to mean SMS because "[t]he 655 Patent cannot be read so broadly to cover *any* message capable of digital transmission." *Id.* at 11–12. Patent Owner does not dispute Petitioner's construction of "simple message service," but contends it would "be improper to limit the claim term 'digital communications message' to SMS messages." PO Resp. 4–22; PO Sur-Reply 2.

In our Institution Decision, we construed the term "simple messaging service" to mean "SMS or 'short message service'" because the '655 patent equates the two terms by definition. Dec. Inst. 10–11 (quoting Ex. 1001, 3:8–9, 7:22–24). We also declined to expressly construe the term "digital communications message" because Petitioner's unpatentability contentions rely on exchanging SMS messages and neither party disputes that an SMS

message is a "digital communications message." *Id.* at 11. Neither party disputes our construction of "simple messaging service" or our decision to not expressly construe "digital communications message," both of which we maintain here. *See* PO Resp. 4–22; Pet. Reply 2–12.

3. Microcontroller

Patent Owner argues a "microcontroller" is "a special-purpose computing device including at least a CPU [Central Processing Unit], main memory, timing circuits, and I/O [Input/Output] circuitry designed for a minimal quantity of chips and then programmed to handle a particular task." PO Resp. 12 (citing Ex. 2002 ¶ 48). Patent Owner argues this construction is supported by the Microsoft Computer Dictionary, the Comprehensive Dictionary of Electrical Engineering, and the '655 patent. *Id.* at 7–12.

The Microsoft Computer Dictionary defines the term "microcontroller" to mean:

> A special-purpose, single-chip computer designed and built to handle a particular, narrowly defined task. In addition to the central processing unit (CPU), a microcontroller usually contains its own memory, input/output channels (ports), and timers. When part of a larger piece of equipment, such as a car or a home appliance, a microcontroller is an embedded system.

Ex. 2004, 337. The Comprehensive Dictionary of Electrical Engineering defines the term to mean:

> An integrated circuit chip that is designed primarily for control systems and products. In addition to a CPU, a microcontroller typically includes memory, timing circuits, and I/O circuitry. The reason for this is to permit the realization of a controller with a minimal quantity of chips, thus achieving maximal possible miniaturization. This in turn, will reduce the volume and the cost of the controller. The microcontroller is normally not used for general purpose computation as is a microprocessor.

Ex. 2005, 439.

Patent Owner argues the microcontroller disclosed in the ’655 patent is consistent with these definitions. *See* PO Resp. 10–12 (citing Ex. 1001, 3:50–51, 5:4–8, Fig. 4; Ex. 2002 ¶ 46); PO Sur-Reply 4–8. In particular, Patent Owner argues a person skilled in the art would have understood microcontroller 106 shown in Figure 4 of the ’655 patent is consistent with these definitions because it (1) “includes I/O circuitry components to interact with the subsystems given that no external I/O circuitry is illustrated between the microcontroller and the subsystems,” (2) “works in conjunction with an LCD, keypad, wireless module, and power supply, but . . . does not include separate memory or timing circuits,” and (3) “is specifically designed and then programmed for ‘remote control and remote monitoring of the various subsystems within the residential environment.’” PO Resp. 10–12 (quoting Ex. 1001, 5:4–8, Fig. 4).

Petitioner argues a “microcontroller” is “a microcomputer, microprocessor, or other equipment used for process control, for example, processing a message and sending a command.” Pet. Reply 5–12. Petitioner argues Patent Owner’s proposed construction is too narrow and “finds no support in the specification nor in the claims of the 655 Patent.” *Id.* at 6 (emphasis omitted). For example, Petitioner argues the claims “broadly describe a ‘microcontroller’ that . . . is responsible only for ‘process[ing]’ and send[ing]’” messages and do not describe “any particular components that a microcontroller must comprise.” *Id.* at 6–7. Petitioner further argues the ’655 patent describes a microcontroller as “a component responsible for basic processing” such as “communicating with other components, ‘operating a number of separate subsystems,’ and containing application

software for 'provid[ing] for autonomous control.'" *Id.* at 8 (quoting Ex. 1001, 4:55–61, 10:33–35).

Petitioner also argues that Patent Owner's dictionary definitions have been cherry-picked to support Patent Owner's narrow construction and that other contemporaneous dictionaries define "microcontroller" more broadly. *Id.* at 9. For example, the Dictionary of Electrical and Computer Engineering defines "microcontroller" to mean:

> A microcomputer, microprocessor, or other equipment used for precise process control in data handling, communication, and manufacturing.

Ex. 1039, 14. Petitioner argues "[t]his definition makes clear that a 'microcontroller' is a device that 'controls' and can be a microprocessor . . . programmed for a particular process." Pet. Reply 9.

In rebuttal, Patent Owner argues Petitioner's expert, Dr. Jeffay, "contrasted microcontrollers from microprocessors, saying that a microprocessor only becomes a computer (and therefore a microcontroller) when associated with memory and I/O circuitry," and that a "microcontroller is more of a system . . . whereas the microprocessor would be just a component of the system." PO Sur-Reply 7 (citing/quoting Ex. 2013, 55:9–56:14, 68:3–18).

Upon consideration of all of the evidence and argument presented by Petitioner and Patent Owner, we construe the term "microcontroller" to mean "a microcomputer, microprocessor, or other equipment used for process control." The '655 patent does not define "microcontroller" and neither the '655 patent nor its prosecution history contain statements that limit or disclaim any part of its plain and ordinary meaning. *See Teleflex*, 299 F.3d at 1327 ("[C]laim terms take on their ordinary and accustomed

meanings unless the patentee demonstrated an intent to deviate from [that] meaning . . . by redefining the term or by characterizing the invention in the intrinsic record using words or expressions of manifest exclusion or restriction, representing a clear disavowal of claim scope.”).

The dictionary definitions provided by the parties are consistent insofar as they all require a “microcontroller” to include a central processing unit (CPU) that has been programmed to perform a control function. For example, the Dictionary of Electrical and Computer Engineering defines a “microcontroller” as a “microcomputer, microprocessor or other equipment used for precise process control,” where a “microcomputer” is a digital computer whose CPU is “a microprocessor.” Ex. 1039, 14. Likewise, the Microsoft Computer Dictionary defines a “microcontroller” as “[a] special-purpose, single-chip computer designed . . . to handle a particular . . . task.” Ex. 2004, 337. Although the definition indicates “a microcontroller *usually* contains its own memory, input/output channels (ports), and timers,” it does not *require* the microcontroller to contain anything more than a CPU. *Id.* (emphasis added). Similarly, the Comprehensive Dictionary of Electrical Engineering defines a “microcontroller” as “an integrated circuit chip that is designed primarily for control systems and products.” Ex. 2005, 439. Although the definition indicates “a microcontroller *typically* includes memory, timing circuits, and I/O circuitry,” it does not *require* the microcontroller to contain anything more than a CPU. *Id.* (emphasis added).

For the reasons discussed above, we construe “microcontroller” to mean “a microcomputer, microprocessor, or other equipment used for process control.”

4. Transmit a Notification

Claim 1 recites "the cellular remote unit is configured to transmit a notification via a simple message service responsive to determining that the cellular remote unit is outside of the geo-fence." Ex. 1001, 14:23–26 (the "transmit a notification" limitation). Patent Owner proposes we construe this limitation to mean "the cellular remote unit is configured to determine that the cellular remote unit is outside of the geo-fence and to report this information via a simple message service." PO Resp. 15.

Patent Owner argues its proposed construction is supported by the Specification, which states "[w]hen the remote control unit travels a distance that exceeds the programmed distance from the base control unit, the remote control unit reports this information to the base control unit." *Id.* (quoting Ex. 1001, 9:6–9). Patent Owner also argues its construction is supported by the prosecution history because during prosecution pending claim 38, which recited the base unit received a command from the remote unit when the remote unit determined it was within a geo-fence, was rejected for lack of written description. *Id.* at 16–17. Patent Owner argues the Examiner found the Specification "did <u>not</u> disclose . . . sending a *command* in response to crossing a geo-fence" but instead disclosed sending "*information . . . that [the remote unit] has travelled a distance that exceeds a programmed distance from the base control unit.*" *Id.* (quoting Ex. 1002, 476[7]). Patent Owner argues the Examiner's rejection recognized that "the remote unit *report[ing]* when it crosses the geo-fence . . . represents fundamentally different functionality than sending a *command*." *Id.* at 18.

[7] We cite to page 476 of Exhibit 1002, which is page 11 of an Office Action sent on February 22, 2016. Patent Owner cites to page 11 of the Office Action.

Petitioner argues we should reject Patent Owner's proposed construction "because it continues to recite 'simple message service'" rather than "short message service." Pet. Reply 4–5. Petitioner further argues "the Coon reference discloses the relevant limitation" even under Patent Owner's proposed construction. *Id.* at 5.

In our Institution Decision, we did not expressly construe the "transmit a notification" limitation. We did, however, make a preliminary finding that "nothing in claim 1 precludes the notification message from including a command message." Dec. Inst. 28. Patent Owner's proposed construction is an invitation to construe the "transmit a notification" limitation in a manner that would exclude transmitting a command. We decline to do so for the reasons that follow.

To construe the "transmit a notification" limitation we first "look to the words of the claims themselves." *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996). Claim 1 requires the cellular remote unit to "determine when [it] is outside a geo-fence," and responsive to making that determination, "to transmit a notification via a simple message service." Ex. 1001, 14:22–26. Nothing in claim 1 specifies the type or content of the notification that is to be transmitted when the remote unit determines it is outside the geo-fence. Moreover, nothing in claim 1 prohibits the notification from being a command or requires the notification to report that the remote unit is outside the geo-fence.

Having found claim 1 itself does not limit the "transmit a notification" limitation in the manner proposed by Patent Owner, we review the Specification. *See Phillips*, 415 F.3d at 1313 (a disputed term is read "in the context of the entire patent, including the specification"); *see also Vitronics*, 90 F.3d at 1582 (the Specification "is the single best guide to the meaning of

a disputed term"). The Specification may limit the plain and ordinary meaning of a claim term when it defines the term or uses it in a manner that clearly disavows claim scope. *See Poly-America, L.P. v. API Indus., Inc.*, 839 F.3d 1131, 1136 (Fed. Cir. 2016) ("We depart from the plain and ordinary meaning in only two instances. The first is when a patentee acts as his own lexicographer. The second is when the patentee disavows the full scope of the claim term.") (internal citations omitted). "[T]he standard for [claim] disavowal is exacting, requiring clear and unequivocal evidence that the claimed invention includes or does not include a particular feature." *Id.*

The Specification neither defines the term "transmit a notification" nor uses the term when describing the communications between the remote unit and the base unit when the remote unit determines it is outside a geo-fence. *See* Ex. 1001, 8:37–9:14. The Specification does provide "an *example* of geo-fencing" in which the remote unit, upon determining it is outside a geo-fence, "*reports this information* to the base control unit." *Id.* at 9:6–14 (emphases added). However, the message transmitted in this *example* may not be read from the Specification into the claim. *See Bayer AG*, 279 F.3d at 1348 ("[A] court may not read into a claim a limitation from a preferred embodiment, if that limitation is not present in the claim itself."). This is especially true in this instance because the Specification discloses other messages the remote unit can transmit to the base unit when it determines it has crossed a geo-fence, including "a status message to the base control unit if [it] exceed[s] a programmed set of boundary conditions." Ex. 1001, 8:62–65. An example of a remote unit "status message" is a message that the remote unit is "inactive." *Id.* at 7:30–37. More generally, the Specification describes geo-fencing as a method that "allows the base control unit to change its operational characteristics based upon the location

of the remote control unit(s)." *Id.* at 8:42–44. Such changes can occur when a remote control unit "communicates with the base control unit 16 to affect the operational aspects thereof," e.g., when the remote unit "command[s] the base control unit" by "communicat[ing] the command . . . through the cellular telephone network 22." *Id.* at 6:61–7:5. Thus, the Specification discloses that when a remote unit determines it has crossed a geo-fence, it can transmit different "notifications" to the base unit, including "notifications" that (a) report crossing the geo-fence, (b) send a status message, or (c) send a command.

Having found that neither claim 1 nor the Specification limits the "transmit a notification" limitation in the manner proposed by Patent Owner, we consider the prosecution history. *See Phillips*, 415 F.3d at 1317 ("the prosecution history can often inform the meaning of the claim language by demonstrating how the inventor understood the invention and whether the inventor limited the invention in the course of prosecution"). Patent Owner argues the prosecution history limits the scope of the "transmit a notification" limitation because the Examiner rejected pending claim 38 (receiving a command), but not pending claim 39 (transmit a notification), for lack of written description. *See* PO Resp. 16–19. We are not persuaded by this argument for the following reasons.

First, the Examiner's rejection of pending claim 38 and the Applicant's amendment of that claim did not narrow the scope of pending claim 39. Pending claims 38 and 39, when first presented for examination, read as follows:

> 38. (New) The base unit of claim 8, wherein the remote control unit is configured to determine position data of the remote control unit, and determine when the remote control unit is *within a geo-fence*, wherein the *command is received* from the

> cellular remote [control] unit responsive to determining that the remote control unit is *within the geofence*.
>
> 39. (New) The base unit of claim 8, wherein the remote control unit is configured to determine position data of the remote control unit, and determine when the remote control unit is *outside a geo-fence*, wherein the remote control unit is configured to *transmit a notification* via a simple message service responsive to determining that the remote control unit is *outside the geofence*.

Ex. 1002, 433 (emphases added). The claims differ in two ways, namely, in *what* the remote unit is configured to do and *when* it is configured to do it. Claim 38 implicitly requires a remote unit that can *transmit a command*, i.e., a command that is received by the base unit when the remote unit is *within* a geo-fence. Claim 39 requires a remote unit that can *transmit a notification* to the base unit when the remote unit is *outside* the geo-fence. Logically, the Examiner's understanding of *what* the remote unit can transmit when it is *within the geo-fence* has no bearing on the Examiner's understanding of *what* the remote unit can transmit when it is *outside the geo-fence*. Thus, even if the Applicant's amendment of pending claim 38 disavowed claim scope, which we disagree with for the reasons discussed below, the disavowal pertains to what the remote unit can transmit when it determines it is *within the geo-fence*, not what it can transmit when it determines it is *outside the geo-fence*.

Second, the Applicant's amendment of claim 38 neither reflected the Applicant's understanding of the invention nor disavowed *what* the remote unit can transmit, even when it is inside the geo-fence. The amendment did not reflect the Applicant's understanding of the invention because it was made "[t]o expedite prosecution and without conceding to the Examiner's positions." Ex. 1002, 510. The amendment did not disavow *what* the

remote unit can transmit because it deleted the entire receiving clause rather than limiting what could be received and, therefore, transmitted. *Id.* at 506. Thus, the amendment obviated the written description rejection rather than disavowing the scope of *what* the remote unit could transmit to the base unit.

Accordingly, for the reasons discussed above, we construe "transmit a notification via simple message service responsive to determining that the cellular remote unit is outside of the geo-fence" to include at least "transmitting, via SMS, a command, a status message, or information that a remote unit is outside a geo-fence responsive to determining that the remote unit is outside the geo-fence."

C. Obviousness over Oinonen, Whitley, and Coon

Petitioner argues claims 1, 4–8, 10, 12–14, 16, 17, 20, 22, and 23 are unpatentable as obvious over Oinonen, Whitley, and Coon. Pet. 17–37. Patent Owner disagrees. PO Resp. 22–42. For the reasons discussed below, Petitioner demonstrates by a preponderance of evidence that claims 1, 4–8, 10, 12–14, 16, 17, 20, 22, and 23 are unpatentable as obvious over Oinonen, Whitley, and Coon.

1. Oinonen

Oinonen discloses telemetric "applications in which the state of a peripheral device is monitored and the peripheral device is controlled via a telecommunication network, preferably at least partly via a mobile communication network." Ex. 1016, 3:22–26. Examples of telemetric applications include "a real estate alarm system for monitoring real estate for fire, leakage, [or] burglary" and a heating system "in which the heating of an apartment can be set by telephone . . . so that the heating can be switched from a lower output to a higher output, or vice versa, by calling a certain telephone number." *Id.* at 3:27–29, 3:66–4:3.

Oinonen describes the invention as follows:

> The invention is based on the idea that the telecommunication terminal, preferably a mobile station coupled with a peripheral device via a connecting interface, transmits short messages or the like to another telecommunication terminal preferably via a mobile communication network. In a corresponding manner, control signals can be transmitted as short messages from the second telecommunication terminal to the first telecommunication terminal, where the device coupled therewith is controlled on the basis of the short messages via the connection interface.

Id. at 4:52–61.

Figure 4 of Oinonen, reproduced below, is an example of such a system.

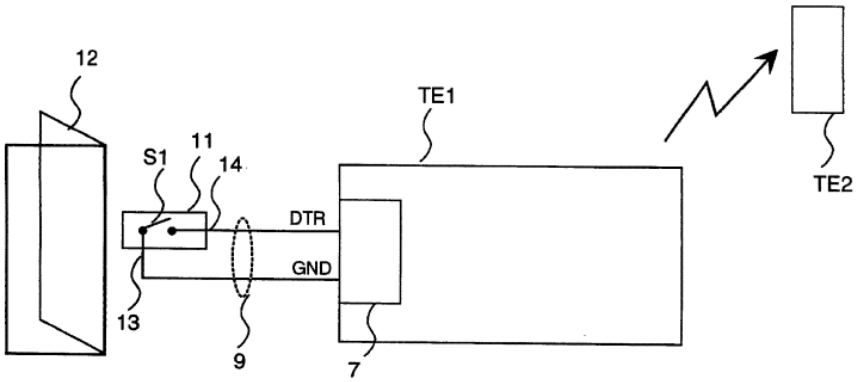

Figure 4 of Oinonen is a block diagram illustrating peripheral device 11 (i.e., switch S1) connected to door 12 to indicate whether door 12 is open or closed. *Id.* at 9:26–28. Switch S1 is connected to mobile terminal TE1 via ground (GND) and data terminal ready (DTR) lines of connection interface 7. *Id.* at 9:28–34. When door 12 is open, 5V appears between DTR and GND, and when door 12 is closed, 0V appears between DTR and GND. *Id.* at 9:38–44.

Mobile terminal TE1 includes microprocessor 1 running application software for "examining the logical states of the input lines of th[e]

connection interface 7 and for setting the logical states of the different output lines to the value (0/1) required at the time." *Id.* at 7:12–26, 9:44–49, Fig. 3.[8] The application software transmits "the states of all input lines at the moment of examination, advantageously as a short message to the second telecommunication terminal TE2." *Id.* at 10:38–42. The application software includes a message interpreter that allows TE1 and TE2 to interpret received messages. *Id.* at 8:33–37. Thus, TE1 can send standard texts to TE2 such as "door is closed" or "door is open" instead of logical states 0 or 1, respectively. *Id.* at 10:48–54. When a mobile terminal is unable to interpret such a message, it transmits an error message "as a short message to the telecommunication terminal TE1, TE2 that sent the control message." *Id.* at 8:50–55.

In addition to monitoring the open/closed status of door 12, Oinonen discloses applications that monitor the status of a real estate alarm system, control the luminosity in a room, and control the locking/unlocking of a door. *Id.* at 10:63–66, 11:12–14, 11:46–57, 12:13–15, Figs. 5–7.

2. Whitley

Whitley discloses "a system and method for gathering and sending data over an existing wireless network remotely to control and monitor various gateways and the devices coupled to those gateways." Ex. 1023, 2:19–21. Such a system is shown in Figure 1 of Whitley, which is reproduced below.

[8] Mobile station TE2 has a similar structure. *See* Ex. 1016, 7:52–54.

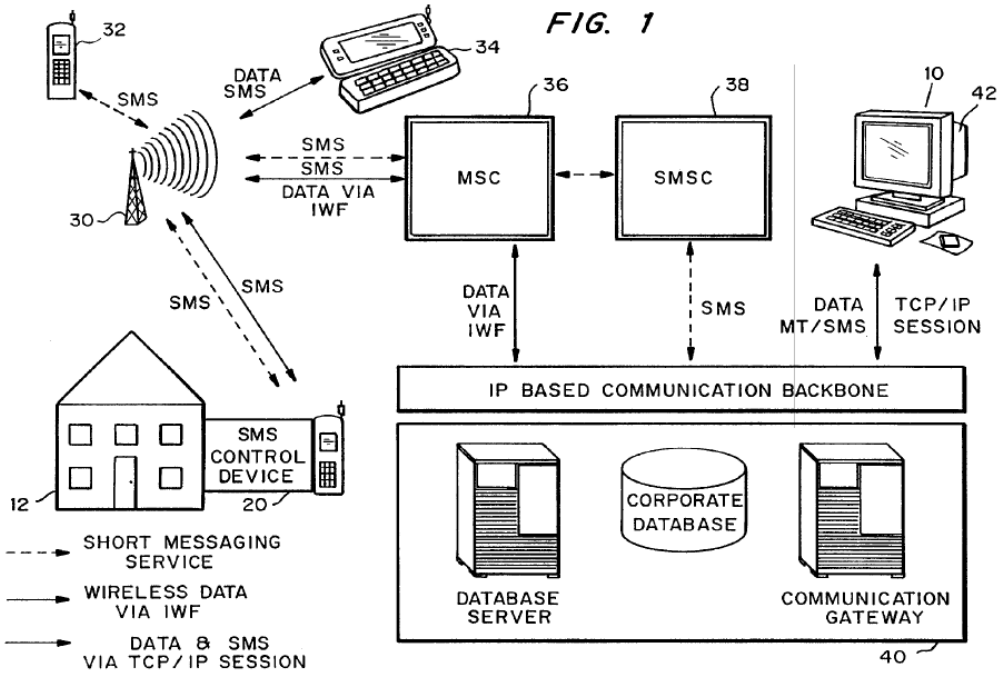

Figure 1 of Whitley is a block diagram of a system that "implements various methods for receiving and sending data from and to a selected gateway." *Id.* at 7:13–15. The system includes facility 12, gateway 20 (e.g., an SMS control device), and cellular handset 32. *Id.* at 7:26–8:10.

Gateway 20 provides a physical interface between devices internal to facility 12 and external networks, and can "monitor and control various devices within the facility 12, such as lights, security sensors, an answering machine, [or] a home computer." *Id.* at 8:27–9:3. Gateway 20 is uniquely addressable, and includes a processor and "a wireless transceiver for sending and receiving communications via a digital wireless network." *Id.* at 9:3–8. The digital network allows gateway 20 "to send data [to] and receive commands directly from [a] customer, which could own or manage the facility." *Id.* at 2:23–25. This allows the customer to "control lights within a facility according to a pre-programmed pattern that the user may change by communicating new commands," and to have "remote control over the

devices (e.g., home appliances or electronics) with which the gateway may communicate." *Id.* at 3:9–13.

In one implementation, gateway 20 "formulates messages to other terminals into a short message format" (i.e., SMS), and "transmit[s] the message . . . to a network element" such as a customer's mobile terminal. *Id.* at 5:18–28. Because gateway 20 is uniquely addressable (e.g., via its phone number), "the customer can formulate messages or commands that will be routed directly from the customer's mobile station . . . to the gateway." *Id.* at 6:10–14. Thus, Whitley "provide[s] a method for allowing customers to remotely monitor and control devices located in the customer's facility." *Id.* at 6:19–21. In particular, customers can "receive monitoring information about activities at their facility via a mobile station" and "control the gateway and devices coupled to the gateway from their mobile station." *Id.* at 6:22–26. For example, customers can "monitor[] facility 12 for energy usage data or alarms indicating a security breach," and control "various electronic devices, such as an electronic thermostat or lights." *Id.* at 12:21–25. Other types of devices that can be monitored and controlled include a "refrigerator, water heater, and [a] washer/dryer." *Id.* at 16:21–23. Monitoring the energy usage of facility 12 allows a remote customer "to adjust the thermostat, or turn off one of the devices (such as the washer/dryer or water heater) coupled to the gateway 20 in order to save energy." *Id.* at 17:2–4.

3. Coon

Coon discloses a "wireless mobile device [that] determines its own location with respect to [a] control device." Ex. 1019 ¶ 15. Coon's mobile device includes processor 102, memory 104, display 106, GPS receiver 108, and wireless transceiver 110. *Id.* ¶ 16. "When the mobile device is within a

predetermined control range" of the control device, "the mobile device sends a message to the control device to initiate performance of an appropriate function or functions" on one or more device(s) connected to the control device. *Id.* ¶ 15. The message can be an SMS message. *Id.* ¶ 19. The connected devices can be "any of a number of devices that are normally located within a building, for example, a security system, a smoke detector, a light, a coffeemaker, a garage door opener, an electric door lock, a thermostat, and a curtain." *Id.* ¶ 18. In this way, "various building functions can be initiated based upon the location of the wireless mobile device." *Id.* ¶ 15. For example, "when the mobile device 120 is within three-hundred feet of the control device 140, the control device 140 may cause a security system to be disarmed, a light to be illuminated, a garage door to be opened, a door to be unlocked, a thermostat to be set to an appropriate level, and one or more curtains to be closed or opened." *Id.* ¶ 19. Similarly, "when the mobile device 120 moves more than three-hundred feet away from the control device 140, the control device 140 may cause the security system to be armed and a door to be locked." *Id.*

4. Reasons to Combine the Teachings of Oinonen, Whitley, and Coon

Petitioner argues Oinonen "does not expressly articulate how its telecommunications device would be configured to monitor and/or control multiple devices," whereas Whitley "specifically discloses a data collection and control device (a 'gateway') that is connected to multiple devices." Pet. 17–18 (citing Ex. 1003 ¶¶ 201–205). Therefore, Petitioner argues a person of ordinary skill in the art would have combined the teachings of Oinonen and Whitley because Whitley teaches (1) using SMS to "provide remote monitoring and control of multiple distributed gateways," (2) using a gateway to "remotely monitor and control multiple devices," and

(3) "monitoring . . . activities at a facility over time, such as energy use trends, which allows the user to save energy." *Id.* at 18 (citing Ex. 1003 ¶¶ 204, 205). Petitioner further argues a person skilled in the art would have combined the teachings of Oinonen and Whitley "to 'provide a method for allowing customers to receive monitoring information about activities at their facility.'" *Id.* (quoting Ex. 1023, 6:22–26).

Petitioner argues that Coon teaches the advantages of proximity-based control over other types of control, such as schedule-based control. *Id.* at 19. For example, relying on the testimony of Dr. Jeffay, Petitioner argues proximity-based control increases efficiency by deactivating devices that are not in use, increases safety by activating security systems and locking doors when a user is away, and increases convenience by applying user settings when the user is nearby. *See* Ex. 1003 ¶ 214. Therefore, Petitioner argues, a person skilled in the art would have modified the Oinonen/Whitley control system to provide proximity-based control in order to increase efficiency, convenience, and safety. *Id.* (citing Ex. 1003 ¶¶ 214, 215).

Patent Owner argues "Petitioner[] fail[s] to establish that Oinonen and Whitley can be properly combined for two reasons." PO Resp. 22. First, Patent Owner argues Petitioner's reasoning for combining the two references is not "relevant to the elements of the challenged claims," i.e., because "none of the challenged claims recites multiple devices—they only require 'an environmental device.'" *Id.* at 24–25. Second, Patent Owner argues "Petitioner identifies no failing in Oinonen that would provoke a [person of ordinary skill in the art] to turn to Whitley." *Id.* at 24. That is, Patent Owner argues that because "Petitioners assert that Oinonen by itself discloses all the elements of independent claims 1 and 24 (except the elements for which they rely on [references other than] Whitley) . . . it is unclear why they

contend a [person of ordinary skill in the art] would be motivated to turn to Whitley for the claimed features." *Id.* at 23.

Upon considering Petitioner's and Patent Owner's evidence and arguments, we find Petitioner has set forth sufficient reasoning with rational underpinning to combine the teachings of Oinonen, Whitley, and Coon. Oinonen teaches a system for monitoring and controlling a single device, and Whitley teaches an improvement that would allow Oinonen's system to monitor and control multiple devices via a gateway. *Compare* Ex. 1016, 4:41–61, *with* Ex. 1023, 6:19–21. This improvement supports the proposed combination because "if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill." *KSR Int'l Co. v.Teleflex, Inc*., 550 U.S. 398, 417 (2007) ("*KSR*"). Coon further improves upon the combination of Oinonen and Whitley by teaching proximity-based control, which improves the efficiency, convenience, and safety of remotely controlled systems. *See* Ex. 1003 ¶¶ 214–215.

We are not persuaded by Patent Owner's argument that the combination, particularly of Oinonen and Whitley, would not have been obvious because the claims recite controlling a single environmental device. First, the claims are open ended and do not prohibit controlling multiple environmental devices. *See* Ex. 1001, 13:57–14:26. Second, *KSR* does not require the reason to combine to directly relate to any claim element. Indeed, *KSR* expressly states the reason to combine "analysis *need not seek out precise teachings directed to the specific subject matter* of *the challenged claim*." *KSR* 550 U.S. at 418 (emphasis added). The reason for that is simple. Doing so would invite hindsight reasoning, which *KSR*

expressly rejects. *See id.* at 421 ("A factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning."). Replacing Oinonen's terminal with Whitley's gateway to allow Oinonen to monitor and control multiple devices would fall under many of the reasons to combine expressly endorsed in *KSR,* including the reason identified above, i.e., using a technique "used to improve one device. . . [to] improve similar devices in the same way." *Id.* at 416–417.

We are also not persuaded by Patent Owner's argument that Petitioner's reasoning is defective because Petitioner asserts that Oinonen itself discloses all of the elements of the independent claims. *See* PO Resp. 22–24. Patent Owner cites several Board decisions in support of this argument, none of which is precedential and binding on this panel, and all of which pre-date the Federal Circuit's *Polygroup* and *Realtime Data* decisions. In *Polygroup*, the Federal Circuit stated "when a petition sets forth a ground with multiple references, but the petitioner's primary arguments rely on a single reference, the Board should consider those arguments irrespective of a motivation to combine references." *Polygroup Ltd MCO v. Willis Elec. Co*., 759 F. App'x. 934, 943 n.3 (Fed. Cir. 2019). Indeed, the "Board err[s] when it refuse[s] to consider these arguments." *Id.* at 943; *see also Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1373 (Fed. Cir. 2019) (finding the Board "did not err when it concluded that claim 1 was invalid under § 103" based on the teachings of a single reference in a combination of references and "did not violate 35 U.S.C. § 312(a)(3) or other notice requirements" in doing so because "it is well settled that 'a disclosure that anticipates under § 102 also renders the claims invalid under § 103 . . . .'") (internal citations omitted).

5. Claim 1

Claim 1 recites a base unit configured to communicate with an environmental device and a cellular remote unit capable of communicating from a geographically remote location. Ex. 1001, 13:57–61. Petitioner demonstrates how Oinonen teaches such a base unit. *See* Pet. 20–21 (citing Ex. 1016, 6:60–7:4, 11:46–53). For example, Oinonen's TE1 is a base unit that communicates with an environmental device (electronic door lock)[9] and a cellular remote unit (TE2). Ex. 1016, 6:60–7:4, 11:46–53. Petitioner also demonstrates how Whitley teaches such a base unit. *See* Pet. 21–22 (citing Ex. 1023, 3:7–13, 8:6–10, 16:21–23). For example, Whitley's gateway 20 is a base unit that communicates with an environmental device (thermostat) and a cellular remote unit (mobile station). Ex. 1023, 3:7–13, 8:6–10, 16:21–23. Patent Owner does not dispute these contentions. *See* PO Resp. 27–35.

Claim 1 requires the base unit to include a first communication interface configured to receive environmental information from and send a control instruction to the environmental device. Ex. 1001, 13:62–65. Petitioner demonstrates how Oinonen's V.24 interface is a first communication interface. *See* Pet. 22–23 (citing Ex. 1016, 4:67–5:15, 6:60–64, 11:62–12:4). For example, Oinonen's TE1 (base unit) includes V.24 interface 7, which is configured to receive environmental information (locked/unlocked status) from an electronic door lock (environmental device) via line DTR and to send a control instruction (lock/unlock door) to the electronic door lock via line DSR. Ex. 1016, 4:67–5:15, 6:60–64, 11:62–

[9] The '655 patent identifies an electronic door monitoring system as an environmental device. *See* Ex. 1001, 6:29–36, 11:64–67.

12:4, Figs. 3, 4. Petitioner also demonstrates how the physical interface of Whitley's gateway 20 (base unit) is a first communication interface. *See* Pet. 21 (citing Ex. 1023, 8:27–9:1). For example, Whitley teaches gateway 20 provides a physical interface (first communication interface) between a thermostat (environmental device) and a network that can both monitor the thermostat (receive environmental information) and send control instructions to the thermostat. Ex. 1023, 8:27–9:3, 16:21–23. Patent Owner does not dispute these contentions. *See* PO Resp. 27–35.

Claim 1 further requires the base unit to include a wireless communication interface configured to send a first message to and receive a second message from the cellular remote unit via a cellular communications network. Ex. 1001, 13:66–14:3. Petitioner demonstrates how Oinonen's TE1 (base unit) includes such a wireless communication interface. *See* Pet. 23 (citing Ex. 1016, 4:52–62, 7:12–21). For example, TE1 (base unit) includes radio element 6 (wireless communication interface) configured to send a short message to and receive a short message from TE2 (cellular remote unit). Ex. 1016, 4:52–62, 7:12–21, Fig. 3. Petitioner also demonstrates how Whitley's gateway 20 (base unit) includes such a wireless interface. *See* Pet. 23–24 (citing Ex. 1023, 3:13–25, 9:6–8). For example, gateway 20 includes a transceiver (wireless interface) configured to send an SMS message to and receive an SMS message from a mobile station (cellular remote unit) over a cellular network. Ex. 1023, 3:13–25, 9:6–8. Patent Owner does not dispute these contentions. *See* PO Resp. 27–35.

Claim 1 further requires the first message to be a first digital communication message that includes a representation of the environmental information. Ex. 1001, 14:4–6. Petitioner demonstrates how Oinonen's TE1 (base unit) sends such a first message. *See* Pet. 24 (citing Ex. 1016,

4:67–5:6, 10:38–55, 11:8–11). For example, TE1 sends an SMS message (digital communication message) to TE2 (cellular remote unit) that includes a representation of environmental information (e.g., the locked/unlocked or open/closed state of the electronic door lock). Ex. 1016, 4:67–5:6, 10:38–55, 11:8–11. Petitioner also demonstrates how Whitley's gateway 20 (base unit) sends such a first message. *See* Pet. 25 (citing Ex. 1023, 5:18–20, 8:1–5, 12:21–13:2). For example, gateway 20 sends an SMS (digital communication) message to a mobile station (remote unit) that includes a representation of environmental information (e.g., an alarm indicating a security breach). Ex. 1023, 5:18–20, 8:1–5, 12:21–13:2). Patent Owner does not dispute these contentions. *See* PO Resp. 27–35.

Claim 1 further requires the second message to be a second digital communication message issued by a user of the cellular remote unit that includes a command for the base unit regarding the environmental device. Ex. 1001, 14:7–9, 14:15–16. Petitioner demonstrates how Oinonen's TE1 (base unit) receives such a second message. *See* Pet. 25 (citing Ex. 1016, 4:52–61, 4:67–5:15, 11:62–12:12). For example, TE1 receives an SMS (digital communication) message from a user of TE2 (remote unit) that includes a command to lock the electronic door lock (environmental device). Ex. 1016, 4:52–61, 4:67–5:15, 11:62–12:12. Petitioner also demonstrates how Whitley's gateway 20 (base unit) receives such a second message. *See* Pet. 25–26 (citing Ex. 1023, 2:23–25, 6:12–14, 10:14–17, 17:2–7). For example, gateway 20 receives an SMS (digital communication) message from the user of a mobile station (remote unit) that includes a command to adjust the temperature setting of a thermostat (environmental device). Ex. 1023, 2:23–25, 6:12–14, 10:14–17, 17:2–7. Patent Owner does not dispute these contentions. *See* PO Resp. 27–35.

Claim 1 further requires the base unit to include a microcontroller configured to process the second message (command), provide a control instruction based on the command, and send the control instruction to the environmental device via the first communications interface. Ex. 1001, 14:10–19. Notwithstanding Patent Owner's arguments to the contrary, discussed *infra*, Petitioner demonstrates how Oinonen's TE1 (base unit) includes such a microcontroller. *See* Pet. 26–27 (citing Ex. 1016, 4:52–61, 5:6–13, 7:11–19, 8:34–37, 11:62–12:12). TE1 includes MCU or processor 1 (microcontroller) that interprets (processes) a message to "lock the door" (second message), and sets a voltage (sends control instruction) on the DSR line of its V.24 (first communications) interface to the electronic door lock (environmental device). Ex. 1016, 4:52–61, 5:6–13, 7:11–19, 8:34–37, 11:62–12:12. Petitioner also demonstrates how Whitley's gateway 20 (base unit) includes such a microcontroller. *See* Pet. 27–28 (citing Ex. 1023, 2:23–27, 3:11–14, 9:4–5, 9:23–25, 10:14–17, 17:2–7). Gateway 20 includes a processor (microcontroller) that reads and processes an SMS message (second message) to obtain instructions to adjust a thermostat (control instructions) and sends the instructions to the thermostat (environmental device) via gateway 20's physical (first communication) interface. Ex. 1023, 2:23–27, 3:11–14, 9:4–5, 9:23–25, 10:14–17, 17:2–7.

Patent Owner argues Oinonen's microprocessor and Whitley's 386 processor are not microcontrollers because a person skilled in the art "would not have understood that the claimed 'microcontroller' is a generic processor," but would have instead "understood that microcontrollers and microprocessors are distinctly different devices." PO Resp. 27. Patent Owner's arguments rely on its proposed construction of "microcontroller." *Id.* at 28–31. For the reasons discussed in § II.B.3, *supra*, we construe

"microcontroller" to mean "a microcomputer, microprocessor, or other equipment used for process control." Consequently, Oinonen's microprocessor and Whitley's 386 processor are microcontrollers because they are programmed to (a) receive information from an environmental device, (b) send SMS messages containing that information to a remote device, (c) receive SMS messages containing a command from the remote device, and (d) control the environmental device as commanded.

Claim 1 further requires the cellular remote unit to be configured to determine its position data and whether it is outside a geo-fence. Ex. 1001, 14:20–23. Petitioner demonstrates how Oinonen's TE2 or Whitley's mobile device (cellular remote units), when modified as taught by Coon, meet these limitations. *See* Pet. 28–29 (citing Ex. 1019 ¶¶ 16, 19, Fig. 3). For example, Coon teaches mobile device 120 (remote unit) is configured to determine whether it is more than 300 feet from (determine position and whether outside a geo-fence) control device 140 (base unit). Ex. 1019 ¶¶ 16, 19, Fig. 3. Patent Owner does not dispute these contentions. *See* PO Resp. 27–35.

Claim 1 further requires the cellular remote unit be configured to transmit a notification via a simple message service responsive to determining that it is outside the geo-fence. Ex. 1001, 14:23–26. Notwithstanding Patent Owner's arguments to the contrary, discussed *infra*, Petitioner demonstrates how Oinonen's TE2 or Whitley's mobile device (cellular remote units), modified as taught by Coon, meet these limitations. *See* Pet. 29–30 (citing Ex. 1019 ¶¶ 15, 16, 19); Pet. Reply 17–19 (citing Ex. 1019 ¶¶ 16, 28). For example, Coon teaches mobile device 120 (remote unit) "determines its own location with respect to the control device [base unit]," including "when the mobile device moves more than three-hundred

feet away from the control device 140 [outside geo-fence]." Ex. 1019 ¶¶ 15, 19. Mobile device 120 can "transmit a control message [notification] to the control device 140 based upon [its] location." *Id.* ¶ 15. As a result, "control device 140 initiates performance of an appropriate function or functions," such as causing a "security system to be armed and a door to be locked." *Id.* ¶¶ 16, 19.

Patent Owner argues "Coon does not disclose that its mobile device sends a notification reporting that its location is outside of the geo-fence (e.g., to notify a parent that a child has left the permitted boundaries)." PO Resp. 33. Patent Owner further argues that sending a command to lock a door is not the same as sending a notification because "the control system does not know that it received that command because the mobile device entered the geo-fence," e.g., because such a command may be issued "even when the user is inside the geo-fence." *Id.* at 33–34.

We are not persuaded by Patent Owner's arguments, which rely on Patent Owner's interpretation of the "transmit a notification" limitation, which excludes transmitting commands and requires reporting information that the remote unit crossed a geo-fence. *See* PO Resp. 15–18. We reject that interpretation for the reasons explained in § II.B.4, *supra*. Specifically, a plain reading of claim 1 requires the remote unit to "transmit a notification" when it crosses the geo-fence, not to "transmit a notification indicating it has crossed the geo-fence." Ex. 1001, 14:23–26. Moreover, the '655 patent discloses that when the remote unit crosses a geo-fence it can transmit a notification that doesn't indicate the geo-fence has been crossed, such as a "status message." *Id.* at 8:62–65. Lastly, Coon's disclosure is not limited to sending a command to lock a door when the remote unit crosses a geo-fence. Coon more generally discloses the remote unit "transmit[s] a

control message . . . based upon [its] location" that causes the "control device 140 [to] initiate[] performance of an appropriate function." Ex. 1019 ¶ 16.

For the reasons discussed above, Petitioner demonstrates by a preponderance of evidence that a person skilled in the art would have had a rational reason to combine the teachings of Oinonen, Whitley, and Coon, and that the combination teaches all the limitations of claim 1. Accordingly, Petitioner has demonstrated that claim 1 is unpatentable over the combination of Oinonen, Whitley, and Coon.

6. Claims 4–8, 10, 12–14, 17, 20, 22, and 23

Petitioner further maps the teachings of Oinonen, Whitley, and Coon to the additional limitations recited in dependent claims 4–8, 10, 12–14, 17, 20, 22, and 23. *See* Pet. 30–37. Patent Owner contends these claims are patentable for the same reasons as claim 1. *See* PO Resp. 35–36. We are not persuaded by Patent Owner's arguments for the same reasons discussed in §§ II.C.4 and II.C.5, *supra*. Moreover, we find Petitioner demonstrates by a preponderance of evidence how the combination of Oinonen, Whitley, and Coon teach all the limitations recited in claims 4–8, 10, 12–14, 17, 20, 22, and 23 for the reasons stated in the Petition as briefly discussed below.

Claims 4 and 5, respectively, require the remote unit to adjust the temperature of a water heater and to adjust an air handling system. *See* Ex. 1001, 14:33–36. Petitioner demonstrates how the '655 patent discloses an air handling system can be adjusted by a thermostat, and Whitley teaches controlling home appliances such as a thermostat and water heater. Pet. 30–31 (citing Ex. 1001, 6:8–13; Ex. 1023, 3:7–14, 8:27–9:1, 16:23–17:5). Claims 6 and 7, respectively, require the cellular network to include data bearer service and the remote unit to be mobile. Ex. 1001, 14:37–40.

Petitioner demonstrates how Oinonen's TE2 and Whitley's mobile device are mobile phones that use a GSM cellular network, and Dr. Jeffay provides unrebutted testimony that a person skilled in the art would have known that a GSM network includes a data bearer service. Pet. 31–32 (citing Ex. 1003 ¶¶ 301–302; Ex. 1016, 6:64–7:4, 13:15–20; Ex. 1023, 8:14, 17:17–25).

Claim 8 requires the received commands and control instructions, respectively, to include environmental commands and control instructions. Ex. 1001, 14:41–43. Petitioner demonstrates how Oinonen discloses the received commands and control instructions are environmental commands and control instructions, e.g., commands to "lock the door" and control instructions setting an appropriate "operating voltage" on the DSR line of the V.24 interface. Pet. 32 (citing Ex. 1016, 11:62–12:4). Claim 10 depends from claim 1, and includes all the limitations of claims 6–8. *Compare* Ex. 1001, 14:47–54, *with id.* at 14:37–43. Petitioner demonstrates how these limitations are met for the same reasons as claims 6–8. *See* Pet. 33. Claim 13 requires the remote unit to be a cell phone and the environmental device to be a thermostat, and claim 14 requires the environmental device to be one of a list of items, including a thermostat. Ex. 1001, 14:62–67. Petitioner demonstrates how these limitations are met for the same reasons as claims 5 and 7. *See* Pet. 34.

Claim 12 requires the microcontroller to process the environmental information into the representation of the first message and to process the command of the second message into a control instruction. Ex. 1001, 14:58–61. Petitioner demonstrates how Oinonen and Whitley disclose these limitations. Pet. 33–34 (citing Ex. 1016, 4:52–61, 4:67–5:13, 8:33–37; Ex. 1023, 3:11–12, 8:1–2, 8:27–9:1, 9:23–25). Oinonen's TE1 includes processor 1, which (a) receives information from an environmental device

(electronic door lock) on the V.24 interface and processes the information to generate the first message (e.g., door is open) sent to TE2, and (b) receives a command from TE2 (e.g., close the door) and processes the command to generate a control instruction by setting a voltage on the DSR line of the V.24 interface. Ex. 1016, 4:52–61, 4:67–5:13, 8:33–37. Whitley's gateway 20 includes a processor that (a) receives and packages data sent by a controlled environmental device and sends the data to a mobile station, and (b) receives and processes an SMS command from the mobile station to control the environmental device. Ex. 1023, 3:11–12, 8:1–2, 8:27–9:2, 9:23–25. Claim 23 requires the base unit's microcontroller to send status information to the remote unit on a periodic basis. Ex. 1001, 15:24–26. Petitioner demonstrates how the processor (microcontroller) in Whitley's gateway 20 (base unit) periodically (every five minutes) monitors an environmental device and sends SMS messages containing device status information to a mobile device (remote unit). Pet. 37 (citing Ex. 1023, 12:23–27).

Claim 17 requires the remote unit to determine when it is within a geo-fence. Ex. 1001, 15:5–7. Petitioner demonstrates how Coon discloses determining "when the mobile device 120 is within three-hundred feet of the control device 140." Pet. 35 (quoting Ex. 1019 ¶ 19). Claim 20 requires the received command to include cellular data. Ex. 1001, 15:15–16. Petitioner demonstrates how Oinonen and Whitley transmit commands over a GSM cellular network, i.e., using cellular data. Pet. 36 (citing Ex. 1016, 2:38–41, 4:57–61; Ex. 1023, 3:19–20). Claim 22 requires the base unit to include a cellular module that communicates over a cellular network. Petitioner demonstrates how Oinonen's TE1 and Whitley's gateway 20 include cellular modules because they communicate over a GSM cellular network. Pet. 36–

37 (citing Ex. 1016, 1:51–2:31, 2:42–44, 7:12–21, 13:15–20 ; Ex. 1023, 3:13–25, 9:6–8).

For the reasons discussed above, Petitioner demonstrates by a preponderance of evidence that a person skilled in the art would have had a rational reason to combine the teachings of Oinonen, Whitley, and Coon, and that the combination teaches all the limitations of claims 4–8, 10, 12–14, 17, 20, 22, and 23. Accordingly, Petitioner has demonstrated that claims 4–8, 10, 12–14, 17, 20, 22, and 23 are unpatentable over the combination of Oinonen, Whitley, and Coon.

7. Claim 16

Claim 16 requires the cellular network to include simple message service. Ex. 1001, 15:3–4. As discussed in § II.B.2, *supra*, we construe "simple message service" to mean "short message service" or SMS. Petitioner relies on its analysis of claim 1 to demonstrate how Oinonen and Whitley disclose sending and receiving SMS messages over a cellular network. *See* Pet. 35. We agree with that analysis for the reasons discussed in § II.C.5, *supra*.

Patent Owner argues "Oinonen and Whitley would not have enabled a [person skilled in the art] to implement the claimed SMS messaging in a base unit without undue experimentation." PO Resp. 36. Relying on the testimony of Mr. Zatkovich, Patent Owner argues "Oinonen and Whitley fail to disclose . . . at least two technical requirements for a solution enabling a computing device sending/receiving SMS messages using an associated cellular phone." *Id.* at 36–37 (citing Ex. 2002 ¶¶ 100–101). First, the references fail to disclose a base unit having "a hardware and software interface" enabling the base unit to send/receive SMS messages. *Id.* at 37 (citing Ex. 2002 ¶¶ 102–103). Second, the references fail to disclose a

mobile phone having "a software interface (API) for the SMS functions" that enable the mobile phone to send/receive SMS messages. *Id.* at 37–38 (citing Ex. 2002 ¶ 104).

Petitioner characterizes Patent Owner's arguments as disingenuous because "the 655 Patent itself does not describe either of these [two] solutions" that are allegedly required for sending SMS messages. Pet. Reply 25. Moreover, Petitioner argues a § 103 reference is prior art for all it discloses and need not be enabling. *Id.* at 26 (quoting *Amgen Inc. v. Hoechst Marion Roussel, Inc.*, 314 F.3d 1313, 1357 (Fed. Cir. 2003)). Patent Owner responds that "enablement of the '655 patent is not at issue in this proceeding" and that "taking each reference for what it teaches fails to cure the problem" because neither reference "enables an SMS-capable base unit." PO Sur-Reply 16.

As discussed above, Petitioner has demonstrated how Oinonen and Whitley, separately and in combination, teach a base unit that sends/receives SMS messages to/from a remote unit. We are unpersuaded by Patent Owner's non-enablement arguments. Oinonen discloses base/remote units TE1/TE2 are "*conventional mobile stations equipped with the option for transmitting short messages*." Ex. 1016, 4:63–67, 6:60–67 (emphasis added). In particular, TE1/TE2 use "the short message system of the GSM mobile communication system" to send/receive SMS messages, where GSM (Global System for Mobile) is an industry standard published by the "European Telecommunication Standards Institute ETSI." *Id.* at 2:60–61, 13:15–17. Similarly, Whitley discloses gateway 20 (base unit) and mobile terminal (remote unit) use conventional GSM networks to send/receive SMS messages. Ex. 1023, 3:15–25, 5:15–6:14, 7:28–8:10. Gateway 20 is "an integrated *GSM enabled communications device programmed to format and*

manage data packets sent and received via the short messaging service provided by a GSM network." *Id.* at 9:9–12 (emphases added). The mobile terminal includes a commercially available front-end client application that "enables end users to input a text message . . . and send the message . . . for distribution across the GSM network." *Id.* at 10:16–22. The '655 patent similarly discloses (1) use of "the cell phone network's short message service ("SMS") in which text messages are sent to and received from a controlled system," (2) "the remote control units are conventional cellular telephone handsets," and (3) the "base control unit 16 uses a cellular telephone module." Ex. 1001, 3:8–11, 7:10–11, 11:23–24; *see also id.* at 3:58–4:7, Fig. 1 (showing base control unit (BCU) 16 communicating with remote control units (RCUs) 12/26 via cell towers 24 of a conventional cellular network 22).

For the reasons discussed above, Petitioner demonstrates by a preponderance of evidence that a person skilled in the art would have had a rational reason to combine the teachings of Oinonen, Whitley, and Coon, and that the combination teaches all the limitations of claim 16. Accordingly, Petitioner has demonstrated that claim 16 is unpatentable over the combination of Oinonen, Whitley, and Coon.

D. Obviousness over Oinonen, Whitley, Coon, and Ehlers

Petitioner argues claims 2, 3, 9, 11, 15, 18, 19, and 21 are unpatentable as obvious over Oinonen, Whitley, Coon, and Ehlers. Pet. 3, 37–45. Patent Owner disputes this. PO Resp. 42–44. For the reasons discussed below, we find Petitioner has demonstrated by a preponderance of evidence that claims 3, 15, 18, 19, and 21 are unpatentable as obvious over Oinonen, Whitley, Coon, and Ehlers, but have failed to demonstrate by a

preponderance of evidence that claims 2, 9, and 11 are unpatentable over that combination.

1. Ehlers

Ehlers discloses "a system and method for managing the delivery and usage of a commodity such as electricity, natural gas, steam, water, chilled or heated water, or potable or recycled water." Ex. 1020 ¶ 2. Ehlers' system includes utility 1.06 having control system 1.12 in two-way communications with metered customer device 1.08 (e.g., a power meter) via communication gateway 1.10, which may be integrated with or separate from customer device 1.08. *Id.* ¶¶ 59–62, 68, Figs. 1A–1B, 2B–2D.

Utility 1.06 can "monitor and control the usage of electricity by controlling the [gateway] nodes 1.10 and/or the devices 1.08." *Id.* ¶ 78. Utility 1.06 can also "define, modify, implement, and engage one or more Power Supply Program[s] . . . to alleviate or reduce energy demand during peak periods." *Id.* For example, utility 1.06 can disallow the running of "pool pumps . . . during a set period of the day" by sending a signal from utility control system 1.12 to gateway 1.10 "to disable the pool pump during the first time period." *Id.* ¶ 81.

Ehler's customer devices 1.08 can be controlled via a graphical user interface (GUI) 1.14 incorporated on a device linked to gateway 1.10 via a wireless data network. *Id.* ¶ 69, Fig. 1B. The various windows of GUI 1.14 are shown in Figures 4A–4R of Ehlers and can be displayed on a mobile phone. *Id.* ¶¶ 30–47, 311. Figure 4C of Ehlers is reproduced below.

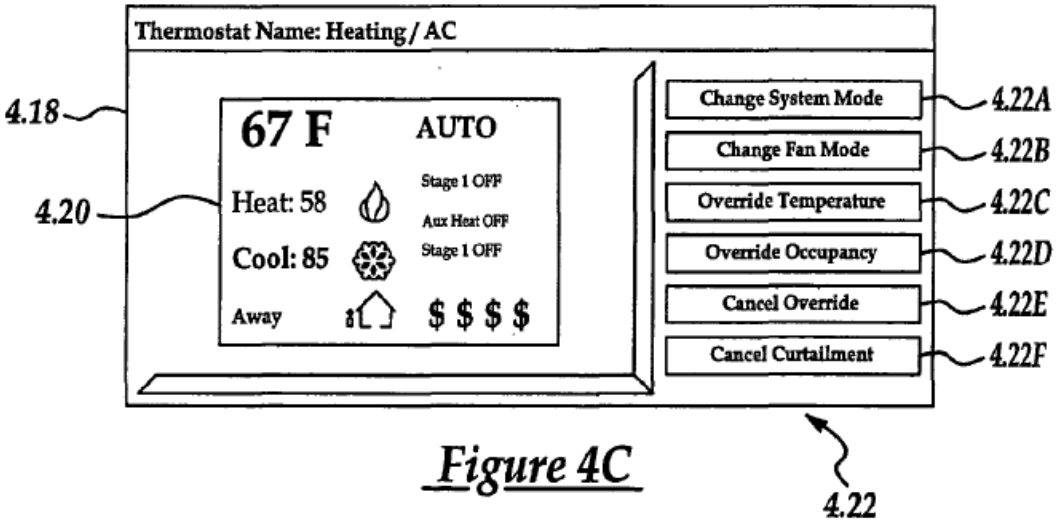

Figure 4C of Ehlers illustrates virtual thermostat 4.18 containing current information 4.20 for a remotely monitored HVAC system (temperature, heating and cooling set-points, and operating mode) and control buttons 4.22 to control the system. *Id.* ¶ 316. Using buttons 4.22, a customer can change the HVAC system's operating parameters such as the heating and cooling set-points. *Id.* Using GUI 1.14, a user can "directly access and control in-home devices 1.08" and can also sign up to participate in a utility defined energy conservation program. *Id.* ¶¶ 78, 116, 336.

Devices 1.08 in Ehler's system can also utilize externally supplied information, such as weather forecasts, to determine their operating conditions. *Id.* ¶¶ 88, 187, 230–231.

2. *Reasons to Combine the Teachings of Oinonen, Whitley, Coon, Ehlers*

Petitioner argues Ehlers, like Oinonen, Whitley, and Coon, discloses a system for remotely monitoring and controlling environmental devices via mobile devices. Pet. 37–38. Petitioner argues Ehlers also teaches several improvements to such systems, including the ability to (a) join "well-known demand reduction programs," (b) use "occupancy sensors and/or location-based control," (c) rely on "third party data, such as weather data, to setup

and/or adjust current settings," (d) integrate or separate base units (gateways) and controlled devices, and (e) control devices using a graphical "user interface with a rich set of functions and features." *Id.* at 38–39 (citing Ex. 1020 ¶¶ 7, 13, 68, 115–116, 231, 335). Petitioner argues these improvements would have motivated a skilled artisan to modify the system of Oinonen, Whitley, and Coon for several reasons. *Id.* at 38. For example, such a modification would allow a user to (a) join a demand reduction program "to obtain financial incentives," (b) use occupancy sensors to reduce the need "to track the usage of controlled devices," (c) use weather data to "adjust current settings," (d) integrate base (gateway) and controlled devices to "save space, reduce costs, and improve aesthetics," and (e) use a function-rich GUI to "improve[] customer usability." *Id.* at 38–39. Patent Owner does not dispute Petitioner's reasoning. *See* PO Resp. 42–44.

Petitioner demonstrates sufficient reasoning to combine the teachings of Oinonen, Whitley, Coon, and Ehlers. Oinonen, Whitley, and Coon teach using a remote unit (mobile phone) to monitor and control an environmental device. Ex. 1016, 6:64–7:4; Ex. 1019 ¶ 16, Ex. 1023, 6:22–29. Ehlers teaches using a GUI displayed on a mobile device to remotely monitor and control an environmental device, and to further control the environmental device using utility demand reduction programs, occupancy sensors, and external data. Ex. 1020 ¶¶ 7, 13, 115–116, 230–231, Fig. 1B. Thus, Petitioner's proposed combination is one of "familiar elements according to known methods" to yield predicable results. *KSR* 550 U.S. at 416.

3. Claims 2, 9, and 11

Claim 1 requires a base unit configured to receive from a cellular remote unit a second message containing a command for an environmental device, and a microprocessor in the base unit configured to process the

second message and send *a control instruction based on the command* to the environmental device. *See* Ex. 1001, 13:57–14:15. Claim 2 depends from claim 1 and requires the command to be a command to enter an energy conservation mode associated with multiple environmental devices. *Id.* at 14:27–30. Claim 9 depends from claim 1 and requires the command to be an energy conservation command associated with multiple environmental devices. *Id.* at 14:44–46. Claim 11 indirectly depends from claim 1 and requires the second message to include an energy conservation command associated with multiple environmental devices. *Id.* at 14:47–57.

Petitioner relies on Ehlers to teach the limitations recited in claims 2, 9, and 11. *See* Pet. 40, 43. Specifically, Petitioner argues Ehlers teaches these limitations by sending a command to participate or cancel participation in a utility's power saving program. *Id.* at 40 (citing Ex. 1020 ¶¶ 197, 316). Petitioner also argues Ehlers teaches these limitations by setting a total power limit for all devices in a home. *Id.* (citing Ex. 1020 ¶ 221).

In our Institution Decision, we found Petitioner was unlikely to demonstrate the unpatentability of claims 2, 9, and 11. *See* Dec. Inst. 33–35. Specifically, we found Ehlers' command to participate in a utility's power saving program is sent to the utility's control system 1.12, rather than to gateway 1.10 (base unit), because it is control system 1.12 that sends *control instructions based on the command* to environmental devices 1.08. *See* Ex. 1020 ¶ 81, Figs. 1A–1B (disclosing *utility control system 1.12* sends a signal (control instruction) to gateway 1.10D (base unit) to disable pool pump 1.30B (environmental device)). Similarly, Ehlers' command to gateway 1.10 to set a limit on a home's total power consumption does not cause gateway 1.10 to send a *control instruction based on the command* to environmental device 1.08. Rather, a device 1.08 wishing to draw power

sends a third message to gateway 1.10 and gateway 1.10 sends a *control instructions based on the third message* either granting or denying the request. *See, e.g.*, *id*. ¶ 221 ("[I]f another device 1.08 . . . wanted to perform a function, the device 1.08 . . . may query the gateway node 1.10D for permission. If the requested function would cause total demand to exceed this [total power limit] amount . . . the gateway node 1.10D may not allow the device 1.08 to perform that function.").

Patent Owner agrees with our preliminary findings and argues "Petitioner[] ha[s] not sufficiently demonstrated that the proposed combination teaches the additional recitations" of claims 2, 9, and 11. PO Resp. 42–44. Petitioner responds that Patent Owner ignores the disclosures of the Oinonen/Whitley combination and fundamentally misunderstands the teaching of Ehlers. Pet. Reply 27. Petitioner argues the Oinonen/Whitley combination discloses the limitations of claim 1, and Ehlers "discloses a nearly identical system that is focused on reducing energy costs" and that is deployed by utilities. *Id.* at 27–28. Additionally, Petitioner argues Ehlers discloses sending a command to enter an energy conservation mode by "send[ing] commands to set . . . occupancy modes" to multiple devices in order to conserve energy. *Id.* at 28–29 (citing Ex. 1020 ¶¶ 244, 319, 332, Figs. 4E, 4F). Patent Owner argues the latter argument is "a wholly new theory," which we should not consider because Patent Owner "does not have the opportunity to fully respond." PO Sur-Reply 17.

Upon consideration of the evidence and arguments presented, we find Petitioner has failed to demonstrate on this record that claims 2, 9, and 11 are unpatentable over Oinonen, Whitley, Coon, and Ehlers. First, the Petition fails to demonstrate that the combination teaches the limitations required by these claims for the reasons stated in our Institution Decision.

See Dec. Inst. 33–34. We disagree with Petitioner's contention that the analysis in our Institution Decision, which Patent Owner has adopted, attacks the teachings of Ehlers separately instead of considering the combined teachings of Oinonen, Whitley, Coon, and Ehlers. Petitioner identifies Ehlers' command to join a utility's power saving program as an energy conservation mode command and argues a person skilled in the art "would have included *such* energy conservation mode messages" in the system of Oinonen, Whitley, and Coon. Pet. 40 (emphasis added). Petitioner's use of "such" indicates its proposed combination modifies Oinonen, Whitley, and Coon to send Ehlers' command to join a utility's power saving program. But, as described above, that command is sent to utility control system 1.12 rather than to an environmental device's gateway 1.10 (base unit) as required by claims 2, 9, and 11. *See* Dec. Inst. 33–34.

Second, although our rules allow "the petitioner, in its reply brief, to address issues discussed in the institution decision," they prohibit Petitioner from "submit[ting] new evidence or argument in reply that it could have presented earlier, e.g., to make out a prima facie case of unpatentability." Consolidated Trial Practice Guide[10] at 73; *see also* 84 Fed. Reg. 64,280 (Nov. 21, 2019). Petitioner never argued in the Petition that Oinonen, Whitley, and Coon could be modified to include Ehlers' occupancy mode command to meet the limitations of claims 2, 9, and 11. *See* Pet. 40, 43. Petitioner's Reply is not an opportunity to present that argument for the first time. *See* Consolidated Trial Practice Guide at 73; *see also Ariosa Diagnostics v. Verinata Health, Inc*., 805 F.3d 1359, 1368 (Fed. Cir. 2015) ("The Board must make judgments about whether a Petition identified the

[10] Available at http://www.uspto.gov/TrialPracticeGuideConsolidated

specific evidence relied on in a Reply and when a Reply contention crosses the line from the responsive to the new."). Therefore, we do not consider this argument.

Accordingly, on this record and for the reasons stated above, Petitioner has failed to demonstrate that claims 2, 9, and 11 are unpatentable over the combination of Oinonen, Whitley, Coon, and Ehlers.

4. Claims 3, 15, 18, 19, and 21

Petitioner also relies on Ehlers to teach the additional limitations recited in claims 3, 15, 18, 19, and 21. *See* Pet. 40–45. Patent Owner contends Petitioner's analysis of these claims is deficient for the same reasons as Petitioner's analysis of claim 1. *See* PO Resp. 42. We are not persuaded by Patent Owner's arguments for the reasons discussed in §§ II.C.4 and II.C.5, *supra*. Moreover, we find Petitioner demonstrates by a preponderance of evidence how the combination of Oinonen, Whitley, Coon, and Ehlers teaches all the limitations recited in claims 3, 15, 18, 19, and 21 for the reasons stated in the Petition as briefly discussed below.

Claim 3 requires the command to be associated with an icon on the remote unit, and claim 21 requires the command to be initiated by a user interacting with the icon. Ex. 1001, 14:31–32, 15:17–20. Petitioner demonstrates how Ehlers teaches a user can send commands to control a thermostat using a mobile phone by interacting with icons on a GUI displayed on the mobile phone. Pet. 40–43, 45 (citing Ex. 1020 ¶¶ 311, 316, Fig. 4C). Claim 15 requires the base unit and environmental device to be contained in the same enclosure. Ex. 1001, 15:1–2. Petitioner demonstrates how Ehlers teaches integrating gateway 1.10 (base unit) and controlled device 1.08 (environmental device). Pet. 43 (quoting Ex. 1020 ¶ 68). Claims 18 and 19 require the base unit to receive data from a web service

and to send the control instruction responsive to receiving that data, and claim 19 further requires the web service to be a weather service. Ex. 1001, 15:8–13. Petitioner demonstrates how Ehlers teaches gateway 1.10 (base unit) can receive "external information . . . such as information related to the local weather forecast" via a web-browser and use that information together with indoor temperature measurements to control smart thermostat 1.08 (environmental device). Pet. 43–45 (citing Ex. 1020 ¶ 84, 88, 99, 115–116, 230–231, Fig. 1B).

For the reasons discussed above, Petitioner demonstrates by a preponderance of evidence that a person skilled in the art would have had a rational reason to combine the teachings of Oinonen, Whitley, Coon, and Ehlers, and that the combination teaches all the limitations of claims 3, 15, 18, 19, and 21. Accordingly, Petitioner has demonstrated that claims 3, 15, 18, 19, and 21 are unpatentable over the combination of Oinonen, Whitley, Coon, and Ehlers.

E. Obviousness over Oinonen, Whitley, and Lincoln

Petitioner argues claim 24 is unpatentable as obvious over Oinonen, Whitley, and either Denis or Lincoln. Pet. 45–51. Patent Owner disagrees. PO Resp. 44–52. For the reasons discussed below, we find Petitioner demonstrates by a preponderance of evidence that claim 24 is unpatentable over Oinonen, Whitley, and Lincoln. Accordingly, we need not consider whether Petitioner has also demonstrated that claim 24 is unpatentable over Oinonen, Whitley, and Denis. *See Beloit Corp. v. Valmet Oy*, 742 F.2d 1421, 1423 (Fed. Cir. 1984) (finding an administrative agency is at liberty to reach a decision based on a single dispositive issue).

1. Lincoln

Lincoln discloses a system having a controller and a plurality of remote devices that receive information from and send information to the controller in order to optimize and control systems such as HVAC, lighting, security, energy management, home automation, or home entertainment systems. Ex. 1022, 1:66–2:3, 2:20–29. The controller can identify particular users and resolve conflicting commands among identified users based on a priority listing programmed into the system. *Id.* at 22:4–5, 22:10–12.

2. Reasons to Combine the Teachings of Oinonen, Whitley, and Lincoln

Petitioner argues that although Oinonen and Whitley do not specifically disclose supporting multiple users, a person skilled in the art "would have known that Oinonen and Whitley disclose support for processing multiple messages from multiple users." Pet. 48–49 (citing Ex. 1003 ¶¶ 412–415). According to Dr. Jeffay, this is so because "most control systems . . . are capable of supporting multiple users" and most homes "have more than one occupant." Ex. 1003 ¶¶ 413–414. Therefore, a person skilled in the art would have sought out details from the prior art, such as the details provided by Lincoln, for processing commands received from multiple users. *Id.* ¶¶ 413, 415. Moreover, a person skilled in the art would have found it obvious to apply Lincoln's method for prioritizing commands from multiple users in the system of Oinonen and Whitley because doing so would have ensured, e.g., that parents rather than children had control over devices such as thermostats. Pet. 49. Patent Owner does not dispute this reasoning. *See* PO Resp. 46–52.

Petitioner demonstrates sufficient reasoning to combine the teachings of Oinonen, Whitley, and Lincoln. Oinonen and Whitley teach using a

remote unit (mobile phone) to monitor and control an environmental device. Ex. 1016, 6:64–7:4; Ex. 1019 ¶ 16; Ex. 1023, 6:22–29. Dr. Jeffay provides unrebutted testimony that a person skilled in the art "would have recognized that accommodating multiple users would have been an obvious and well-known modification to the systems of Oinonen and Whitley." Ex. 1003 ¶ 413. Lincoln teaches a method that allows multiple users to control an environmental device by resolving user control conflicts based on user priority. Ex. 1022, 22:4–6, 22:10–12. Thus, Petitioner's proposed combination is one of "familiar elements according to known methods" to yield predicable results. *KSR*, 550 U.S. at 416.

3. Claim 24

Independent claim 24 is similar to independent claim 1. *Compare* Ex. 1001, 13:57–14:20, *with id.* at 15:27–16:17. Both claims are directed to a base unit that is configured to receive environmental information from an environmental device, send a first message containing the environmental information to a remote unit, and receive a second message from the remote unit that includes a command. *Id.* Both claims also require the base unit to include a microcontroller configured to process the second message and send control instructions to the environmental device. *Id.* Claim 24 differs from claim 1 in that it does not require the remote unit to determine its position or whether it is outside a geo-fence, but does require the base unit to send a third message to a subordinate remote unit and receive a fourth message from the subordinate remote unit containing a subordinate command. *Id.* at 16:18–24. Claim 24 further differs from claim 1 in that it requires the microcontroller to process the fourth message and to send selectively a second control instruction to the environmental device. *Id.* at 16:24–29.

Notwithstanding Patent Owner's arguments to the contrary, discussed *infra*, Petitioner demonstrates how the combination of Oinonen, Whitley, and Lincoln teaches or suggests all the limitations recited in claim 24. *See* Pet. 49–50. Relying on its analysis of claim 1, Petitioner first demonstrates how the combination teaches the limitations in claim 24 that are similar to the limitations in claim 1. *See id.* at 49. We are persuaded by this analysis for the reasons discussed in § II.C.5, *supra*. Relying on the unrebutted testimony of Dr. Jeffay, Petitioner also demonstrates how a person skilled in the art would have known the combination could have sent/received both first/second and third/fourth messages to/from the remote units of different users. *Id.* at 50 (citing Ex. 1003 ¶¶ 418–420; Ex. 1022, code (57), 1:61–63, 10:50–57). For example, Lincoln teaches a system having a plurality of remote units that receive information from and send control information to an HVAC system. Ex. 1022, code (57), 1:66–2:3, 9:51–57, 10:51–57. Lastly, relying on the testimony of Dr. Jeffay, Petitioner demonstrates how a person skilled in the art would have known the combination would have included a microcontroller to "process additional messages as described in Oinonen and Whitley according to the priority rules that were well-known in the art, as evidenced by Lincoln." Pet. 50–51 (citing Ex. 1003 ¶ 423; Ex. 1022, 22:3–12). For example, Lincoln's controller "identifies particular individuals" and selectively activates "home appliances based on the information stored in the controller," including by resolving "[c]onflicts between individuals . . . based on a priority listing programmed in the system." Ex. 1022, 22:3–12.

Patent Owner argues Petitioner's analysis of claim 24 is erroneous for several reasons. *See* PO Resp. 22–27, 46–52. First, Patent Owner argues Petitioner has failed to provide sufficient motivation to combine the

teachings of Oinonen and Whitley. *Id.* at 22–26. We are not persuaded by this argument for the reasons discussed in § II.C.4, *supra*. Second, Patent Owner argues the proposed combination fails to disclose a microcontroller. *Id.* at 46. We are not persuaded by this argument for the reasons discussed in § II.C.5, *supra*.

Third, Patent Owner argues the proposed combination fails to disclose a "subordinate remote unit." *Id.* at 46–48. Specifically, Patent Owner argues that although Petitioner asserts "it would have been obvious to modify Oinonen and Whitley to allow multiple users, Petitioner does not assert that Oinonen or Whitley teaches or renders obvious the recited *subordinate* remote unit" and does not argue that "Lincoln discloses a subordinate remote unit." *Id.* at 46–47. Petitioner replies "[t]he term 'subordinate' does not appear in the specification, and therefore the plain and ordinary meaning of this term should be adopted." Pet. Reply 20. Petitioner argues "a device or message can be subordinate in many ways, including based on priority," and "Lincoln discloses a priority distinction." *Id.*

We agree with Petitioner. The Specification of the '655 patent does not expressly refer to a "subordinate remote unit." Nonetheless, it discloses that when "multiple remote control units 12 . . . are deployed, one of the remote control units could be considered a master and all others could be considered slaves" such that for certain operations the "base control unit 16 may be configured . . . to only respond to commands from the master remote control unit." Ex. 1001, 8:14–20. The Specification further discloses:

> the remote control units can be segregated into classes such that the base control unit responds to commands and communicates selected information to a class containing one or more remote control units. An example would be a first class consisting of

> remote control units operated by parents and a second class consisting of remote control units operated by children. . . . The class assignments and configurations are easily customized to provide the notifications desired by the authoritative system operators, in this case, the parents.

Id. at 8:20–36. Given these disclosures, we conclude the term "subordinate remote unit" includes a remote unit that is a slave to a master remote unit and a remote unit that is operated by lower priority (i.e., lower class) user. Lincoln discloses an environmental controller that is controlled by a plurality of remote units associated with identifiable users. *See* Ex. 1022, 1:66–2:3, 22:3–5 ("the controller identifies particular individuals using an IR, RF, or light source [that] communicate[s] with a sensor in [a] room"). The controller also prioritizes users based on "a priority listing programmed in the system." *Id.* at 22:10–12. Thus, as Petitioner contends, the combination of Oinonen, Whitley, and Lincoln teaches a system in which an environmental device is controlled by a base unit that interacts with a plurality of remote units, some of which have been classified as "subordinate remote units" based on a classification of the users associated with the remote units.

Fourth, and lastly, Patent Owner argues the proposed combination fails to disclose a subordinate remote unit sending a "subordinate command." *See* PO Resp. 48–52. Specifically, Patent Owner argues "[n]either Oinonen nor Whitley . . . discloses receiving inputs from multiple remote units" and Lincoln does not disclose controlling an environmental device based on receiving "any command from the user" and "certainly does not disclose receiving a subordinate command." *Id.* at 49–50. Petitioner replies that because Lincoln discloses settling "[c]onflicts between individuals . . . based upon a priority listing programmed in the system," it

follows that "a command from [lower priority] user two is a subordinate command whereas a command from [higher priority] user one is a non-subordinate command." Pet. Reply 20 (quoting Ex. 1022, 22:10–12) (emphasis omitted).

We agree with Petitioner. As discussed above, Petitioner demonstrates how the combined teachings of Oinonen, Whitley, and Lincoln teach sending a third message to a subordinate remote unit and receiving a fourth message containing a subordinate command from the subordinate remote unit. *See* Pet. 48–51. For example, Petitioner demonstrates that it would have been obvious for Oinonen and Whitley, both of which disclose controlling heating or HVAC systems, to "accommodat[e] multiple users." *Id.* at 48 (citing Ex. 1003 ¶¶ 413–414). This is because "most homes have more than one occupant." Ex. 1003 ¶ 414. Petitioner further demonstrates that it would have been obvious to use Lincoln's priority scheme to "manag[e] a system with multiple users" that is receiving conflicting commands from those users. *Id.* at 49 (citing Ex. 1003 ¶¶ 413–415). This is because "each user in the same house may have different environmental preferences" and "in homes with children . . . a parent would want to have priority of control over that of a child." Ex. 1003 ¶¶ 414–415.

Patent Owner does not address Petitioner's proposed combination or reasoning for making the combination. Instead, Patent Owner attacks the individual teachings of Oinonen, Whitley, and Lincoln, arguing the combination does not teach the "subordinate remote unit" or "subordinate command" limitations because Oinonen and Whitley do not teach "the recited *subordinate* remote unit" and Lincoln does not teach a subordinate remote unit that "sends a subordinate command." PO Resp. 47. But "[n]on-obviousness cannot be established by attacking references individually

where the [challenge] is based upon the teachings of a combination of references." *In re Merck & Co.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986).

For the reasons discussed above, Petitioner demonstrates by a preponderance of evidence that a person skilled in the art would have had a rational reason to combine the teachings of Oinonen, Whitley, and Lincoln, and that the combination teaches all the limitations of claim 24. Accordingly, Petitioner has demonstrated that claim 24 is unpatentable over the combination of Oinonen, Whitley, and Lincoln.

F. Obviousness over Bielski and Wu

Petitioner argues claims 1, 3, 5–8, 10, 12–17, and 20–23 are unpatentable over Bielski, Wu, and Coon; claims 2, 9, 11, 18, and 19 are unpatentable over Bielski, Wu, Coon, and Ehlers; claim 4 is unpatentable over Bielski, Wu, Coon, and Whitley; and claim 24 is unpatentable over Bielski, Wu, and either Denis or Lincoln. Pet. 51–80. Patent Owner disputes this. PO Resp. 52–65.

For the reasons discussed above, Petitioner has demonstrated by a preponderance of evidence that claims 1, 3–8, 10, and 12–24 of the '655 patent are unpatentable over Oinonen, Whitley, and Coon, alone or in combination with Ehlers or Lincoln. *See* §§ II.C–II.E, *supra*. Consequently, we need not consider whether Petitioner has also demonstrated that claims 1, 3–8, 10, and 12–24 are unpatentable over Bielski, Wu, and Coon alone, or in combination with Ehlers or Lincoln. *See Beloit*, 742 F.2d at 1423 (finding an administrative agency is at liberty to reach a decision based on a single dispositive issue). However, on the record presented and for the reasons discussed above, Petitioner has failed to demonstrate that claims 2, 9, and 11 are unpatentable over Oinonen, Whitley, Coon, and Ehlers. Therefore, we

do need to consider whether Petitioner has demonstrated that claims 2, 9, and 11 are unpatentable over Bielski, Wu, Coon, and Ehlers.

1. Bielski

Bielski discloses "a communication system and a method for . . . the monitoring, control and/or regulation of one or more devices." Ex. 1017 ¶ 1. Bielski allows "the user of a mobile phone[] to monitor devices . . . over long distances, and/or to actively control or regulate them by means of the mobile terminal." *Id.* ¶ 8. Bielski identifies each of "a stove, a refrigerator, a fuse box, a light, a roller blind, a garage door, [and] an alarm system of a video surveillance system," as a device that can be remotely monitored and controlled. *Id.* Bielski's system is illustrated in Figure 1, which is reproduced below.

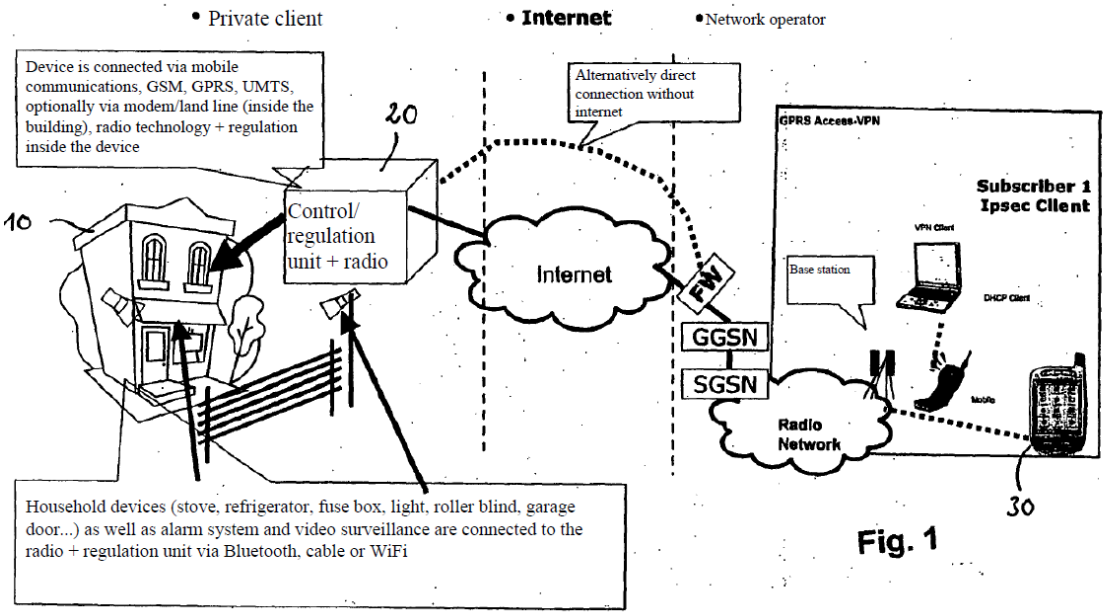

Figure 1 of Bielski is a schematic illustration of a system for "the monitoring, control, or regulation of household devices by means of a mobile terminal." *Id.* ¶ 53. The system includes monitored/controlled devices 10, check and communication unit 20, and mobile device 30. *Id.* ¶ 54, Fig. 1.

Check and communication unit 20 represents separate check and communication units that are "wired together for purposes of data exchange." *Id.* ¶ 54. The check unit can be "a monitoring unit which receives data from the device(s)," and also "a control unit which transfers data for the purpose of control to the one or more devices." *Id.* ¶ 14; *see also id*. ¶¶ 5, 40. The check unit communicates with the controlled devices over a wired or wireless connection. *Id.* ¶¶ 5, 13, 40. The communication unit includes a "sending and/or receiving unit by means of which data can be sent and/or received by mobile communications . . . according to the GSM, GPRS, or UMTS standard." *Id.* ¶ 57; *see also id*. ¶¶ 5, 21, 22, 26, 40.

Mobile terminal 30 can also operate according to the GSM, GPRS, or UMTS standards. *Id.* ¶ 30. Users of "mobile terminal 30 can be informed about the operation conditions of the devices . . . or can themselves influence the devices by controlling or regulating them." *Id.* ¶ 63. For example, users can enter "commands, such as on/off conditions or temperatures . . . into the mobile terminal and send this information. . . . to the control and communication unit 20 via the telecommunications network." *Id.* From control and communication unit 20, an issued command "is transmitted to the devices inside the building 10 or serves as a nominal value which is required for regulation of the devices." *Id.* Mobile terminal 30 can execute "an application with a corresponding user interface with which the user can . . . activate special features using buttons and various control panels . . . for the control/regulation unit" of a controlled device. *Id.* ¶ 81. The application allows, for example, the user "to specify a room temperature with a slider inserted onto the user interface, wherein the exact temperature values would be shown on a separate display, and the user . . . moves the slider to a desired value." *Id.* A corresponding application on check and

communication unit 20 "effect[s] control and regulation processes in the direction of the controlling/regulation devices." *Id.* ¶ 82.

Bielski's system includes "means [i] by means of which data can be transferred from the network operator to the mobile terminal on the basis of the data transferred from the communication unit . . . and/or [ii] by means of which data can be transferred from the mobile terminal to the network operator on the basis of which data are transferred to the communication unit." *Id.* ¶ 5. Bielski further discloses the means by which the mobile terminal can be informed about the status of monitored/controlled devices 10 can "be in the form of an SMS or by means of a voice mail." *Id.* ¶ 69.

2. Wu

Wu discloses "a Home Network System (HNS) architecture integrated with . . . Short Message Service to support the connectivity between the home and Internet/Global System for Mobile Communication (GSM) networks." Ex. 1018, 493. "The main objective of the integrated system is to remotely monitor and control the devices in the HNS via laptop computer or a GSM mobile terminal." *Id.* Wu's HNS is depicted in Figure 1, which is reproduced below.

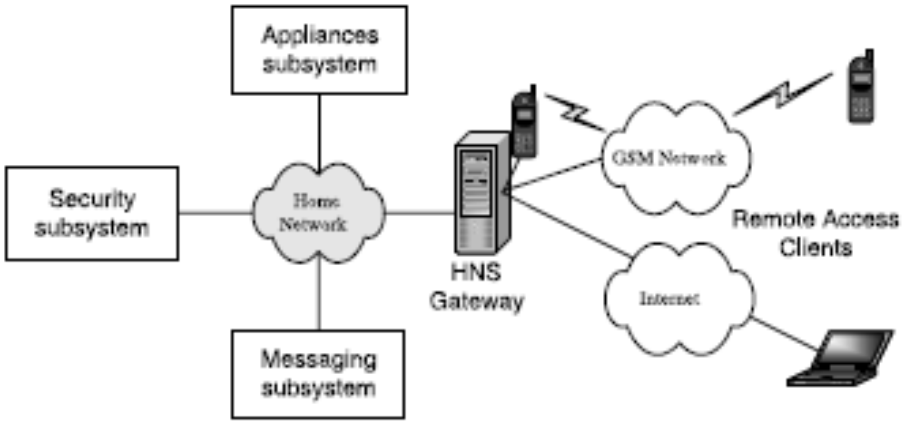

Fig. 1. Home network system architecture.

Figure 1 of Wu is a schematic illustration of a Home Network System. *Id.* at 494–495. The system includes an HNS gateway that "connects to home devices and runs a home automation management application that supervises home devices." *Id.* at 494. Home network devices, such as refrigerators, air-conditioners, televisions, surveillance systems, burglar alarm systems, fax and answering machines, are organized into appliance, security, and messaging subsystems. *Id.* at 494–495 (Table 1).

Wu's HNS allows remote users "to monitor home appliances and control them" from either a mobile terminal executing WAP (wireless access protocol) or SMS, or a computer executing HTTP (hypertext transfer protocol). *Id.* at 495. This is shown in Figure 2 of Wu, which is reproduced below.

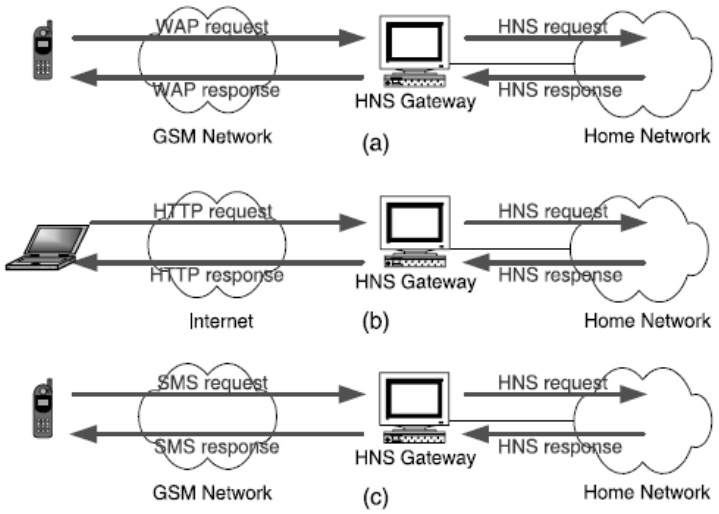

Fig. 2. Communication with the HNS in (a) WAP and (b) HTTP (c) SMS.

Figure 2 of Wu is a schematic illustration of three methods for communicating with home devices from a remote location, including via (a) WAP, (b) HTTP, and (c) SMS. *Id.*

3. Claims 2, 9 and 11

Claim 1 requires a base unit configured to receive from a cellular remote unit a second message containing a command for an environmental device, and a microprocessor in the base unit configured to process the second message and send *a control instruction based on the command* to the environmental device. *See* Ex. 1001, 13:57–14:15. Claim 2 depends from claim 1, and requires the command sent by the remote unit in the second message to concern entering an energy conservation mode associated with multiple environmental devices. Ex. 1001, 14:27–30. Claim 9 depends from claim 1 and requires the command to be an energy conservation command associated with multiple environmental devices. *Id.* at 14:44–46. Claim 11 indirectly depends from claim 1 and requires the second message to include an energy conservation command associated with multiple environmental devices. *Id.* at 14:47–57.

Petitioner relies on Ehlers to teach the claim 2, 9, and 11 limitations in the Bielski, Wu, Coon, and Ehlers combination "for at least the reasons set out in Ground 1B" for the Oinonen, Whitley, Coon, and Ehlers combination. *See* Pet. 74–75. In our Institution Decision, we found Petitioner was unlikely to demonstrate the unpatentability of claims 2, 9, and 11 over Bielski, Wu, Coon, and Ehlers for the same reasons Petitioner was unlikely to demonstrate the unpatentability of these claims over Oinonen, Whitley, Coon, and Ehlers. *See* Dec. Inst. 57–58; *see also* § II.D.3, *supra*.

Patent Owner agrees with those preliminary findings, arguing "Petitioner[] fail[s] to establish that Ehlers discloses the additional recitations of claim 2, 9, or 11 for the reasons discussed regarding Ground 1B." PO Resp. 61–62. Petitioner argues Patent Owner ignores the disclosures of the Bielski and Wu combination and fundamentally

misunderstands the teaching of Ehlers. Pet. Reply 27. Petitioner argues the Bielski and Wu combination discloses the limitations of claim 1, and Ehlers "discloses a nearly identical system that is focused on reducing energy costs" that is deployed by utilities. *Id.* at 27–28. Additionally, Petitioner argues Ehlers discloses sending a command to enter an energy conservation mode by "send[ing] commands to set . . . occupancy modes" to multiple devices in order to conserve energy. *Id.* at 28–29 (citing Ex. 1020 ¶¶ 244, 319, 332, Figs. 4E, 4F). Patent Owner argues "the Board should decline to consider Petitioner['s] new theory regarding the additional recitations of claim 2, 9, and 11 as discussed regarding Ground 1B." PO Sur-Reply 25.

Upon consideration of the evidence and arguments presented, we find Petitioner has failed to demonstrate on this record that claims 2, 9, and 11 are unpatentable over Bielski, Wu, Coon, and Ehlers. First, the Petition fails to demonstrate the combination teaches the limitations required by these claims for the reasons stated in our Institution Decision. *See* Dec. Inst. 33–34, 57–58. We disagree with Petitioner's contention that the analysis in our Institution Decision, which Patent Owner has adopted, attacks the teachings of Ehlers separately instead of considering the combined teachings of Bielski, Wu, Coon, and Ehlers. The entire analysis of claim 2 in the Petition reads: "Ehlers discloses 'wherein the command regards entering an energy conservation mode, and wherein the energy conservation mode is associated with multiple devices' for at least the reasons set out in claim 2 in Ground 1B." Pet. 74. This analysis fails to explain how Bielski, Wu, Coon, and Ehlers would send an "energy conservation command" other than by sending Ehlers' command *to a utility* to join the utility's power saving program. As discussed above and in our Institution Decision, Ehlers' command to join a utility's power saving program is not sent to the base unit

of an environmental device as required by claims 2, 9, and 11. *See* Dec. Inst. 33–34; § II.D.3, *supra*.

Second, although our rules allow "the petitioner, in its reply brief, to address issues discussed in the institution decision," they prohibit Petitioner from "submit[ting] new evidence or argument in reply that it could have presented earlier, e.g., to make out a prima facie case of unpatentability." Consolidated Trial Practice Guide at 73. Petitioner never argued in the Petition that Bielski, Wu, and Coon could be modified to include Ehlers' occupancy mode command to meet the limitations of claims 2, 9, and 11. *See* Pet. 74–75. Petitioner's Reply is not an opportunity to present that argument for the first time. *See* Consolidated Trial Practice Guide at 73; *see also Ariosa Diagnostics*, 805 F.3d at 1368 ("The Board must make judgments about whether a Petition identified the specific evidence relied on in a Reply and when a Reply contention crosses the line from the responsive to the new."). Therefore, we do not consider this argument.

Accordingly, on this record and for the reasons stated above, Petitioner has failed to demonstrate that claims 2, 9, and 11 are unpatentable over the combination of Bielski, Wu, Coon, and Ehlers.

G. Constitutional Challenges

Patent Owner argues we should decline to find the claims of the '655 patent unpatentable on constitutional grounds. *See* PO Resp. 65–66. Specifically, Patent Owner argues "the Administrative Patent Judges ('APJs') presiding over the proceeding were unconstitutionally appointed" because the Federal Circuit determined APJs are not inferior officers of the United States in *Arthrex Inc. v. Smith & Nephew, Inc.*, 941 F.3d 1320 (Fed. Cir. 2019), *cert. granted sub nom. United States v. Arthrex, Inc.*, 2020 WL 6037206 (Oct. 13, 2020), and the Federal Circuit's remedy to render APJs

inferior officers failed to cure the constitutional defect in APJ appointments. *Id.*

We decline to consider Patent Owner's constitutional challenge because the Federal Circuit determined in *Arthrex* that "the appropriate remedy to the constitutional violation [in APJ appointments] is partial invalidation of the statutory limitations on the removal of APJs" and that this "severing [of] the restriction on removal of APJs renders them inferior rather than principal officers." *Arthrex*, 941 F.3d at 1388.

III. CONCLUSION

We have reviewed the Petition, Patent Owner Response, Petitioner Reply, and Patent Owner Sur-Reply. We have considered all of the evidence and arguments presented by Petitioner and Patent Owner, and have weighed and assessed the entirety of the evidence as a whole.

We find, on this record, Petitioner has demonstrated by a preponderance of evidence that claims 1, 3–8, 10, and 12–24 of the '655 patent are unpatentable, but has failed to demonstrate on this record by a preponderance of evidence that claims 2, 9, and 11 are unpatentable.[11]

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

Claims	35 U.S.C. §	Reference(s) /Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1, 4–8, 10, 12–14, 16, 17. 20, 22, 23	103(a)	Oinonen, Whitley, Coon	1, 4–8, 10, 12–14, 16, 17. 20, 22, 23	
2, 3, 9, 11, 15, 18, 19, 21	103(a)	Oinonen, Whitley, Coon, Ehlers	3, 15, 18, 19, 21	2, 9, 11
24	103(a)	Oinonen, Whitley, Coon, Lincoln	24	
2, 9, 11	103(a)	Bielski, Wu, Coon, Ehlers		2, 9, 11
Overall Outcome			1, 3–8, 10, 12–24	

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that claims 1, 3–8, 10, and 12–24 are unpatentable;

FURTHER ORDERED that Petitioner has failed to show on this record that claims 2, 9, and 11 are unpatentable under 35 U.S.C. § 103(a) over Oinonen, Whitley, Coon, and Ehlers;

FURTHER ORDERED that Petitioner has failed to show on this record that claims 2, 9, and 11 are unpatentable under 35 U.S.C. § 103(a) over Bielski, Wu, Coon, and Ehlers; and

FURTHER ORDERED that this Decision is final, and a party to this 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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